IBO 2018 Final Report

29th International Biology Olympiad

15-22 July 2018, Tehran, Iran

2018
Tehran, I.R.Iran

Ministry of Education

Youth Scholar Club

Tarbiat Modares University

University of Tehran

Shahid Beheshti University

Tehran Municipality

Iran's National Elites Foundation

Cultural Heritage, Handicrafts and Tourism Organization of Iran

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IBO2018
Final Report

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1. Preface

Preface

It was our pleasure to be your host during IBO 2018 in Tehran, the capital of Iran and the heart of the great Persian civilization.

Saman Hosseinkhani
Chairman of IBO2018

Exactly 20 years ago Iran joined IBO family and since then has been an active member of all past competitions. In the last year, our dreams came true and we were the host of 29th International Biology Olympiad.

For 2 years, before IBO 2018, my colleagues in the scientific and executive committees worked hard to prepare all required materials and equipment for practical tasks and design of theoretical questions. Three major Iranian universities including Tarbiat Modares University, University of Tehran and Shahid Beheshti University had major scientific contributions.

Although students were here for competition there is one thing beyond the competition, friendship. I'm sure our students started strong friendships in order to make the future scientific collaborative network.

I have to thank more than 200 scientific committee members, scientific assistants and organizers who have worked hard, day and night, in order to bring the dream of IBO 2018 into life.

About I.R. Iran

Iran, officially the Islamic Republic of Iran, is a country in Western Asia. With over 81 million inhabitants, Iran is the world's 18th most populous country. Its territory spans 1,648,195 km2 making it the 17th largest in the world. Iran is home to one of the world's oldest civilizations beginning with the formation of the Elamite kingdoms in the fourth millennium BCE. It was first unified by the Iranian Medes in the seventh century BCE, and reached its territorial height in the sixth century BCE under Cyrus the Great, whose Achaemenid Empire stretched from Eastern Europe to the Indus Valley, one of the largest empires in history. Iran's rich cultural legacy is reflected in part by its 22 UNESCO World Heritage sites, the third largest number in Asia and 11th largest in the world.

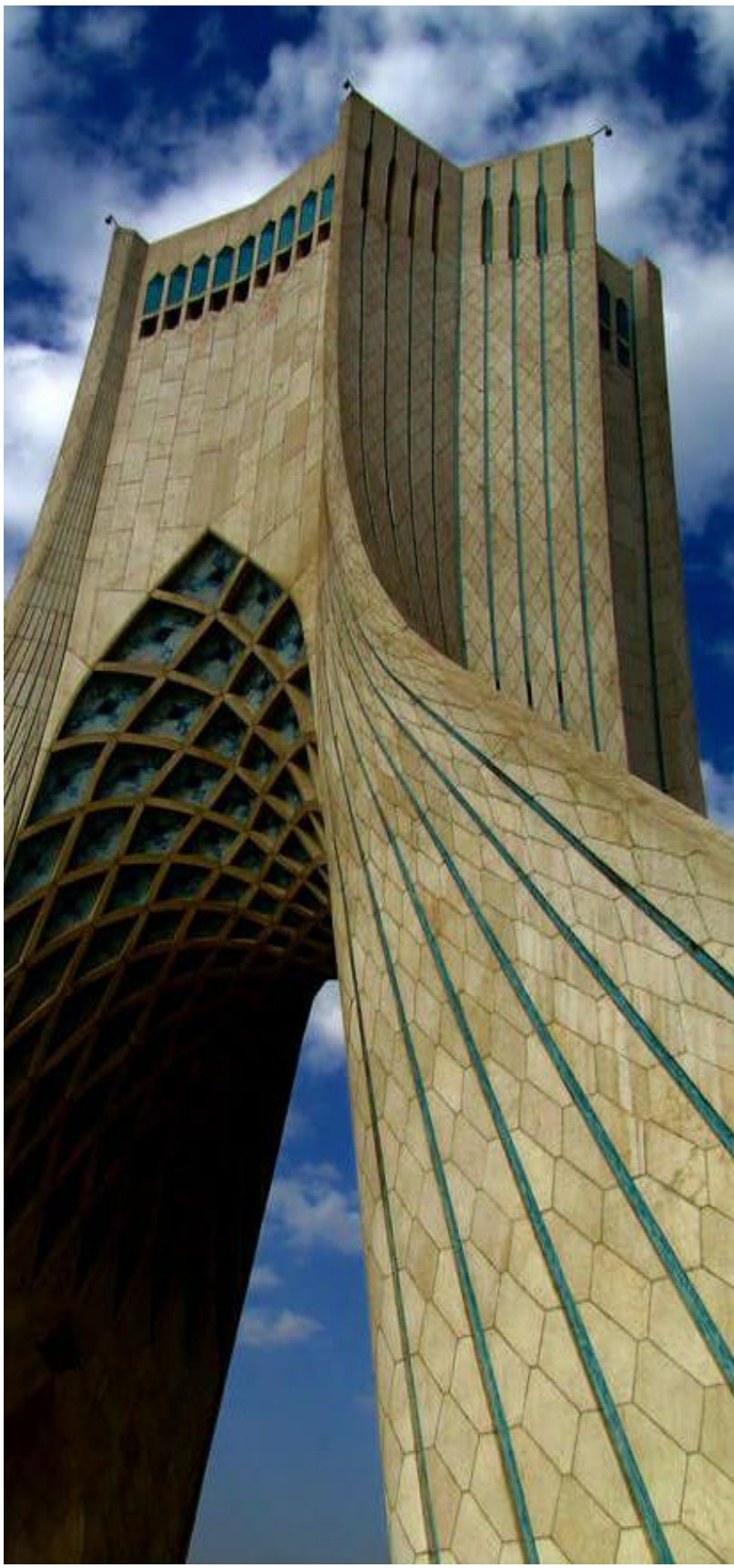
Iran's rich cultural legacy is reflected in part by its 22 UNESCO World Heritage sites

As a historically multi-ethnic country, Iran remains a pluralistic society comprising numerous ethnic, linguistic, and religious groups, the largest being Persians, Azeris, Kurds, Mazandaranis and Lurs.

Islamic Art & Architecture of a mosque, Isfahan, I.R. Iran

About Tehran

Tehran is the capital of Iran and Tehran Province. With a population of around 8.7 million in the city and 15 million in the larger metropolitan area of Greater Tehran, Tehran is the most populous city in Iran and Western Asia,and has the second-largest metropolitan area in the Middle East. Tehran is home to many historical collections, including the royal complexes of Golestan, Sa'dabad, and Niavaran, where the last two dynasties of the former Imperial State of Iran were seated. Tehran's most famous landmarks include the Azadi Tower, Milad Tower and The Tabiat Bridge.



About Tarbiat Modares University

Tarbiat Modares University is an exclusively graduate university with its main campus in Tehran, Iran. It was founded in 1982 and is consistently ranked among top universities in Iran. Tarbiat Modares University (TMU) is the only exclusively graduate university in Iran and was founded to train university professors. Admission is through national level university exams (i.e., Concours) and in most programs is limited to top performers.

TMU currently offers M.A/M.Sc. degrees in 171 academic programs and Ph.D. degrees in 132 academic programs, with more than 7300 and 3700 students in each level, respectively. At present, there are 17 faculties and 14 affiliated research centers in the university. The university enjoys the cooperation of more than 700 full-time academic members.

About University of Tehran

The University has 19,000 undergraduate and 13,000 graduate students. The University has 6 colleges with a total of 39 faculties and 120 departments at its 7 campuses located in the cities of Tehran, Qom and Karaj as well as its Kish International Campus (in Kish Island). The University of Tehran, as the main research University of the country, offers more than 300 post graduate programs.

Fifteen percent of Irans's centers of excellence, as recognized by the government, are located at the University of Tehran, which along with more than 40 research centers ensure UT's commitment to research. Together, over 3,500 laboratories are active in these centers and in the faculties. In addition, the University of Tehran publishes more than 50 scientific journals, some of which have the ISI index.

About Shahid Beheshti University

Shahid Beheshti University (SBU) is one of the most prestigious universities in Iran. Established in 1959, SBU combines the tradition of a classical university with the dynamic character of a modern and interdisciplinary scientific enterprise. Since 1990, the university has placed more emphasis on postgraduate, in particular, Ph.D., and research programs, while still aiming to enhance the quality of its well-established undergraduate courses. Students at the university are inspired by an outstanding and rewarding academic environment not only in Iran but in the region. The university and the members of the academia are at the forefront of world research in many fields, and the teaching is informed by the very latest developments in each discipline.

Shahid Beheshti University (SBU) is situated at the foothills of the Alborz Mountains, with a large, beautiful space and a rare landscape overlooking the big city of Tehran. SBU has attracted the attention of many of the top students in Iran. The graduates from SBU are engaged in high-level management positions in Iran and even abroad. SBU features the Center for Teaching Persian to Non-Persian Speakers, libraries with joint educational programs among other scientific centers of the world, dormitories as well as sport and welfare facilities. SBU provides the students interested in learning special skills for the job market with professional training.

At the present time, SBU has about 18,000 students, and among them, 300 are international from 20 countries. More than 200 international students are currently studying, while others are in the process of obtaining their final admission. SBU admits scholarship and non-scholarship candidates who are interested in studying in one of the university programs if they have the required scientific qualification.

2. 29th IBO at a Glance

2.1. Facts & Figures

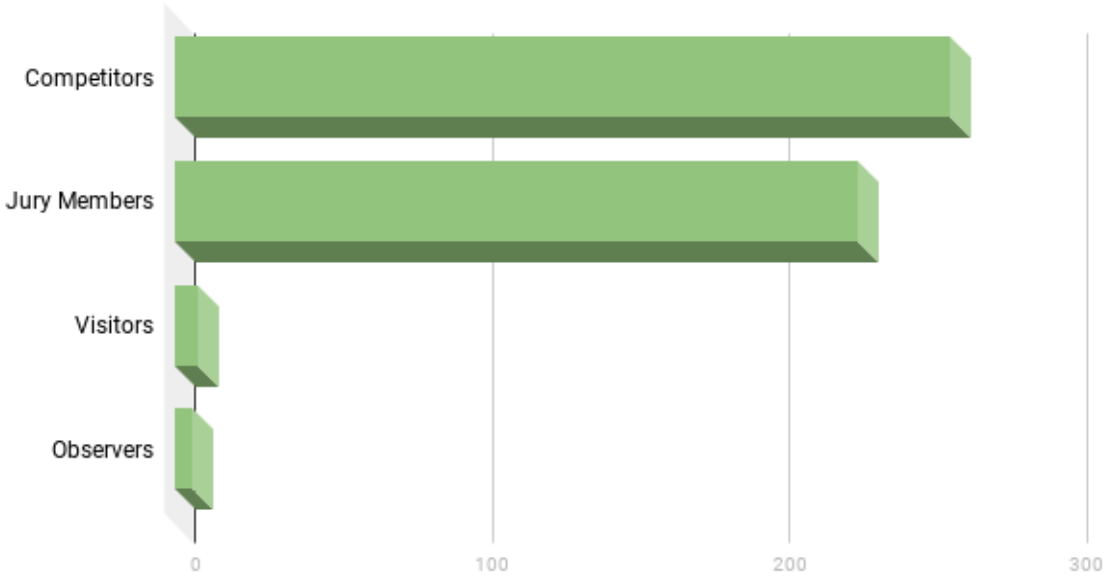
2.2. Exams

2.3. Students' Schedule

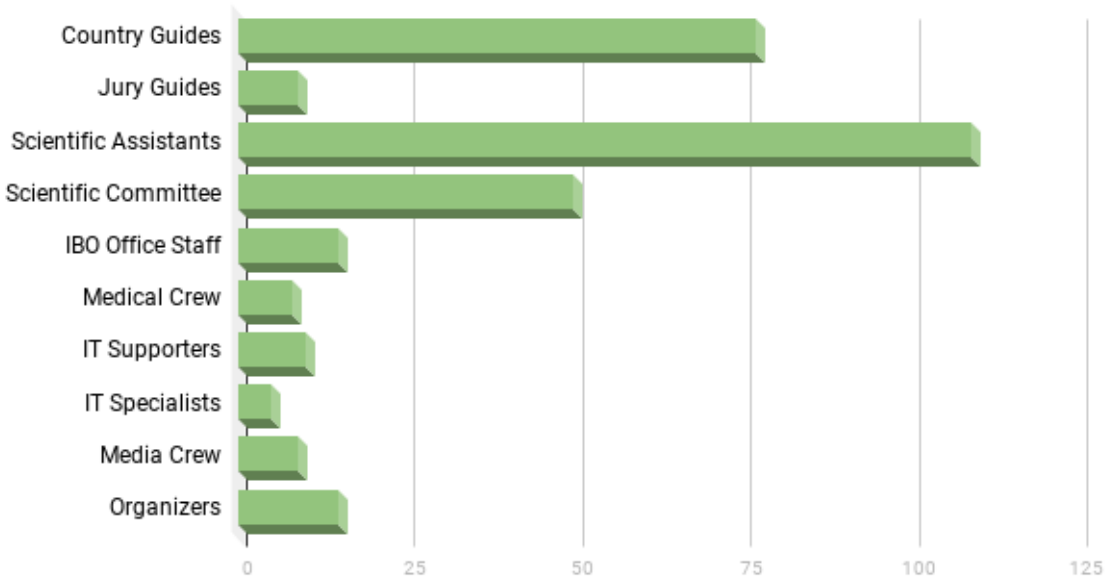
2.4. Jury's Schedule

Facts & Figures

Venue	Shahid Beheshti University, Tehran, Iran
Date	July 15-22, 2018
Budget	2,750,000 USD



Number of IBO 2018 Participants



Number of IBO 2018 Personnel

Exams

The competitors during IBO 2018 attended in two theoretical exams (each 3 hours) and four practical exams (each 90 minutes).
Theoretical exams tested students reasoning, calculation, data handling and creative thinking ability besides the biological basic knowledge. Practical exams examined competitors laboratory skills, time management and multitasking ability and less than theoretical exams, their biological knowledge.

Official English version of the exams were provided and juries translated the exams to the native language of the delegations.

Translation and discussion of the practical exams held on the second day of the IBO, while this process for theoretical exams took two days (third and fourth days).

Students' Schedule

Date	Student plan		
	Time	plan	location
Sun. July 15th	8:00 –15:00	Registration	Evin Hotel
	15:00	Bus Departure to Espinas Palace Hotel	
	16:30 – 18:30	Opening Ceremony	Espinas Palace Hotel
	19:00 – 22:00	Dinner & World cup Final	Espinas Palace Hotel
	22:00	Return to Hotel Evin	
Mon. July 16th	7:00 – 9:00	Breakfast	Evin Hotel
	9:30	Bus Departure to Excursion	
	10: 30 – 12:30	Excursion	
	12: 30	Bus Departure to Evin Hotel	
	13:30 – 14: 30	Lunch	Evin Hotel
	15:30 – 18:30	Review of Lab. Equipment	Evin Hotel
	19:00 – 20:00	Dinner	Evin Hotel
	20:00 – 22:00	Free Time + Ice Breakers	Evin Hotel
Tue. July 17th	6:00 – 7:30	Breakfast	Evin Hotel
	8:00	Bus Departure to SBU	
	9:00 – 10:30	Practical Exam 1	SBU
	10:30 – 11:30	Break	SBU
	11:30 – 13:00	Practical Exam 2	SBU
	13:00 – 14:00	Lunch	SBU
	14:00 – 15:30	Practical Exam 3	SBU
	15:30 – 16:30	Break	SBU
	16:30 – 18:30	Practical Exam 4	SBU
	18:30 – 21:00	Entertainment & Sport & Barbecue	SBU Campus
	21:30	Bus Departure to Evin Hotel	
Wed. July 18th	7:00 – 9:00	Breakfast	Evin Hotel
	9:00	Bus Departure to Excursion	
	9:30 – 12:00	Sightseeing / Shopping Mall	
	12:00	Bus Departure to Evin Hotel	
	12:30 – 13:30	Lunch	Evin Hotel
	14:00 – 17:00	Sightseeing / Shopping Mall	
	17:00	Bus Departure to Evin Hotel	
	18:00 – 19:00	Free Time	Evin Hotel
	19:30 – 21:00	Dinner	Evin Hotel
Thu. July 19th	6:00 – 8:00	Breakfast	Evin Hotel
	8:00	Bus Departure to SBU	
	9:00 – 12:30	Theoretical Exam (I)	SBU
	12:30 – 14:00	Lunch	SBU
	14:00 – 17:30	Theoretical Exam (2)	SBU
	18:00	Bus Departure to Tehran Night	
	19:00 – 21:00	Tehran Night	
	21:30	Bus Departure to Evin Hotel	
Fri. July 20th	7:00 – 8:00	Breakfast	Evin Hotel
	8:30	Bus Departure to Excursion	
	9:30 – 12:30	Excursion	
	13:00	Bus Departure to Evin Hotel	
	14:00 – 15:00	Lunch	Evin Hotel
	15:00 – 17:00	Free Time	Evin Hotel
	17:00	Bus Departure to SBU	
	17:30 – 22:00	Cultural Night/ Food & Music Festival	SBU Campus
	22:30	Bus Departure to Evin Hotel	
Sat. July 21st	7:00 – 8:00	Breakfast	Evin Hotel
	8:30	Bus Departure to Excursion	
	9:30 – 11:30	Excursion	
	12:00	Bus Departure to Evin Hotel	
	13:00 – 14:00	Lunch	Evin Hotel
	14:00 – 15:30	Free Time	Evin Hotel
	15:30	Bus Departure to Closing Ceremony	
	16:30 – 19:30	Closing Ceremony	
	19:30 – 21:00	Awards Dinner	
	22:00	Bus Departure to Evin Hotel	
Sun. July 22nd	7:00-9:00	Breakfast	Evin Hotel
	All Day	Checkout & Departures	

Juries' Schedule

Date	Jury plan		
	Time	plan	location
Sun. July 15th	8:00 –15:00	Registration	Azadi Hotel
	15:00	Bus Departure to Espinas Palace Hotel	
	16:30 – 18:30	Opening Ceremony	Espinas Palace Hotel
	19:00 – 22:00	Dinner & World cup Finale	Espinas Palace Hotel
	22:00	Bus Departure to Espinas Palace Hotel	
Mon. July 16th	7:00 – 8:30	Breakfast	Azadi Hotel
	8:30-12:00	Jury Session for Practical Exam	Azadi Hotel
	12: 00 – 14:00	Lunch	Azadi Hotel
	14:00 – 18:00	Jury Session for Practical Exam	Azadi Hotel
	18:00 –20:00	Dinner	Azadi Hotel
	20:00 – ?	Jury Session for Practical Exam	Azadi Hotel
Tue. July 17th	6:30 – 8:30	Breakfast	Azadi Hotel
	8:30-12:00	Jury Session for Practical Exam	Azadi Hotel
	12: 00 – 14:00	Lunch	Azadi Hotel
	14:00 – 18:00	Jury Session for Practical Exam	Azadi Hotel
	18:00 –20:00	Dinner	Azadi Hotel
	20:00 – ?	Jury Session for Practical Exam	Azadi Hotel

	Time	Plan	Location
Wed. July 18th	6:30 – 8:30	Breakfast	Azadi Hotel
	8:30-12:00	Jury Session for Theoretical Exam	Azadi Hotel
	12: 00 – 14:00	Lunch	Azadi Hotel
	14:00 – 18:00	Jury Session for Theoretical Exam	Azadi Hotel
	18:00 –20:00	Dinner	Azadi Hotel
	20:00 – ?	Jury Session for Theoretical Exam	Azadi Hotel
Thu. July 19th	7:00 – 8:00	Breakfast	Azadi Hotel
	8:00	Bus Departure to Excursion	
	9:00 – 12:00	Scientific Excursion	
	12:00	Bus Departure to Azadi Hotel	
	13:30-14:30	Lunch	Azadi Hotel
	15:00	Bus Departure to Excursion	
	15:30-18:00	Excursion	
	18:00	Bus Departure to Tehran Night	
	19:00 – 21:00	Tehran Night	
	18:00	Bus Departure to Azadi Hotel	

	Time	Plan	Location
Fri. July 20th	7:00 – 8:00	Breakfast	Azadi Hotel
	8:30	Bus Departure to Excursion	
	9:30 – 12:30	Excursion	
	13:00	Bus Departure to Azadi Hotel	
	14:00 – 15:00	Lunch	Azadi Hotel
	15:00 – 19:00	Jury Session for Results Review	Azadi Hotel
	19:30	Bus Departure to SBU	
	20:00 – 22:00	Cultural Night/ Food & Music Festival	SBU Campus
	22:30	Bus Departure to Azadi Hotel	
Sat. July 21st	7:00 – 8:00	Breakfast	Azadi Hotel
	9:00– 13:00	Final Approval of Scores	Azadi Hotel
	13:00 – 14:30	Lunch	Azadi Hotel
	14:00 – 15:30	Free Time	Azadi Hotel
	15:30	Bus Departure to Closing Ceremony	
	16:30 – 19:30	Closing Ceremony	
	19:30 – 21:00	Awards Dinner	
	22:00	Bus Departure to Azadi Hotel	
Sun. July 22nd	7:00-9:00	Breakfast	Azadi Hotel
	All Day	Checkout & Departures	

3. Organization


بیست و نهمین ال
جهانی زیست
دانشگاه
29th
International
Biology
Olympiad
15-22 July 2018,Tehran,Iran

History of IrBO and IBO in Iran

Aims

Iranian Biology Olympiad (IrBO) tries to challenge and stimulate gifted students to expand their talents and to promote their career as biologists. IrBO also is focusing on biology as a valuable subject. In offering a wider syllabus than Iranian National Biology Curriculum, it allows gifted students to demonstrate their theoretical knowledge and practical skills and be suitably rewarded and publicly recognized by the award of medals and certificates. IrBO also takes advantage of the opportunity provided by IBO to promote the syllabuses and educational trends in biology in different parts of the country.

Origins

IrBO was found in 1998, during the 9th IBO which was held in Kiel Germany. The first Iranian team participated in the 10th IBO held in Uppsala, Sweden in 1999, and since then Iranian students have participated in all past competitions.

Organization

IrBO is fully supported by The Ministry of Education, Iran. IrBO National committee is responsible for all theoretical and practical exams and the results. Each student will pass 4 rounds of examination during the national competitions prior to becoming a national IBO team member. IrBO

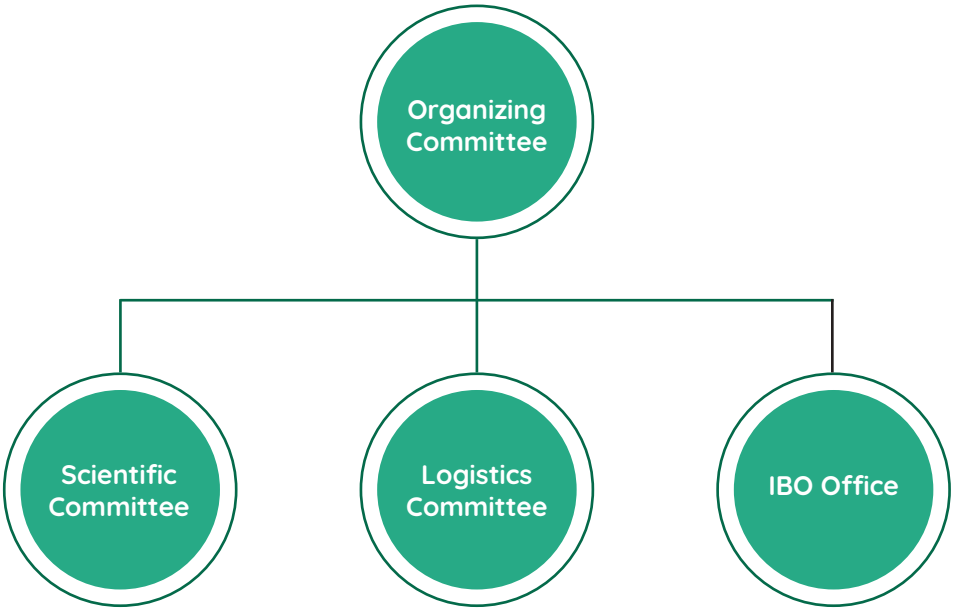
national committee comprised of university professors, biology teachers, experts in science education and previous national IBO team members.

Process

The National Center for Development of Gifted Students and Young Scholars, an organization in the body of the ministry of education, is the main and only organizer of 4 rounds of IrBO competition. The competition is countrywide. All Iranian students who are studying experimental sciences in one of the Iranian schools are eligible to participate in the competition.

Organizational Chart

29th IBO had a fairly large organizing committee. This stemmed from the enthusiasm of the volunteers wanting to help in organizing the event, The organization chart of the IBO 2019 is depicted in Figure 2.1.



Organizing Committee

There were three main national stakeholders in organizing the IBO; Ministry of Education, Youth Scholar Club and Shahid Beheshti University. Ministry of Education was the main sponsor of the event. Youth Scholar Club is the organization responsible for organizing national olympiads and selecting national team members. Also having the experience of organizing International Olympiad of Informatics (IOI) in 2017, making them the perfect

consultant on the matter. And last but not least, Shahid Beheshti University, the main host and organizing party of the event was another important stakeholder.

The organizing committee consisted of the representatives of these three stakeholders, updating each other on the matters at hand every 2-3 days until 2 months prior to the event. After that, they had regular daily updates via teleconferencing. Their main task was coordinating the activities of other committees and subcommittees and evaluating the progress of the project. Also, high stakes decisions were made by this committee.

Scientific Committee

The scientific committee of the 29th IBO was tasked with preparing the exams comparable to other IBOs. Also, quality assurance of exam questions was among the tasks delegated to this committee. This committee was comprised of high school biology teachers, university professors and experts on the field of science education. Also, previous IrBO medalists joined this committee to add more creativity to the practical & theoretical questions. Each of these groups had separate training workshops to bring them into speed about the 29th IBO scientific themes

and what were expected from the exams by the students and juries. The University of Tehran and Tarbiat Modares University were the main hosts for design, preparation, execution, and evaluation of practical tasks.

Each scientific team had its own dedicated task force:

- Biochemistry & Molecular Biology
- Plant Systematics, Anatomy & Physiology
- Animal Systematics, Anatomy & Physiology
- Evolution, Ecology & Behavior

Each task force had a three-layer organization, Figure 2.2.

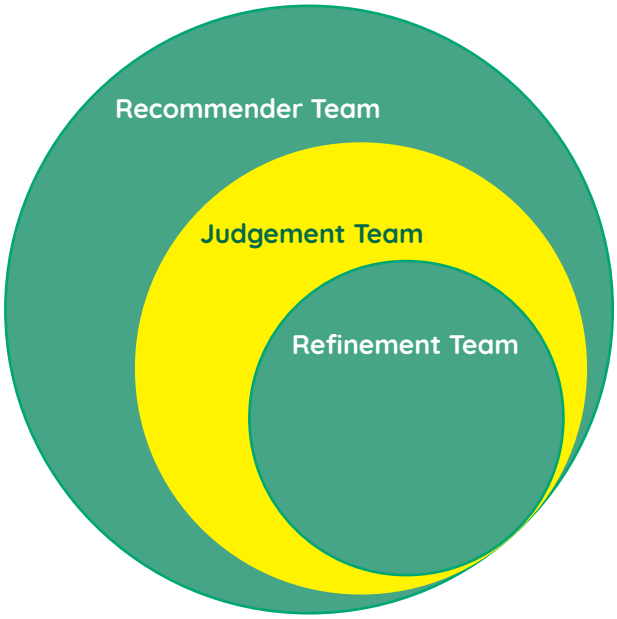


Figure 2.2

The Recommender Team designed questions based on their knowledge about scientific teams and their perception of the level of students participating from all around the world. They were asked to write their questions in Persian so that they can be properly interpreted by the Judgement Team. The outcome of the effort they made was a question bank of more than 500 theoretical questions and 15 different practical tasks.

Then this bank was handed out to the Judgement Team to filter the questions and select those suitable for an International Biology Olympiad. This team was comprised of previous national team members and jury members who had experienced such an exam.

And at last the questions were delivered to the Refinement Team who decided to combine multiple questions with the same concept and translated all the final questions and practical tasks into English.

Logistics Committee

The logistics committee was responsible for planning the trip of more than 600 IBO team members and their juries to Iran from the moment flight their flight landed to the moment it took off. Experts were recruited to create the best possible experience for our guests coming to Iran.

The logistics committee had to take care of the following tasks:
The logistics committee had to take care of the following tasks:

- Facilitating visa acquisition
- Transportation
- Accommodation of participants & jury members
- Curating ceremonies & leisure activities
- Procurement of hardware needed for exams
- Procurement of hardware needed for jury sessions

IBO Office

The IBO office was responsible for communicating with the participants and their jury members prior to their arrival. Also, they had to design and execute the process of selecting and training local team guides. During the event, they were responsible for resolving any problem by communicating between participants and jury members and the logistics committee.

They also had the following responsibilities:

- Selecting and training scientific assistants
- Organizing students during activities
- Creating daily newsletters
- Updating social media
- Designing the visual identity of the event

4. 29th IBO under the Microscope

Logo

The logo of the 29th IBO was designed with the following concepts in mind:

- Describing life as it is the primary definition of biology
- Having the ancient Persian symbols of biology
- Designating where the event was hosted

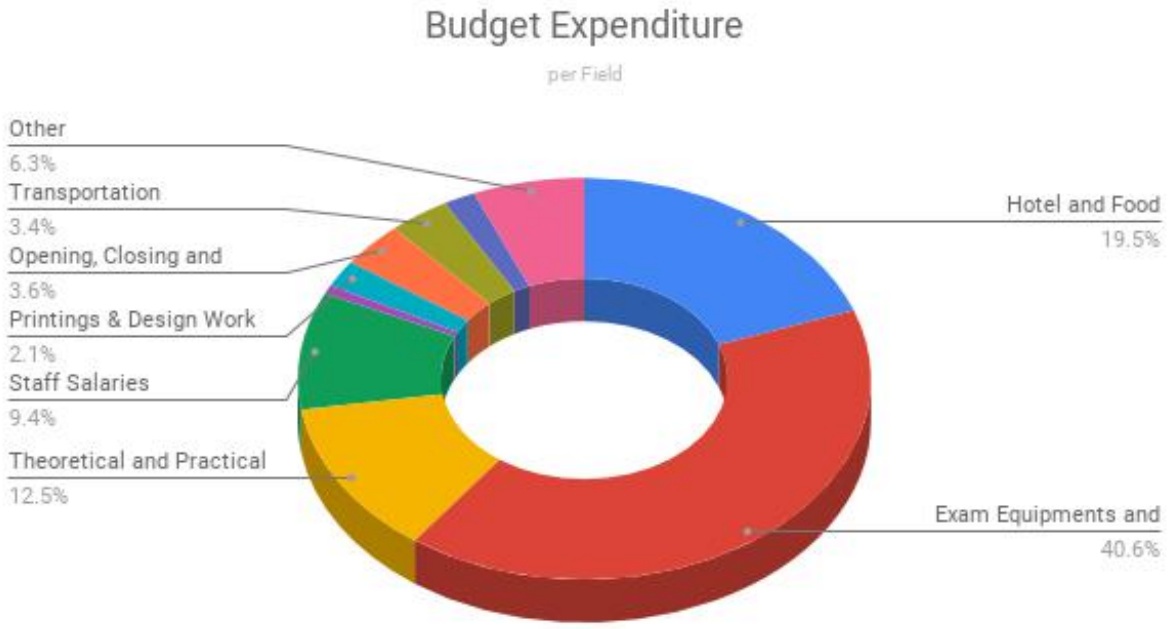
So the design process started and the logo was finalized in June 2017. The logo was comprised of three colors; red, white and green. Red is the symbol of the blood running through our veins. White is the symbol of peace and green symbolized the plants that make life possible on our planet. These colors are also the primary colors of the Islamic Republic of Iran's flag, the host country.

Two ancient biological elements were used in designing the logo. The lotus is a 12 petal flower which is widely used in carvings of Persepolis, the palace of Achaemenides, as a symbol of peace. There is also a Capra (a kind of wild goat) hidden in the white area between the green and red. Capra paintings were found in the ruins of the burnt city near the city of Zabol. The painting was from 3000 B.C. and was demonstrating the Capra foraging on plants in 4 continuous scenes. This is the first known stop-motion ever created by mankind.

This logo was used as the cornerstone of everything designed for the event, visual identity. From ID cards and gifts to the medals and certificates.

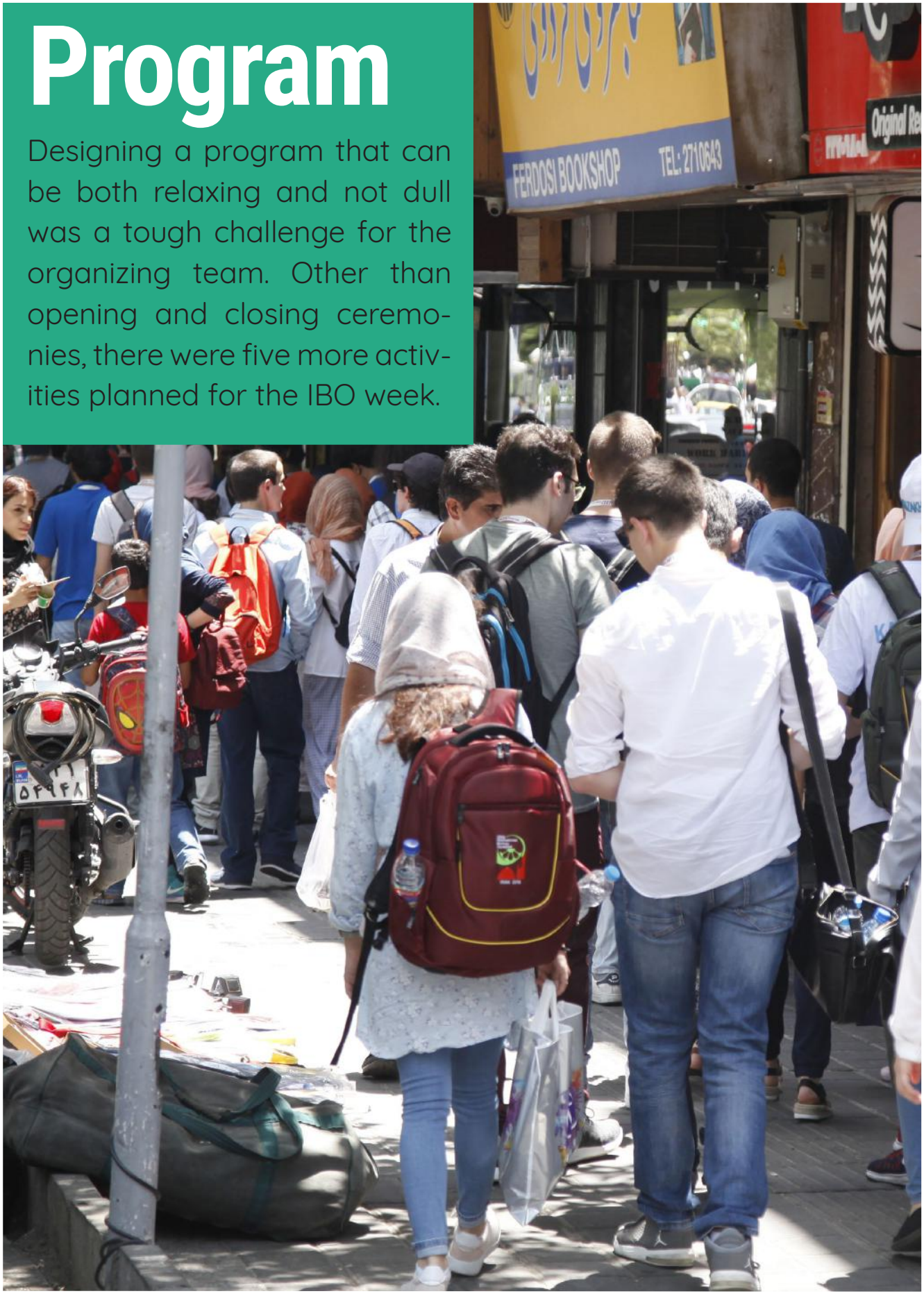
Budget & Expenditures

The main sponsor of the 29th IBO was Ministry of Education of the Islamic Republic of Iran. A total of 2,000,000 USD was originally secured in the national budget for organizing the IBO 2019. Although because of the sanctions and the inflation caused by it during the IBO, this fund had to be expanded by 490,000 USD. Also, a total of 261,000 USD were collected from the registration fees of the delegates(2,000 USD for 4 students & 2 jury members, 1,800 USD for each additional jury).Generous contributions from Tehran University and Tarbiat Modares University were provided through the process of developing and pilot execution of practical tasks. Also, Shahid Beheshti University provided most of the venues for students' examination and leisure activities. They also hosted the IBO office, the secretariat of the event, and its staff.



Program

Designing a program that can be both relaxing and not dull was a tough challenge for the organizing team. Other than opening and closing ceremonies, there were five more activities planned for the IBO week.



Ceremonies

Opening Ceremony

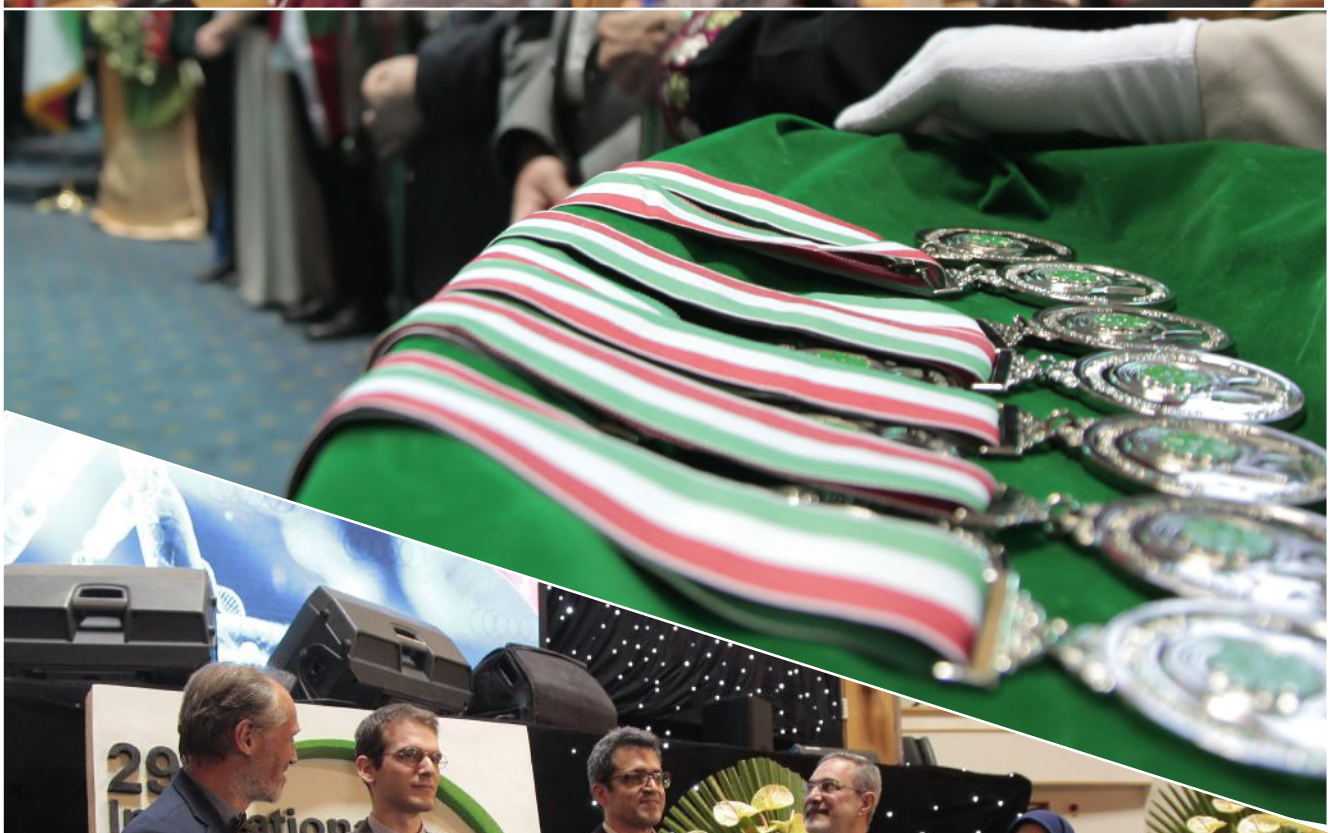
The opening ceremony was held at Espinas Palace Hotel, a luxurious 5-star hotel at the heights of Tehran with an overview of the whole city. Other than 250 participants and 300 jury members, more than 500 guests were invited to the ceremony in order to create a realistic concept over the magnitude and importance of the event. The then Minister of Education of the Islamic Republic of Iran, H.E. Mohammad Bathaei, delivered the welcome speech to the guests from all around the world.

In the opening ceremony, the participants and their jury members got to know the culture of different parts of Iran through music and theater. Also, each national team welcomed the crowd with their own culture and customs with their flags preceding them. After the ceremony, the guests were received by Persian cuisine.

Closing Ceremony

The closing ceremony was held at the Iran International Conference Center. In this ceremony, the participants watched the performance of the famous Persian singer, Salar Aghili. Also, the secretariat of the IBO 2018, Prof. Saman Hosseinkhani, said his remarks of the event. And at last, after lots of hard work and a week of though examination the participants were ranked and announced from bronze medal to gold medal.


تاجیکستان
Tajikistan




ایران
Iran

Leisure Activities

In the gap between the theoretical and practical exam, students had the chance to visit some sights of Tehran, e.g. Milad Tower, Tajrish Bazaar, Imamzadeh Saleh and Sa'dabad Complex. Also at the Evin Hotel, a game room was prepared for participants which were open until 4 am.

Milad Tower

Milad Tower, also known as the Tehran Tower, is a multi-purpose tower in Tehran. It is standing at 435 meters from the base to the tip of the antenna, which makes it the sixth-tallest telecom tower in the world. Participants went up to the open observation deck at a height of 275 meters. From there they had an overview of the whole city and the mountains in the north of Tehran.Education of the Islamic Republic of Iran, H.E. Mohammad Bathaei, delivered the welcome speech to the guests from all around the world.

Tajrish Bazaar

Tajrish Bazaar, in the heart of north Tehran, is a miniature of the Tehran Grand Bazaar which was built more than 150 years ago. It is home to merchants of every kind of food, electronics, clothes, gold and silver jewelry, religious artifacts, artwork and household goods, all next to each other, lit by a combination of incandescent

and daylight sneaking in through the roof. Participants had the chance to buy Persian souvenirs from saffron to sour fruit rolls.

Imamzadeh Saleh

Imamzadeh Saleh is located at Tajrish Square in Tehran's northern district. The mosque entombs the remains of Saleh, a son of the Twelver Shia Imam, Musa al-Kadhim, and is one of the most popular Shia shrines in northern Tehran. Participants could voluntarily go into the holy mosque and watch the Islamic architecture and mirror works.

Sa'dabad Complex

The Sa'dabad Palace Complex is a 300 hectare complex built by the Qajar and Pahlavi monarchs, in the north of Tehran. The complex includes more than 180 hectares of natural forest, streets, qanats, galleries, mansions/palaces and museums. Participants visited these museums and walked in the beautiful gardens of the complex.

Hotel Game-Room

At the Evin Hotel, a game room was prepared for participants to socialize and compete with others. They could play intuitive board games, electro air hockey, virtual reality games, and archery. Also, seven game-masters were recruited to facilitate the interaction and competition between participants.

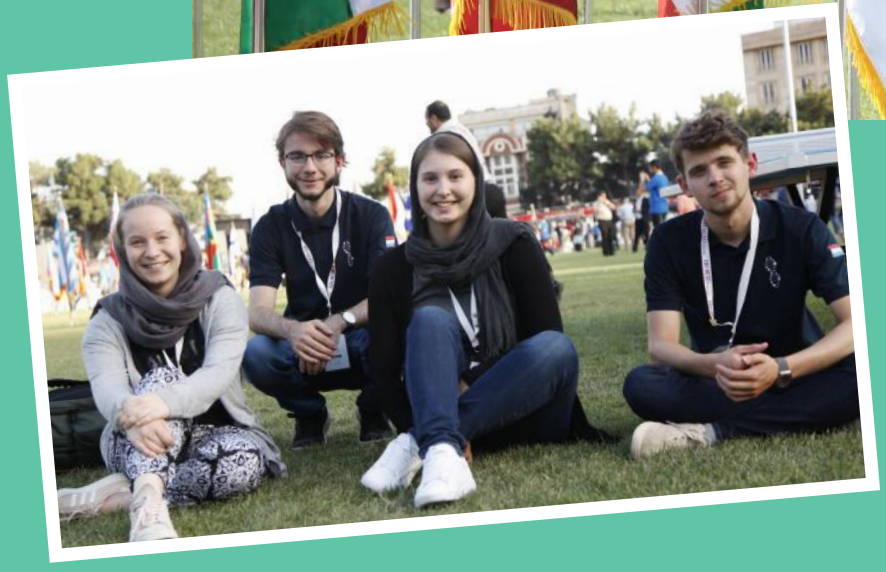
Evening Programs

After the practical exams, participants were taken to Shahid Beheshti University's soccer court. There they had the chance to chill off, playing ping-pong, giant volleyball, archery, foosball and of course eat Persian traditional food and fast-food and barbecues. At night the Persian acapella band, Vocapella, performed some of their international songs. And the night ended with spectacular fireworks. After the theoretical exam, participants joined with their juries in the same court and spent another memorable night.

Each participant & jury member was provided with a handicrafts coupon, which they could use in the exhibits around the court to buy souvenirs.


Barbecue
Hot Bread
Doner kebab
IBO 2018
Tehran- Iran


ORDEM E PROGRESSO




60 80 100 80 60 40 20


Rock Island
MOTORCYCLE
CUSTOM


IBO

Logistics

The organization of the event was assigned to experts from the ministry of foreign affairs and the presidential ceremonial unit. Having in mind that juries and participants had to be segregated because of exam security.

Students' Side

For accommodation of students and their guides, Evin Hotel, a 4-star hotel with a maximum capacity of 400 guests, was fully booked from 2017. The hotel had a two-story conference hall which was used for dining and student briefings. Also, practical equipment demonstration and delivery of electronics was conducted in rooms.

For dining, the menu was chosen in a manner to cover all tastes. Persian, Western and vegetarian food was prepared for every meal.

Another outdoor hall was used as a game room to help the participants, socialize and compete over virtual reality games (More on section 3.3.2).

For the first time, delivering and returning the participants electronics was based on the QR codes on students ID cards in order to make the process as robust as possible.

Juries' Side

Juries were accommodated at Azadi Hotel. This 5-star hotel is located in the 500-meter vicinity of Event Hotel, where the students were staying. This posed a challenge over unintended communication during the IBO week, so security guards of the hotel were asked to check the ID cards of the guests of the hotel.

Azadi Hotel

Azadi Hotel had a flat hall with a capacity of 250 persons, which was used as the jury hall. A private network was set up in order to handle all communications of juries with the translation software. Also, this network was used for remote printing via three wifi-connected industrial printers around the hall.


29th
International
Biology
Olympiad
15-22 July 2018,Tehran,Iran
IBO 2018
Tehran, Iran تهران، ایران
29th International Biology Olympiad
بیست و نهمین المپیاد جهانی زیست شناسی

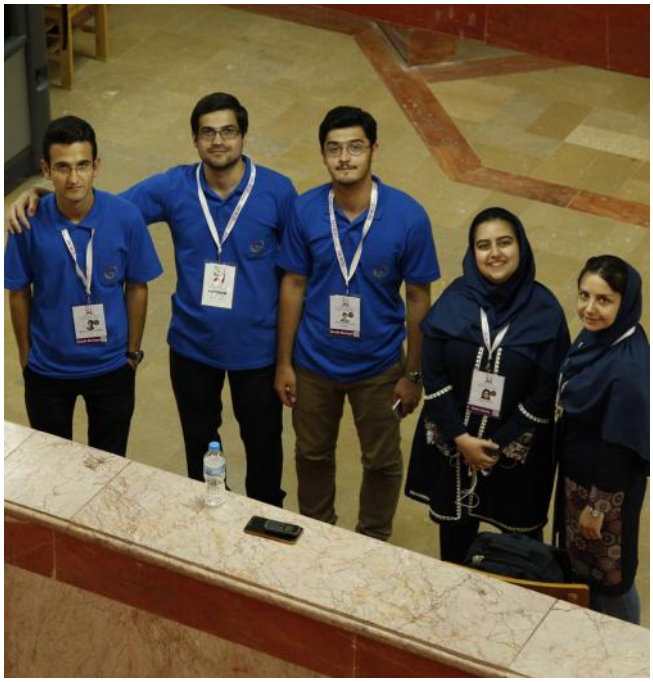
Guides

Around 300 young people requested to participate as a guide in IBO. These people were invited to a two-fold interview process. The IBO interview team evaluated them first, in terms of language ability, communication, and social skills. In the next step, successful candidates went through a simple psychological interview in which their personality was evaluated. Finally, the IBO interview team selected 84 candidates, all of which were at the age of 19 to 25 years old.

The selected candidates were divided into three groups of team guides, super guides, and Jury guides. At last, based on interview results, 68 were assigned as a team guide to 68 registered countries. Also, 9 candidates were selected as the super guides each of whom had to managed about 7 countries. They played the role

of immediate links between IBO Office and team guides and their competitors.

Furthermore, 7 jury guides were selected so that they could help IBO organizers with serving jury members and other team guests during all sessions and events in the IBO 2018.



68 Team Guides

9 Superguides

7 Jury Guides

Scientific Assistants

Preparation for practical exams started about one year before the IBO. In that period the majority of tasks and pilot designs were conducted by professors and former IrIBO medalists in the scientific committee. They also took part as senior scientific assistants in the preparation days before the practical exams at Shahid Beheshti University and later through the exams. Due to intensive workload in the process of lab preparation at Shahid Beheshti University, 41 lab assistants were recruited by IBO office from former IrBO medalists.

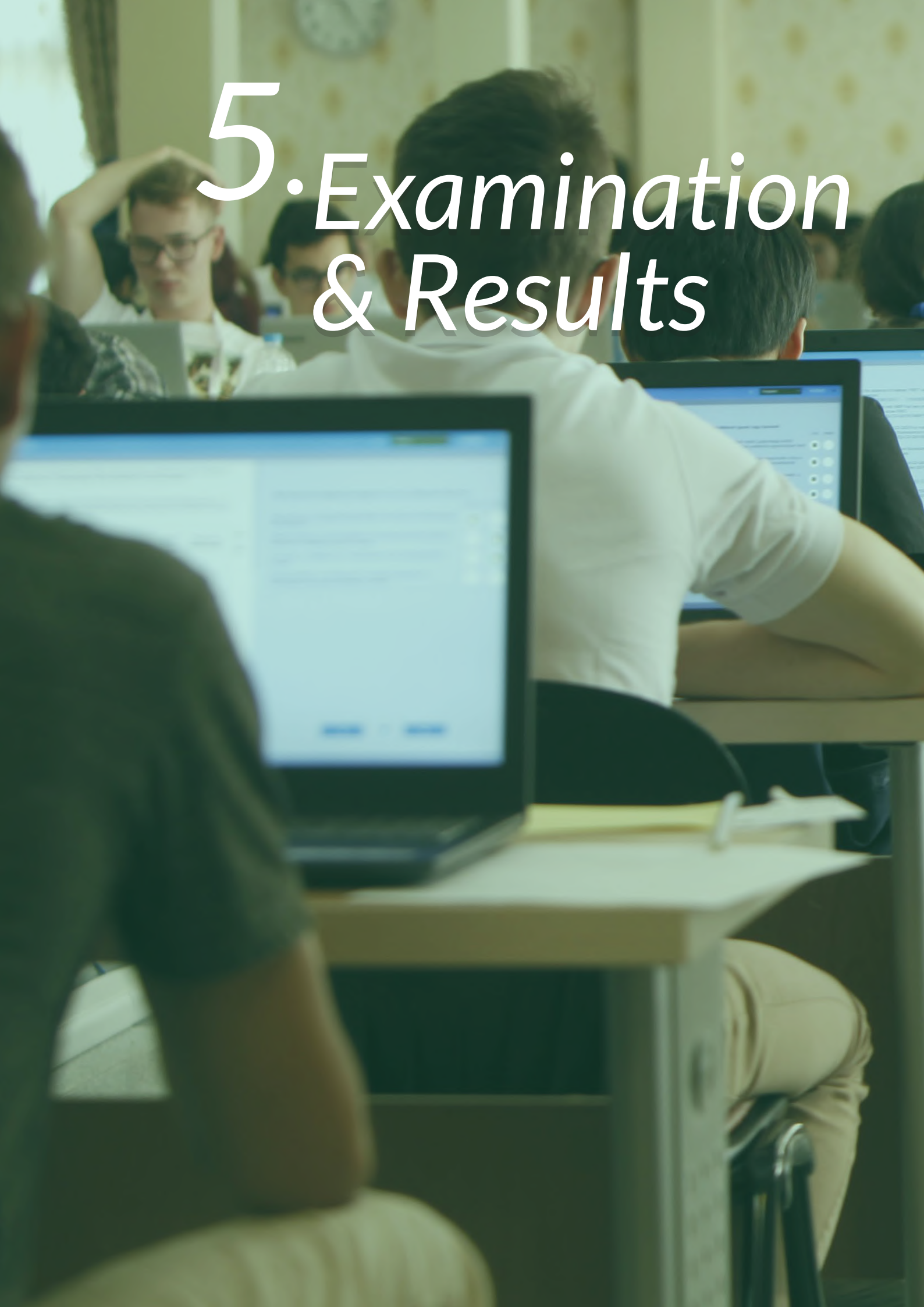
They joined senior scientific assistants one week prior to the practical exams. They helped in preparing and organizing the laboratories for exams due to their former experience in organizing IrBO summer camps. Their experience enabled the execution of the practical exams roughly without any mistake. Their great performance, professional behavior, and being helpful was acknowledged by the inspectors. In each lab, one of the most skilled former IBO medalists conducted the exam beside participants to serve as positive control and assure reproducibility of results in each round.

Marking the exams was very time consuming and complex. It was conducted by about 60 scientific assistants in the vicinity of the jury hall. They were triple checked in less than 48 hours. There were some mistakes in markings which were later revised in later rounds. Totally, 109 scientific assistants took part in organizing the practical exams.

IT Support Team

In order to support the technical requirements during IBO 2018 assemblies, i.e. jury sessions & theoretical exams, an expert IT team was recruited to set up the private secure wifi networks, provide and prepare laptops needed for exams and provide any onsite support to jury members and students. The private network in jury sessions was intended to support online IBO translation system and also provide a platform for remote printing via three industrial wifi connected printers around the hall.

Also, another separate secure network was set up to only allow access to examinations servers during theoretical exams. Although during the first minutes of jury assembly the network crashed because of the large number of simultaneous connections, the IT support team set up another network within 30 minutes in order to prevent any further delays in the session. The team also had prepared 30 fully charged backup laptops at the examination site so that if there were any problems during the exam process, they could change the student's laptop and prevent wasting time on debugging the problem.



5. Examination & Results

Starting the Journey

Long ago, the scientific community of Iran recognized the need for a national Olympiad in biology, which would lead to participation in the international Olympiads. Iran has been participating in the International Biology Olympiad since 1999. Enrollment of students in biology has grown steadily over time and currently stands at between 25,000 and 35,000 in different years.

The National Biology Olympiad in Iran(IrBO) is fully funded by the government of Iran through the ministry of education. The National Biology Olympiad is overseen by a National Steering Committee (NSC) of eminent experts in each subject of biology.

After 5 years of Iranian participation in IBO, during IBO 2005 in Beijing for the first time, we became a candidate to host the IBO in 2014 which was approved in the coordinators meeting. After a while, we found out that July 2014, will coincide with the holy month of Ramadan. So, we decided to postpone it until 2018 which was again approved by the coordinators.

We started to prepare theoretical and practical questions, 18 months prior to July 2018. All lab equipment was identified in 2017 and ordered by the beginning of 2018. In order to make the competition fair, all pieces of lab equipment were brand new.

While we assume the International Biology Olympiad as a movement aimed at bringing the most gifted secondary and higher secondary students of the world together in a friendly competition of the highest level, our colleagues were working hard to bring us to the moments of IBO 2018. The Biology Olympiad does not lead directly to any career benefits; rather, they provide a stimulus to begin a career in biology, to undertake a lifelong journey into the realms of exciting intellectual challenges. The Biology Olympiad is not merely a competition, it is a meeting place of the brightest young minds of the world, and many friendships forged at the Olympiads form the seeds of scientific collaboration later in life.

Quality Assurance

Discussing the exams with sub-jury and surveillance during the exams by inspectors, guaranteed the high quality of the exams.

The sub-jury was selected during IBO 2017. They were invited to Iran one week before the IBO and discussed the exams with the scientific committee. The sub-jury meeting took place at the Azadi Hotel in Tehran which also hosted the juries during IBO. Due to the significant time which had been spent on the exam designs, roughly all questions were accepted by the sub-jury and their quality and novelty were appreciated by them. Also in the jury session during IBO, all questioned were accepted by the jury members from the national teams.

The Members of the sub-jury were:

- Alexander Rubtsov (Russia)
- Anindya “Rana” Sinha (India)
- Christiana Gebler (Germany)
- Poon Kasemsap (Thailand)
- Jan Cerny (Czech Republic)
- Mary Oliver (U.K)
- Vasili Pankratov (Belarus)
- Joshua Hodgson (U.K)
- Benjamin Hajnal (Hungary)

Like every year since IBO 2004, inspectors kept surveillance on the execution of the practical and theoretical exams to ensure that they were running accurately. Their report about the exams for the juries had an undeniable effect to diminish disputes. These inspectors were selected in jury sessions before the exams.

Theoretical Exams

The two theoretical exams (T1 and T2) had a total time of six hours (three hours each). The first exam was consisted of 47 question: biochemistry and molecular biology (15 questions), animal physiology and anatomy (11 questions), plant physiology and anatomy (10 questions), ecology and evolution (11 questions). The second theoretical exam consisted of 51 questions: biochemistry, genetics and cell biology (16 questions), animal physiology and anatomy (15 questions), plant physiology and anatomy (9 questions), ecology and evolution (11 questions).

Theoretical exams were taken on laptops using the software introduced in IBO 2013 and upgraded in IBO 2015

Theoretical exams were taken on laptops using the software introduced in IBO 2013 and upgraded in IBO 2015. This was only possible with a lot of help and effort from Prof. Daniel Wegmann and Jonas Helfer from Switzerland. We had provided 270 laptops in a single exam hall,

where all laptops were connected to a private secure network. Each participant had their username & password randomly generated and put into individual pockets taped to their desk. In addition, 20 laptops were provided as backups. Using the software, each student had their own combination of statements in each question. This option & the fact that the seats had anti-parallel orientation significantly mitigated any chance of cheating. Moreover, the IT team were able to monitor the performance of all students and check for technical issues at the moment.

Although so many issues had been cosidered and many pilot runs had been conducted, we faced the following setbacks:

- One student had a version with wrong translation
- Three students had to change their laptop during the exam; these students got 4 extra minutes added to their time
- Two students were blocked out of the system before the end of time; these students got 4 extra minutes added to their time
- The caption for figures A16, A18 & A21 were messed up; thanks to Daniel & Jonas this was resolved immediately and 2 extra minutes added to everyone

Practical Exams

Four practical tasks were designed to evaluate participants' laboratory skills and biological knowledge. They also tested participants' time and stress management ability and multitasking.

The four practical exams were in the following disciplines:

1. Molecular Biology & Biochemistry (Organizer: Prof. Elahe Elahi, University of Tehran)
2. Animal Anatomy & Physiology (Organizer: Prof. Alireza Sari, University of Tehran)
3. Evolution, Ecology & Behavior (Organizer: Dr. Ata Kalirad, Institute for Research in Fundamental Sciences,IPM, and Dr. Mehregan Ebrahimi, Shiraz University)
4. Plant Ecophysiology & Systematics (Organizer: Prof. Faezeh Ghanati, Tarbiat Modares University)

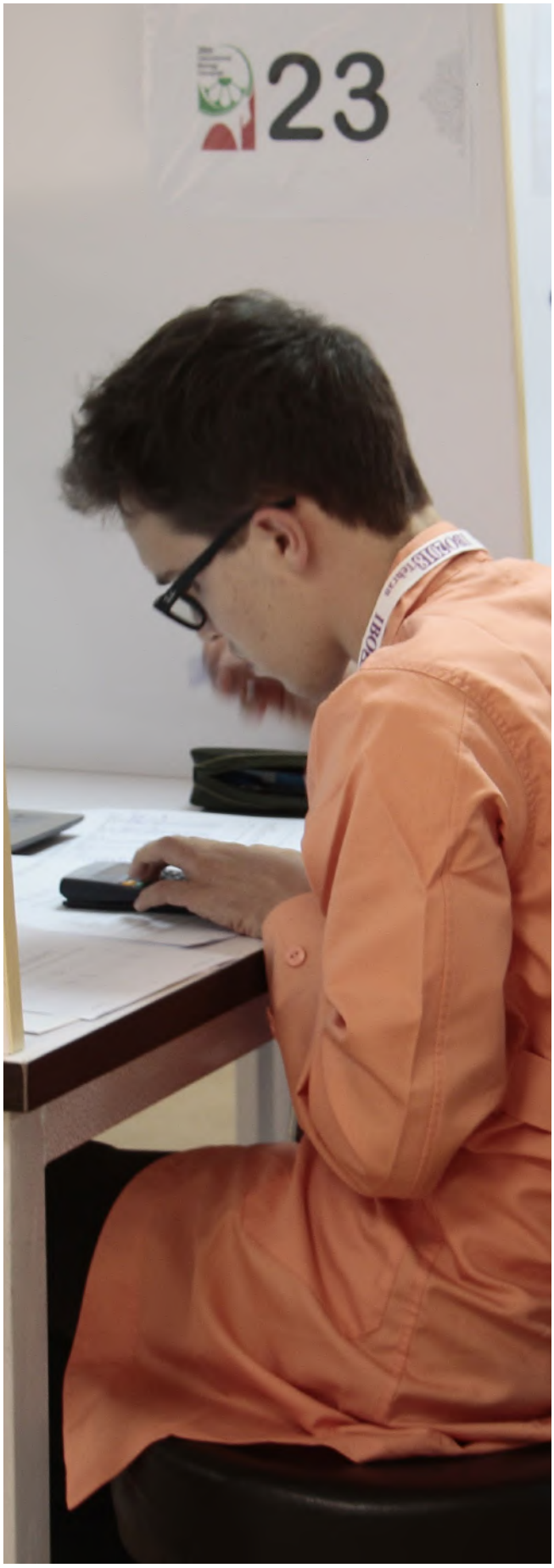
Testing exams by Iran previous IBO participants started while exams were still in the design process. It helped a lot to design exams which were novel and can test participants' skills and knowledge, while being feasible to prepare and execute for 70 participants simultaneously and can be reset in 30 minutes, during the time participants are rotating between different tasks.

Each of the practical exams was conducted in one of the four big halls in Shahid Beheshti University, which were equipped with appropriate air conditioning system, new furniture, and corresponding laboratory equipment. All equipment (including micropipettes, microscopes, gel-docs and ...) were brand new and had not been used before. Organizing each exam in a single hall, facilitated the preparation and management of the exams.

As far as none of the lab organizers were from Shahid Beheshti University, one of the professors of the host university acted as laboratory supervisor for each practical exam. They managed preparation of the halls for the exams as they were familiar with the setting.

In each hall, each country had a constant desk and their participants used the same laboratory equipment in consecutive rounds.

The majority of marking the exams were conducted by the scientific assistants and organizers afterward. Only the dissections in the Animal Anatomy & Physiology exam were marked in the examination hall simultaneously during the exam.



Examination Results

Extracting The Result

The practical exams raw results were extracted by scientific assistants under the supervision of professors after the exams were done. Each exam was triple checked within 48 hours. The results were inserted into excel sheets and were delivered to the statistics team for further analysis and ranking. The theoretical exams results were extracted by the IT team right after the exams were finished.University of Tehran)

Statistical Analysis of the Results

For each practical task and theoretical exam, the standard score was calculated for all students. The standard score (SS) was calculated using the following formula:

$$SS = \frac{RS - MS}{SD}$$

Where RS is the raw score for an individual in a certain task (P1-P4), MS is the average raw score of all students in that certain task and SD is the standard deviation of scores in that task.

The same method was applied for the sum of two theoretical exams (T1 and T2), resulting in five standard scores: SSP1, SSP2, SSP3, SSP4, SST. For practical exams, a second normalization was applied, which was introduced in IBO 2013, in order to balance all four tasks evaluating different skills. To do so, the sum of SSP1, SSP2, SSP3, SSP4 was calculated and the previous formula was applied to calculate the SSTotalP. Finally, the sum of SSTotalP and SST was used to calculate the final scaled score.

Based on the final scores and 10%-20%-30%-10%-30% distribution of medals (gold, silver, bronze, merit and no medal, re-

spectively) being required by IBO guideline, the final ranking and medals were done:

- Gold: 29 (11.1%)
- Silver: 53 (20.3%)
- Bronze: 82 (31.4%)
- Merit: 27 (10.3%)
- No medal: 70 (26.8%)

Normalizing Participants' Scores

Figure 4.1 shows the violin plots of theoretical exams scores. The red areas corresponds to the distribution of scores, where there is a minimum of 6 and maximum of 35.25 for the first part, while the min and max of the second part are 6.75 and 35.5, respectively. Moreover, the mean of the first and second part were 19.5 and 18.7, respectively.

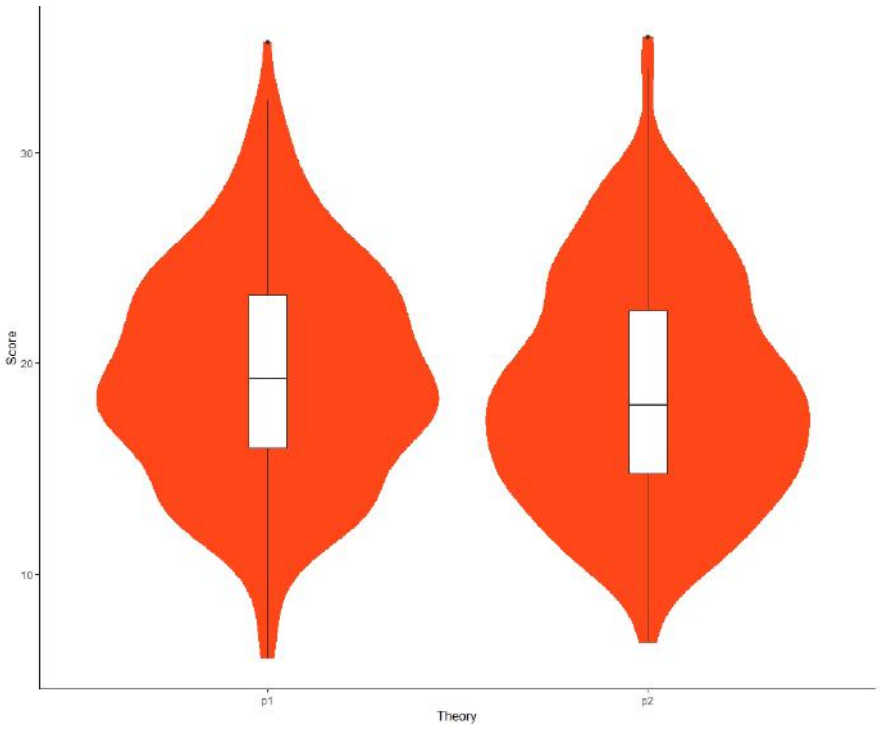


Figure 4.1. Violin Plots Of Theoretical Exams Scores

Figure 4.2 shows the violin plot of practical tasks scores. The green area corresponds to the distribution of scores. In the first practical exam (P1_animal), the minimum, maximum and mean were 1, 71.4 and 35.4, respectively. In the second practical exam (P2_plant), the minimum, maximum and mean were 0, 59.5 and 22.7, respectively. In the third practical exam (P3_evolution), the minimum, maximum and mean were 18.4, 85.5 and 47.3, respectively. In the fourth practical exam (P4_biochem), the minimum, maximum and mean were 0, 92 and 43.9, respectively.

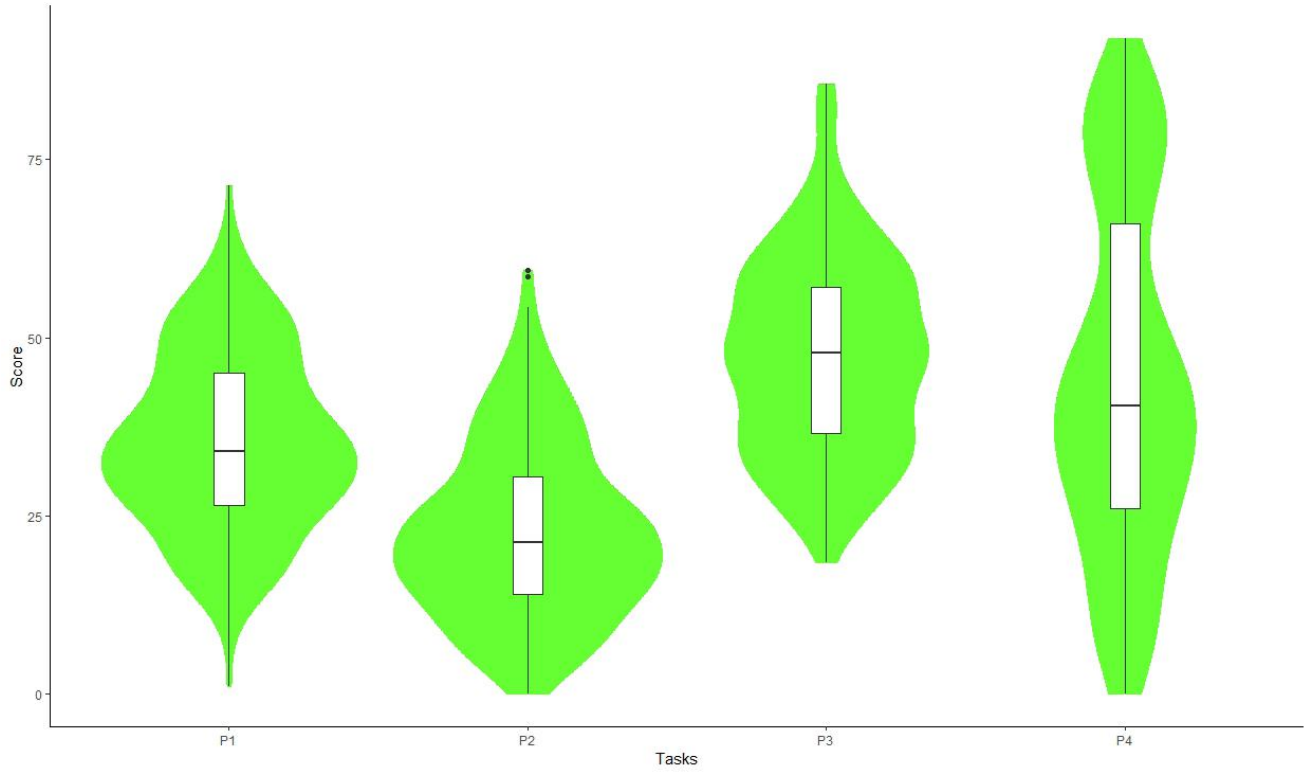


Figure 4.2. Violin Plots Of Practical Exams Scores

Figure 4.3 shows the scores correlation between the first and second theoretical exams (P value<0.001 and correlation coefficient=0.748).

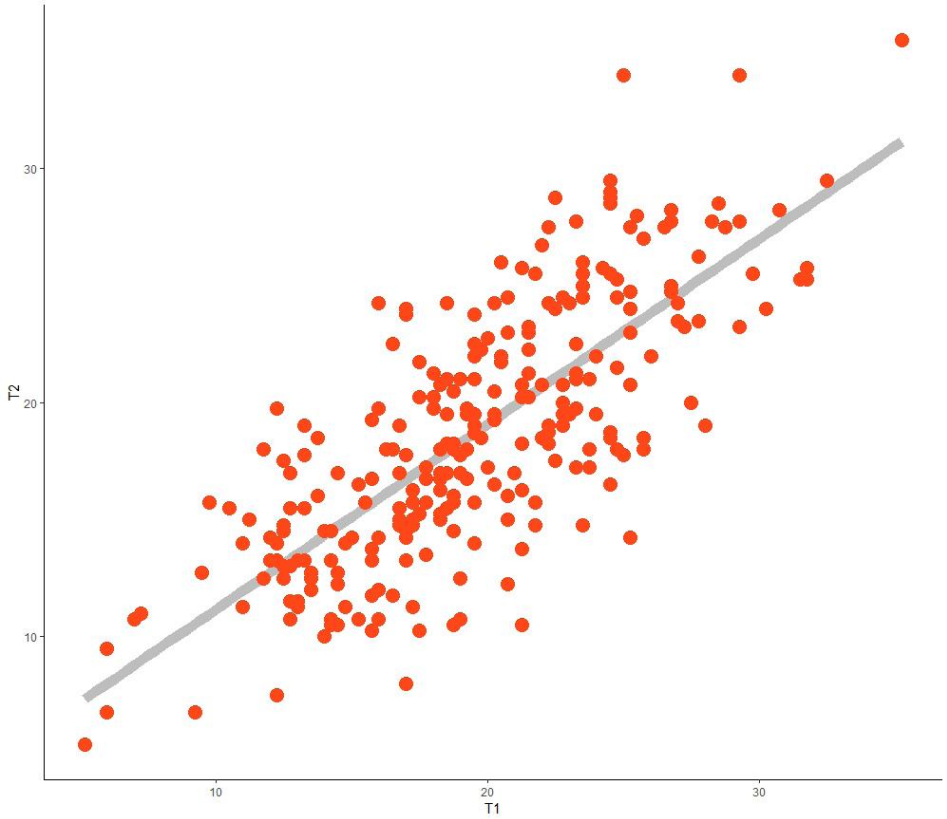


Figure 4.3. Correlation Between The First And Second Theoretical Exams

The next six figures demonstrate pairwise correlations between practical exams. Figure 4.4 shows the correlation between P1_animal and P2_plant scores (P value<0.001 and correlation coefficient=0.541), Figure 4.5 shows the correlation between P1_animal and P3_evolution scores (P value<0.001 and correlation coefficient=0.456), Figure 4.6 shows the correlation between P1_animal and P4_biochem scores (P value<0.001 and correlation coefficient=0.504), Figure 4.7 shows the correlation between P2_plant and P3_evolution scores (P value<0.001 and correlation coefficient=0.542), Figure 4.8 shows the correlation between P2_plant and P4_biochem scores (P value<0.001 and correlation coeffi-

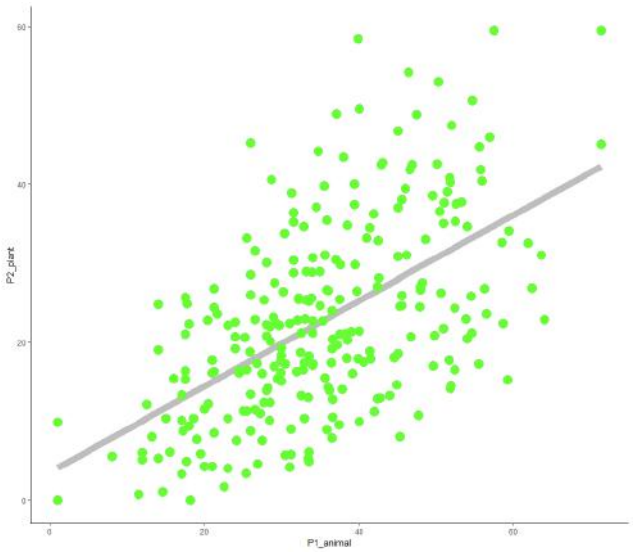


Figure 4.4. Correlation Between P1_animal `& P2_plant Scores

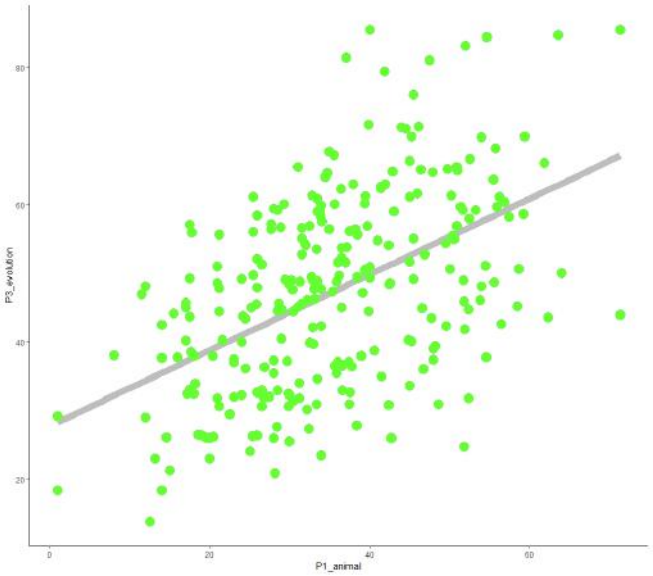


Figure 4.5. Correlation Between P1_animal & P3_evolution Scores

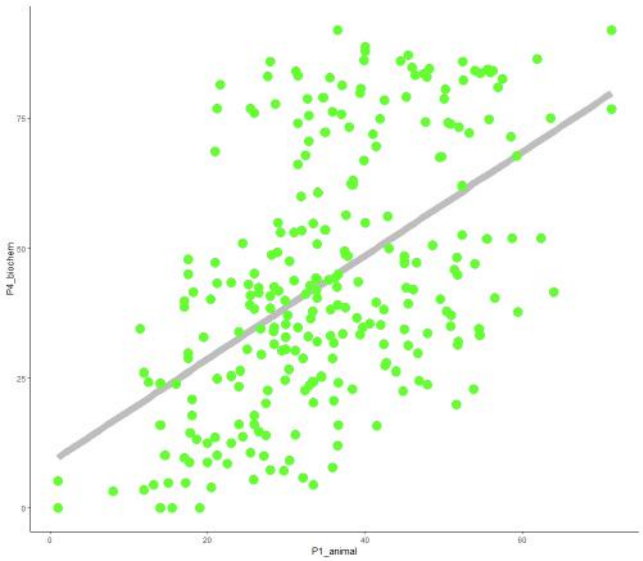


Figure 4.6. Correlation Between P1_animal & P4_biochem Scores

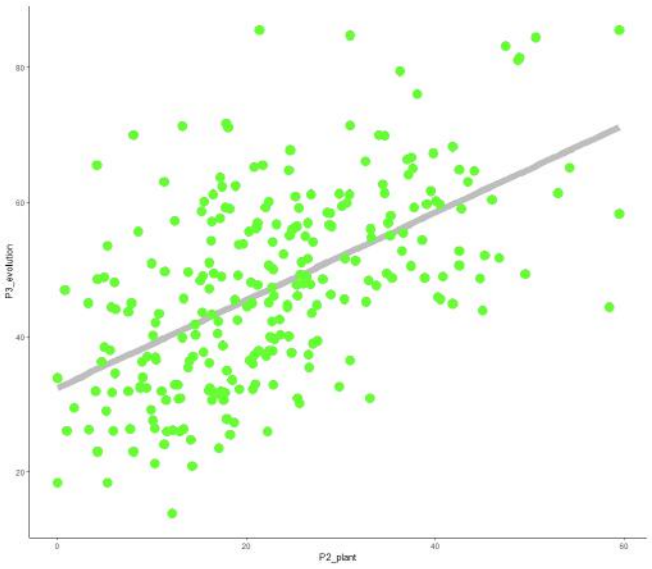


Figure 4.7. Correlation Between P2_plant & P3_evolution Scores

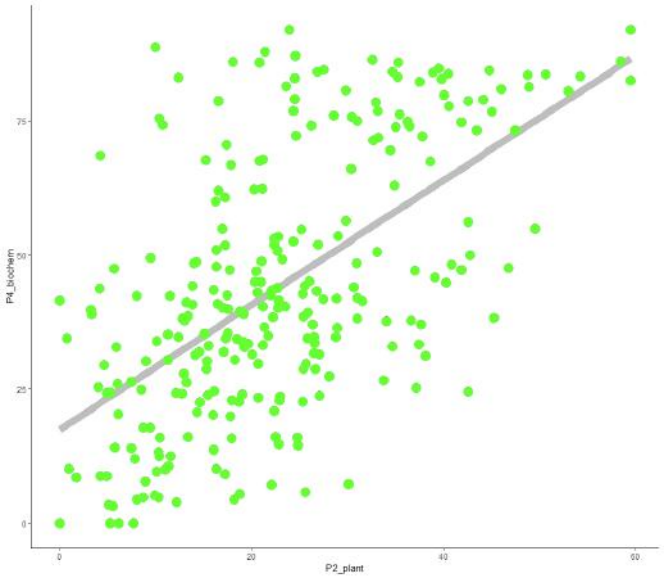


Figure 4.8. Correlation Between P2_plant & P4_biochem Scores

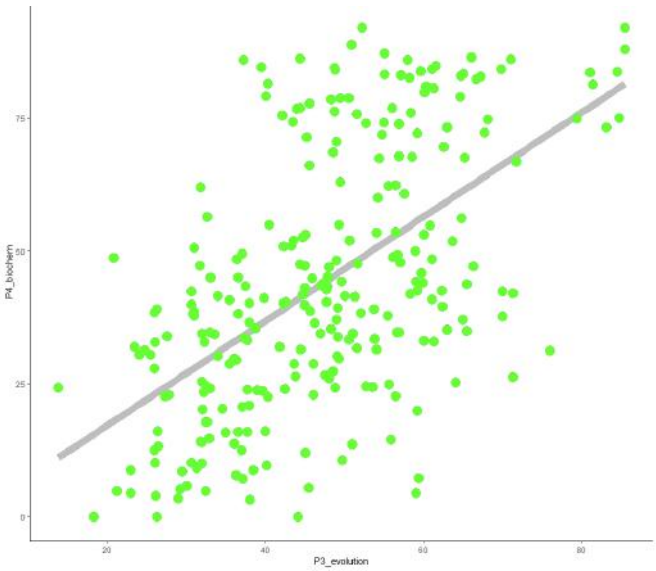


Figure 4.9. Correlation Between P3_evolution & P4_biochem Scores

Finally, figure 4.10 demonstrates the association of theoretical and practical exams final t-scores (P value<0.001 and correlation coefficient=0.748).

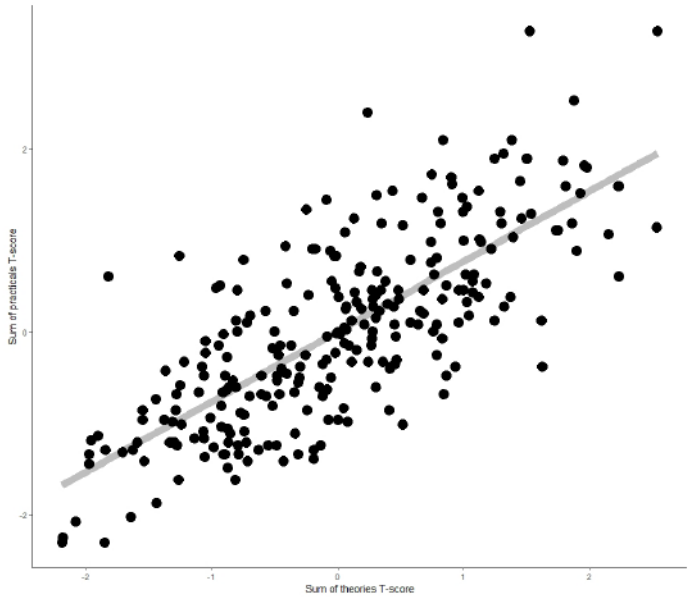


Figure 4.10. Association Of Theoretical And Practical Exams Final T-scores

6·*Innovations*

6.1. Novel Practical Exams

6.2. Modeling Evolutionary Genetics

6.3. IBO Software Tweaks

6.4. Training Highschool Teachers

6.5. Creating IBO Stamp

Novel Practical Exams

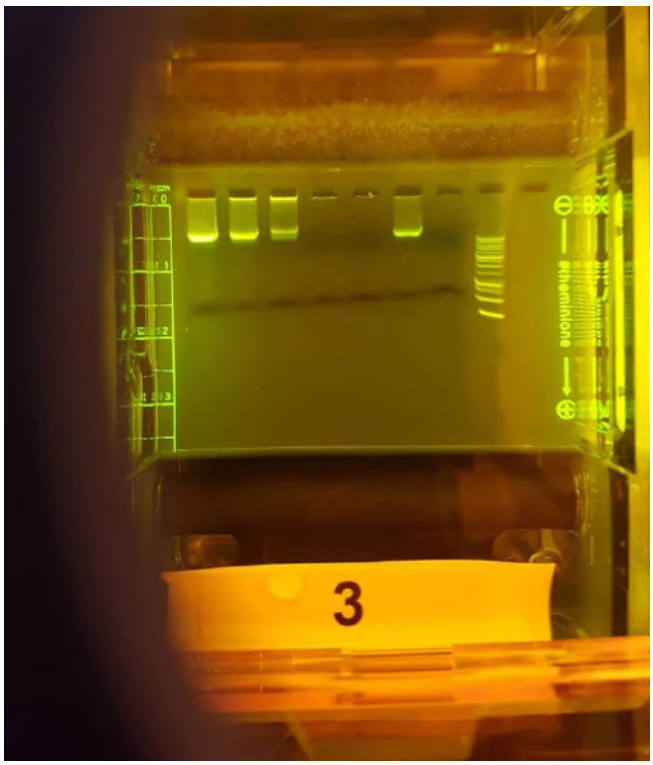
For the first time in the biochemistry and molecular biology experiment of IBO, students were asked to do protein purification, protein quantification, DNA - protein interaction, gel electrophoresis and DNase assay in one examination.

They were instructed to do mobility shift assay which is an electrophoretic separation of a protein–DNA on agarose gel for a short time. The implemented peptide was newly designed. For the preparation of crude extract, hundreds of liters of bacterial culture were prepared 3 days before the exam. 260 student, each was provided with 83 items for the exam which required a heavy effort.

The design of the practical task for evolution, ecology, and behavior (EEB for short) posed a major conundrum to the task force responsible for this task: how to simulate the research done in modern evolutionary biology and ecology? The evolutionary biology in recent decades has been relying more and more on the experimental breakthroughs, especially Richard Lenski's landmark experimental evolution project. Simultaneously, computational biology has become an integral part of research in evolution and ecology. The design of the practical task for this part of IBO 2018 was an attempt to reflect such scientific developments in EEB.

To present parts of their results that took two weeks to conduct, we quickly dismissed the idea of repeating the lab

work, and instead settled on providing the students with 3d printed plates that show the diversity of different bacterial strains at different stages of evolution. This approach, aside from enabling the students to analyze the results of a long experimental in a part of the EEB practical task, eliminates any unwanted variation between samples provided to each student.

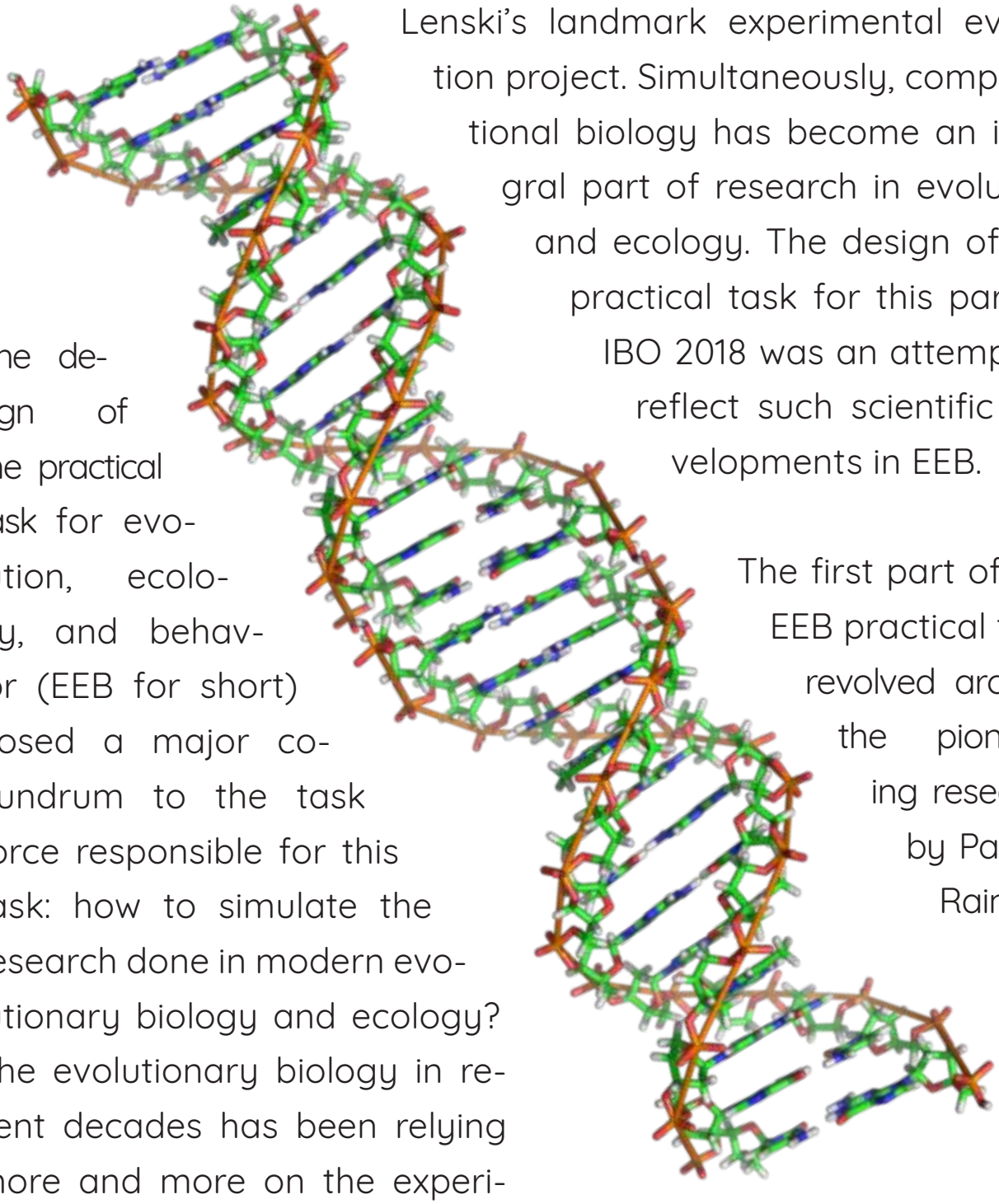


Also, a computational model was used to introduce the students to way heterozygosity would change as a function of population size, mutation rate, and selection. Students would use from a set of available parameters in the graphic user interface of this program and would see the change in heterozygosity over time as a result of those parameters. The program was a simple implementation of the Wright-Fisher model.

In the animal biology practical exam, 2000 slides from ticks were prepared which took 3 month time and a heavy effort.

In the plant biology practical exam, 1500 sample from endemic plants were collected and became fixed.

Modeling Evolutionary Genetics



The design of the practical task for evolution, ecology, and behavior (EEB for short) posed a major conundrum to the task force responsible for this task: how to simulate the research done in modern evolutionary biology and ecology? The evolutionary biology in recent decades has been relying more and more on the experimental breakthroughs, especially Richard Lenski's landmark experimental evolution project. Simultaneously, computational biology has become an integral part of research in evolution and ecology. The design of the practical task for this part of IBO 2018 was an attempt to reflect such scientific developments in EEB.

The first part of the EEB practical task revolved around the pioneering research by Paul B. Rainey

& Michael Travisano. The concept of adaptive radiation is key to understand the diversity of life on our planet, and this work vividly illustrates this concept in a simple and easy to comprehend fashion. In order to present parts of their results that took two weeks to conduct, we quickly dismissed the idea of repeating the lab work, and instead settled on providing the students with 3D printed plates that show the diversity of different bacterial strains at different stages of evolution. These plated were printed in Iran. This approach, aside from enabling the students to analyze the results of a long experimental in a part of the EEB practical task, eliminates any unwanted variation between samples provided to each student. The key concept introduced to the students during this part of our task, aside from adaptive radiation, was the fundamental of heterozygosity.

In the second part, a computational model was used to introduce the students to way heterozygosity would change as a function of population size, mutation rate, and selection. Students would use from a set of available parameters in the graphic user interface of this program and would see the change in heterozygosity over time as a result of those parameters. The program was a simple implementation of the Wright-Fisher model.

In the third part, the concept of heterozygosity introduced in the previous sections was further expanded. Using video recordings of Drosophila larvae, students were tasked to record the frequencies of two phenotypes (rovers and sitters) and calculate the change in heterozygosity in order to understand the effect of frequency-dependent selection on diversity over time.

Software Tweaks

The software which was developed for IBO 2013 theoretical exams was updated and some new features were added to it, including the ability to randomly change the order of statements of questions for different students of a country. It reduced the chance of cheating significantly in such a big hall. The software could also monitor each student's internet connection and participants who had some problems with bad internet connection were provided with extra time. The software could also monitor each student activity during the exam and analyzing these data yielded useful and interesting results, including those mentioned earlier in the theoretical exams section in this report.

Training Highschool Teachers

Besides hosting the IBO in Tehran, 64 high school biology teacher from different parts of Iran gathered and attended in 8 workshops at Shahid Beheshti University to increase their biological knowledge and get to know National and International Biology Olympiads(IrBO & IBO). These workshops were conducted by Shahid Beheshti University professors. We aimed to improve their educational insights by making them familiar with IBO educational goals (including evaluating student's scientific reasoning ability instead of their knowledge). We also aimed to make IBO 2018 popular in Iran.

Creating IBO Stamp

The IBO 2018 stamp was created in collaboration with Iran National Post and it was signed by jury members and the participants.

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7. Pitfalls

7.1. Uncontrolled Access to Excel

7.2. Sanctions

Uncontrolled Access to Excel

One problem we faced was in the Evolution, Ecology & Behavior practical task. This task required lots of calculation and as laptops were there for the modeling program to run, we enabled participants to use Windows calculator app for their calculations. After the end of the practical exam, we received some reports that some participants illegally used Microsoft Excel to automate most of the calculations. We then went back to the examination hall and checked system logs to find out who and when opened the Excel program. Then extracted the result of those participants. These participants' score did not have a significant difference with others so we took no action to eliminate their scores. In further examinations, these applications should be locked from being accessed during exams.

Sanctions

One of the main limitations in IBO 2018 was the imposed US sanctions on Iran which brought about limited access to some lab equipment. In one case, we were obliged to bring electrophoresis system from the manufacturer through a third party country in order to bypass these sanctions. On the other hand, new sanctions on Iranian banking system lead to freezing of registration fees in IBO account in Germany.

Annex 1. Final Results

Rank	Country	Name	Practical T Sums	T of Practical T Sums	Theoretical T Sums	T of Theoretical T Sums	Final T	Award
1	Vietnam	Nguyen Phuong Thao	4.909	1.525	70.8	3.288	4.813	Gold
2	China	Yuchen Yao	6.037	1.875	63.3	2.529	4.405	Gold
3	Chinese Taipei (Taiwan)	Yun-Chen Chen	7.189	2.233	54.0	1.594	3.827	Gold
4	Iran	Parmida Sadat - Pezeshki	7.163	2.225	54.0	1.594	3.819	Gold
5	Chinese Taipei (Taiwan)	Yu-Chi Cheng	6.384	1.983	56.0	1.796	3.780	Gold
6	China	Yuxiang Yang	6.295	1.956	56.3	1.822	3.777	Gold
7	Chinese Taipei (Taiwan)	Chen-Yu Lu	8.165	2.536	49.5	1.139	3.675	Gold
8	Poland	Pawel Franciszek Tyrna	5.760	1.789	56.8	1.872	3.661	Gold
9	Vietnam	Tran Thi Minh Anh	4.457	1.385	59.0	2.100	3.484	Gold
10	Singapore	Yun Wei Shermane Lim	6.207	1.928	53.3	1.518	3.447	Gold
11	Russia	Artem Pustovid	5.828	1.811	54.0	1.594	3.405	Gold
12	China	Shangjian Liu	4.839	1.503	57.0	1.897	3.401	Gold
13	China	Xuanzhi Wang	4.826	1.499	57.0	1.897	3.397	Gold
14	Russia	Azat Garaev	4.231	1.315	57.5	1.948	3.262	Gold
15	Iran	Nikan Amirkhani	6.920	2.150	48.8	1.063	3.213	Gold
16	United Kingdom	Patrick Thomas Norcliffe Mccubbin	4.004	1.244	57.0	1.897	3.141	Gold
17	Singapore	Wei Jun Justin Ng	4.662	1.448	54.5	1.645	3.093	Gold
18	South Korea	Seunghyun Park	5.983	1.859	50.0	1.190	3.048	Gold
19	Vietnam	Hoang Minh Trung	2.681	0.833	59.0	2.100	2.93	Gold
20	United Kingdom	Rebecca Jane Marrow	5.633	1.750	49.3	1.114	2.864	Gold
21	Singapore	Xu Rui Isaac Chan	5.574	1.732	49.3	1.114	2.845	Gold
22	Switzerland	Jana Katharina Meier	7.183	2.231	44.3	0.608	2.840	Gold
23	United Kingdom	Brandon Trevor Tang	4.948	1.537	51.0	1.291	2.828	Gold
24	Chinese Taipei (Taiwan)	Geng-Yu Shen	6.106	1.897	47.0	0.886	2.783	Gold
25	Turkey	Ismail Hakki Dur	4.692	1.458	50.5	1.240	2.698	Gold
26	Germany	Paul Bunk	3.602	1.119	53.5	1.543	2.663	Gold
27	Russia	Danil Afonin	0.769	0.239	62.0	2.403	2.642	Gold
28	South Korea	Jonghan Park	4.158	1.292	51.3	1.316	2.608	Gold

29	South Korea	Jaewon Lee	2.902	0.902	55.0	1.695	2.597	Gold
30	India	Kunjal Parnami	2.909	0.904	54.3	1.619	2.523	Silver
31	Iran	Sara - Mohammadi	4.182	1.299	50.0	1.190	2.489	Silver
32	Czech Republic	Vojtech Broz	2.408	0.748	55.3	1.720	2.469	Silver
33	Indonesia	Samuel Kevin Pasaribu	3.184	0.989	52.8	1.468	2.457	Silver
34	Indonesia	Syailendra Karuna Sugito	4.487	1.394	48.5	1.038	2.432	Silver
35	South Korea	Junyoung Eugene Byeon	3.305	1.027	51.8	1.366	2.393	Silver
36	Thailand	Paris Nilthalak	3.205	0.996	51.3	1.316	2.312	Silver
37	India	Stuti Khandwala	3.625	1.126	48.3	1.013	2.139	Silver
38	India	Vishwesh Bharadiya	2.151	0.668	52.8	1.468	2.136	Silver
39	Indonesia	Aditya David Wirawan	3.919	1.218	47.3	0.911	2.129	Silver
40	Russia	Irina Iarutich	3.650	1.134	48.0	0.987	2.121	Silver
41	Germany	Ederer Bruno	2.565	0.797	51.3	1.316	2.113	Silver
42	Thailand	Rujeerada Wirojjananuwat	2.628	0.816	50.0	1.190	2.006	Silver
43	Hungary	Peter Vizkeleti	1.402	0.436	53.5	1.543	1.979	Silver
44	Turkey	Fatih Ozlugedik	1.003	0.311	53.0	1.493	1.804	Silver
45	Australia	Li-Shan Chen	4.416	1.372	42.0	0.381	1.752	Silver
46	Hungary	Peter Otott	5.205	1.617	39.5	0.128	1.745	Silver
47	Czech Republic	Jiri Janousek	2.395	0.744	48.0	0.987	1.731	Silver
48	Thailand	Thitiwat Asavalertpalakorn	3.474	1.079	44.5	0.633	1.712	Silver
49	Japan	Shigetaka Toba	3.791	1.178	43.5	0.532	1.710	Silver
50	Thailand	Niravit Chavanachinda	1.664	0.517	49.8	1.164	1.681	Silver
51	Singapore	Jia Xin Ong	3.269	1.016	44.5	0.633	1.649	Silver
52	Estonia	Martin Rahe	3.453	1.073	43.8	0.558	1.630	Silver
53	India	Shaswat Jain	4.258	1.323	41.0	0.279	1.602	Silver
54	Lithuania	Paulius Valiukevicius	2.530	0.786	46.3	0.810	1.596	Silver
55	Ukraine	Lada Isakova	1.110	0.345	50.0	1.190	1.534	Silver
56	Hungary	Kinga Tomcsanyi	3.607	1.120	42.0	0.381	1.501	Silver
57	Denmark	Andreas Sixten Hallstein Rygaard	2.383	0.740	45.8	0.760	1.500	Silver
58	Philippines	Gabrielle Erwin Gemeniano Awitan	3.439	1.068	42.5	0.431	1.500	Silver
59	Czech Republic	Lukas Fiedler	3.215	0.999	42.8	0.456	1.455	Silver
60	Czech Republic	Jonas Vlasak	3.098	0.962	42.8	0.456	1.419	Silver
61	Japan	Kiyoshi Ishida	2.449	0.761	44.5	0.633	1.394	Silver

62	United Kingdom	Amir Guppy	4.011	1.246	39.5	0.128	1.374	Silver
63	Netherlands	Ward De Ridder	0.418	0.130	50.5	1.240	1.370	Silver
64	Estonia	Kirke Joamets	2.770	0.861	43.3	0.507	1.368	Silver
65	Kazakhstan	Amanzhol Kuantay	1.853	0.576	46.0	0.785	1.361	Silver
66	Romania	Mitrofan Andrei	3.307	1.027	41.5	0.330	1.357	Silver
67	Vietnam	Hoang Van Dong	-0.303	-0.094	52.5	1.442	1.348	Silver
68	Australia	Jessica Marjorie Law	5.225	1.623	34.5	-0.378	1.245	Silver
69	Kazakhstan	Kairat Albakov	3.363	1.045	40.0	0.178	1.223	Silver
70	Estonia	Meeri Jyrgenson	2.664	0.828	41.8	0.355	1.183	Silver
71	Lithuania	Pavel Loginovic	0.186	0.058	49.0	1.088	1.146	Silver
72	Indonesia	Silingga Metta Jauhari	2.191	0.681	42.8	0.456	1.137	Silver
73	Poland	Kacper Ludwig	-0.803	-0.249	51.5	1.341	1.092	Silver
74	Bulgaria	Zdravko Plamenov Ivanov	3.087	0.959	39.3	0.102	1.062	Silver
75	Poland	Jaromir Bartosz Tomasik	1.013	0.315	44.8	0.659	0.973	Silver
76	Italy	Mattia Biavati	1.219	0.379	43.8	0.558	0.936	Silver
77	Germany	Kieran Elias Didi	1.543	0.479	42.8	0.456	0.936	Silver
78	Netherlands	Yelle Tanesha	0.579	0.180	45.3	0.709	0.889	Silver
79	Latvia	Arturs Sokolovskis	2.201	0.684	40.3	0.204	0.887	Silver
80	Netherlands	Tim Van Dijk	2.101	0.653	40.5	0.229	0.881	Silver
81	Portugal	Marco Antonio Ribeiro	2.530	0.786	39.0	0.077	0.863	Silver
82	Croatia	Luka Bulic Braculj	1.561	0.485	41.8	0.355	0.840	Silver
83	Belarus	Yana Barysovich	-0.186	-0.058	47.0	0.886	0.828	Bronze
84	Belarus	Darya Pisetskaya	0.543	0.169	44.8	0.659	0.827	Bronze
85	Latvia	Stanislavs Kurass	-0.043	-0.013	46.5	0.836	0.822	Bronze
86	Hungary	Daniel Boros	-0.093	-0.029	46.5	0.836	0.807	Bronze
87	Argentina	Maribel Gandara	1.105	0.343	42.8	0.456	0.800	Bronze
88	Iran	Mahdi Masrour	2.442	0.759	38.3	0.001	0.760	Bronze
89	Australia	Luke Oscar Hemmingsen	2.663	0.827	37.5	-0.074	0.753	Bronze
90	Sweden	Alexandru Golic	-0.581	-0.181	47.3	0.911	0.731	Bronze
91	Poland	Jaromir Jan Hunia	0.870	0.270	42.8	0.456	0.727	Bronze
92	Turkey	Birnur Sinem Karaoglan	1.426	0.443	41.0	0.279	0.723	Bronze
93	Belarus	Maksim Kastsou	2.061	0.640	39.0	0.077	0.718	Bronze
94	Ukraine	Roman Trokhymchuk	-0.650	-0.202	47.3	0.911	0.710	Bronze
95	Lithuania	Urte Beatrice Baublyte	0.975	0.303	42.3	0.406	0.709	Bronze
96	Ukraine	Vladyslav Yevtushok	1.269	0.394	41.3	0.305	0.699	Bronze
97	Finland	Leevi Oskari Kaukonen	1.863	0.579	39.3	0.102	0.681	Bronze

98	Japan	Masumi Suzuki	0.882	0.274	41.8	0.355	0.629	Bronze
99	Spain	Elisa Maranon Pinero	0.431	0.134	42.5	0.431	0.565	Bronze
100	Bangladesh	Auddithio Nag	0.915	0.284	41.0	0.279	0.564	Bronze
101	Italy	Matilde Callegarin	1.069	0.332	40.5	0.229	0.561	Bronze
102	Denmark	Claudia Charlott Lassen	3.006	0.934	34.5	-0.378	0.556	Bronze
103	Belarus	Kseniya Patseyeva	2.529	0.786	35.8	-0.251	0.534	Bronze
104	Switzerland	Henry Felix Stewart Wetton	1.459	0.453	39.0	0.077	0.530	Bronze
105	Canada	Ruiyang (Michelle) Guo	-1.334	-0.414	47.5	0.937	0.522	Bronze
106	Switzerland	Florin Robert Kalberer	-0.160	-0.050	43.8	0.558	0.508	Bronze
107	Bulgaria	Ivan Georgiev	0.485	0.151	41.5	0.330	0.481	Bronze
108	Finland	Anni Matilda Kauniskangas	-0.065	-0.020	43.0	0.482	0.461	Bronze
109	Sri Lanka	Shakthi Sulakkana Senarathne	0.969	0.301	39.8	0.153	0.454	Bronze
110	Slovakia	Dominik Kopcak	0.613	0.190	40.8	0.254	0.444	Bronze
111	Spain	Joan Escriva Font	1.484	0.461	37.8	-0.049	0.412	Bronze
112	Italy	Alessandro Rosa	0.018	0.006	42.0	0.381	0.386	Bronze
113	Romania	Gabroveanu Elena Diana	2.770	0.860	33.5	-0.479	0.381	Bronze
114	Slovenia	Bor Krajnik	0.209	0.065	41.0	0.279	0.344	Bronze
115	Canada	Purab Patel	0.192	0.060	40.8	0.254	0.314	Bronze
116	Netherlands	Emin Araftpoor	0.672	0.209	39.0	0.077	0.286	Bronze
117	Finland	Juuso Osmo Mikael Huhtivuo	0.896	0.278	38.3	0.001	0.280	Bronze
118	Bulgaria	Viktor Valyov Georgiev	0.355	0.110	39.5	0.128	0.238	Bronze
119	Portugal	Joao Sousa	0.870	0.270	37.5	-0.074	0.196	Bronze
120	Brazil	Samuel Maia De Carvalho	-0.747	-0.232	42.3	0.406	0.174	Bronze
121	Slovenia	Tim Zaversek	1.514	0.470	35.3	-0.302	0.168	Bronze
122	Bulgaria	Vanya Ivanova Milanova	2.698	0.838	31.5	-0.681	0.157	Bronze
123	Slovaki	Oliver Sporka	-1.293	-0.402	43.5	0.532	0.131	Bronze
124	Estonia	Anna Pauliina Rumm	0.857	0.266	36.8	-0.150	0.116	Bronze
125	Canada	Ze Jia (Frank) Chen	1.479	0.459	34.8	-0.353	0.107	Bronze
126	Kazakhstan	Selimzhan Chalyshkan	0.171	0.053	38.8	0.052	0.105	Bronze
127	Luxembourg	Maxime Marc Theisen	0.217	0.068	38.5	0.027	0.094	Bronze
128	Cyprus	Avgoustinos Ioannou	1.346	0.418	34.5	-0.378	0.040	Bronze
129	Romania	Alda Silvia	-2.421	-0.752	46.0	0.785	0.033	Bronze
130	Philippines	Nathan Ross Baoy Bantayan	1.154	0.358	35.0	-0.327	0.031	Bronze
131	Denmark	Mikkel Chuyi Yang	1.331	0.414	34.3	-0.403	0.010	Bronze
132	Slovaki	Simon Benjamin Spanyi	0.061	0.019	38.0	-0.024	-0.005	Bronze

133	Syria	Abdullah Moustafa Bannan	0.477	0.148	36.3	-0.201	-0.053	Bronze
134	Lithuania	Vakare Barbora Kucinskaite	0.281	0.087	36.8	-0.150	-0.063	Bronze
135	Brazil	Julia Alexsandra Galiza Soares	0.158	0.049	37.0	-0.125	-0.076	Bronze
136	Spain	Felix Haba Redondo	0.778	0.242	35.0	-0.327	-0.085	Bronze
137	Syria	Hani George Nassour	-1.124	-0.349	40.5	0.229	-0.120	Bronze
138	Romania	Mekdad Magdy	-0.281	-0.087	37.8	-0.049	-0.137	Bronze
139	Moldova	Andreea Jitaru	0.352	0.109	35.0	-0.327	-0.218	Bronze
140	Greece	Aristotelis Anastopoulos	-0.063	-0.020	36.0	-0.226	-0.246	Bronze
141	Turkey	Muhammet Usame Avci	0.973	0.302	32.3	-0.605	-0.303	Bronze
142	Georgia	Anna Toidze	-2.575	-0.800	42.8	0.456	-0.344	Bronze
143	Argentina	Violeta Sampedro	-1.853	-0.576	40.5	0.229	-0.347	Bronze
144	Slovaki	Jana Hennelova	-0.289	-0.090	35.3	-0.302	-0.392	Bronze
145	Georgia	Bachuki Dalakishvili	-4.049	-1.258	46.5	0.836	-0.422	Bronze
146	Kazakhstan	Turtemir Adilet	-3.003	-0.933	43.3	0.507	-0.426	Bronze
147	Mongolia	Bilguun Byambaa	1.318	0.410	29.8	-0.858	-0.449	Bronze
148	Luxembourg	Philippe Louis Leonardo Isacco Furlano	-0.384	-0.119	34.8	-0.353	-0.472	Bronze
149	Mexico	Jose Santiago Jara	-3.119	-0.969	43.0	0.482	-0.487	Bronze
150	Mongolia	Ashid Amarsanaa	1.667	0.518	28.3	-1.010	-0.492	Bronze
151	Japan	Shoko Hama	-1.623	-0.504	38.3	0.001	-0.503	Bronze
152	Switzerland	Michelle Noemi Knecht	-0.824	-0.256	35.8	-0.251	-0.507	Bronze
153	Brazi	Amarylis Lins Torres	-2.227	-0.692	40.0	0.178	-0.514	Bronze
154	Denmark	Rasmus Hildebrandt	-1.191	-0.370	36.8	-0.150	-0.520	Bronze
155	Greece	Petroula Leventaki	-0.176	-0.055	33.3	-0.504	-0.559	Bronze
156	Latvia	Ernests Tomass Auzins	-1.478	-0.459	36.8	-0.150	-0.610	Bronze
157	Mexico	Edwin Chavez	-2.318	-0.720	39.3	0.102	-0.618	Bronze
158	Greece	Viktoria Zarrou	-0.962	-0.299	34.5	-0.378	-0.677	Bronze
159	Spain	Carlos Ramon Guevara	-2.602	-0.808	39.5	0.128	-0.680	Bronze
160	Sweden	Ella Margareta Karinsdotter Ostlund	-1.663	-0.517	36.5	-0.176	-0.692	Bronze
161	Slovenia	Tina Logonder	-0.274	-0.085	32.0	-0.631	-0.716	Bronze
162	Australia	Sai Allison Campbell	-1.505	-0.467	35.8	-0.251	-0.719	Bronze
163	Syria	Haya George Nassour	-0.479	-0.149	32.3	-0.605	-0.754	Bronze
164	Luxembourg	Marie Everard	0.148	0.046	30.0	-0.833	-0.787	Bronze
165	Argentina	Guillermo Fabian Pacheco	-2.570	-0.799	38.3	0.001	-0.797	Merit
166	Philippines	Maria Janine Leano Juachon	-0.977	-0.304	33.3	-0.504	-0.808	Merit
167	Portugal	Filipa Oliveira	-0.380	-0.118	31.3	-0.706	-0.825	Merit

168	Turkmenistan	Kerimguly Gurbanmuhammedov	-1.438	-0.447	34.3	-0.403	-0.850	Merit
169	Iceland	Gizur Sigfusson	-1.302	-0.405	33.8	-0.454	-0.858	Merit
170	Costa Rica	Marco Andrey Vega Chaves	-1.011	-0.314	32.8	-0.555	-0.869	Merit
171	Pakistan	Laiba Naseer	0.260	0.081	28.5	-0.985	-0.904	Merit
172	Uzbekistan	Alisher Odilov	-2.926	-0.909	38.0	-0.024	-0.933	Merit
173	Uzbekistan	Khusen Egamov	0.014	0.004	28.8	-0.959	-0.955	Merit
174	Ukraine	Iryna Poplevicheva	-1.539	-0.478	33.5	-0.479	-0.957	Merit
175	Moldova	Ilinca Mazureac	-1.114	-0.346	31.8	-0.656	-1.002	Merit
176	Armenia	Artavazd Farsyan	-1.555	-0.483	33.0	-0.530	-1.013	Merit
177	Costa Rica	Joel Jose Rojas Gutierrez	-0.240	-0.075	28.8	-0.959	-1.034	Merit
178	Croatia	Kian Bigovic Villi	-1.953	-0.607	33.5	-0.479	-1.086	Merit
179	Costa Rica	Walter Alberto Chaves Umana	-3.040	-0.945	36.8	-0.150	-1.095	Merit
180	Iceland	Hera Gautadottir	-0.786	-0.244	29.8	-0.858	-1.102	Merit
181	Latvia	Anitra Zile	-1.488	-0.462	31.5	-0.681	-1.143	Merit
182	Mexico	Gerardo Cendejas	-3.381	-1.050	37.3	-0.100	-1.150	Merit
183	Georgia	Saba Birkadze	-2.832	-0.880	35.5	-0.277	-1.157	Merit
184	Uzbekistan	Khosiyatkhon Kudratova	-5.866	-1.822	44.3	0.608	-1.214	Merit
185	Belgium	Zelda Amelie Fery	-1.822	-0.566	31.3	-0.706	-1.272	Merit
186	Brazi	Pedro Henrique Silva De Oliveira	-3.378	-1.049	36.0	-0.226	-1.275	Merit
187	Montenegro	Marko Susic	-1.948	-0.605	31.5	-0.681	-1.286	Merit
188	Belgium	Lucas Chojnacki	-1.678	-0.521	30.3	-0.808	-1.329	Merit
189	Greece	Achilleas Eleftherakis	-2.677	-0.832	33.0	-0.530	-1.361	Merit
190	Sweden	Miriam Rosen	-0.428	-0.133	26.0	-1.237	-1.370	Merit
191	Croatia	Mirna Reljic	-2.885	-0.896	33.5	-0.479	-1.375	Merit

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