

Preparing Students for IOI: Thailand Country Report

Kanchit MALAIVONGS

Fellow, Royal Institute of Thailand
e-mail: kanchit.ma@gmail.com

Abstract. This paper describes the training process which is used to prepare Thai students for International Olympiad in Informatics. Thailand sent two observers to Minsk for the second IOI to find out about the contest and types of tasks used in the contest. Subsequently a selection process has been carried out every year to screen students for the training camps which are organized to provide students with adequate programming skills to solve the IOI tasks. At the beginning the training is under the responsibility of the Institute for the Promotion of Teaching Science and Technology (IPST). At present a new foundation, the Promotion of Academic Olympiad and Development of Science Education Foundation under the Patronage of Her Royal Highness Princess Galyani Vadhana Krom Luang Narathiwat Rajanagarindra helps share the training responsibility of all Academic Olympiads including IOI. Both organizations now work together to make sure that students in all parts of the country have equal opportunity to receive training and equal chance to be selected as the student representatives of Thailand to IOI.

Key words: olympiad, programming contest, programming camp.

1. Introduction

Thailand started its involvement with the IOI by sending two observers to participate in the second IOI at Minsk, Belarusian Republic, Soviet Union in 1990. The author was one of the observers at that time and the author was convinced that the contest was of high standard and, without proper trainings, Thai students would not be able to compete with other students at the IOI. This is because computer programming was not a part of the required curriculum for secondary education at that time. Even nowadays only some schools offer a programming course to students and the content is very basic indeed. If Thai students are to be successful in IOI, they must be trained on the topics used in IOI tasks.

The visit to Minsk was sponsored by the Institute for Promotion of Science and Technology Teaching (IPST). IPST is a semi-governmental organization reporting directly to the Minister of Education (www3.ipst.ac/eng/). IPST has responsibility in developing curriculum and textbooks on science, technology and mathematics for primary and secondary education. IPST had previously developed a computer curriculum for secondary schools. The first computer curriculum consisted of an Introduction to Computers and Basic Programming. Later, the curriculum was expanded to include an Introduction to Operating System, Introduction to Spreadsheet, and an Introduction to Databases.

The Ministry of Education officially recommended this curriculum for use in secondary schools throughout the country. However, the schools were not able to adopt the curriculum because they lacked qualified teachers and the curriculum itself was not compulsory. In addition, even in the schools that could adopt these courses, the students were not interested to take them. This is because the computer subject is not included in the entrance examination which is used for admitting students in various governmental universities.

Realizing these problems, the author and his co-observer recommended IPST to immediately start selecting students and prepare the training materials for them. The first problem was the lack of programming experts in IPST. Although IPST is involved with many teachers in high schools, we found that they did not have adequate background in programming and advanced problem solving. Fortunately, IOI activities are of interest to several faculty members in different universities and they were pleased to help in selecting and training students for IOI. The IPST director, through our advice, appointed a group of university instructors to be the members of the Subcommittee on IOI. The author was also appointed as the Chairman of this subcommittee.

2. Training

The academic year of Thai schools normally starts in the middle of May and ends in early March. The selection of students in the early years of Thai IOI trainings started by announcing a countrywide selection examination. The announcement was around July each year. The examination took only one day and consisted of only three main topics: mathematics, logic, and programming. The idea behind these topics is obvious. Mathematics is included to indicate to students that programming contest will definitely needs mathematical talent. Logic is to ensure that students are able to think logically when solving programming problem. The programming part in the selection examination is a simple algorithmic problem which can be programmed in Basic. In the early years only a few hundreds students applied to sit in the selection examination. At the present time, several thousands students are attracted to the examination.

Only the thirty topmost students were selected to attend the first training camp in October for four weeks. The camp site is the IPST office in Bangkok. IPST is well equipped with accommodation facilities as well as computers for practicing. After the three week training, an examination was given and 16 top students were selected for the second camp. This second camp was organized in two periods. The first period was in March and lasted for three weeks. At the end of this part, an examination was given to select ten students for the second period which lasted ten days. Four students were then selected for the IOI contest. Between April and July, these four students were required to practice tasks provided by their tutors during weekends. Students normally communicated with their tutors through the Internet and sometime they were required to attend a special class provided on weekends by the tutors. The overall training period normally lasted about ten months. Tasks that students are required to practice are those past IOI tasks. Test data were created for each task to test students' programs.

Table 1
Summary of medals achieved by Thai students

Year	Gold	Silver	Bronze
1991	–	1	2
1992	2	1	1
1993	–	2	1
1994	–	–	2
1995	–	–	2
1996	–	2	1
1997	–	1	3
1998	–	1	2
1999	1	–	2
2000	–	3	1
2001	–	1	3
2002	–	–	3
2003	–	3	1
2004	1	1	2
2005	2	2	–
2006	–	–	3
2007	1	3	–
2008	2	1	1
2009	1	2	1
2010	1	2	1
Total	11	26	32

The tutorial topics comprised of the following topics: discrete mathematics, data structure, linked lists, stack, queue, tree, sorting, merging, searching, graph, hashing, etc.

We are proud to say that the training programs enable our students to achieve very good results starting from the third IOI in Greece. Table 1 summarized the medals that Thai students received so far.

3. Selection Process

The success of Thai students in IOI very much depends on the patronage of Her Royal Highness Princess Galyani Vadhana, the Princess of Naradhiwas, who was very keen in promoting science education in Thailand. Learning that IPST could not obtain adequate budget for the Academic Olympiads, she helped provide financial supports to send students and team leaders to several olympiads. After discussion between IPST and Her Royal Highness, in 2000 the Promotion of Academic Olympiad and Development of Science Education Foundation under the Patronage of Her Royal Highness Princess Galyani Vadhana Krom Luang Narathiwas Rajanagarindra was founded with an understanding that working under the Foundation is more flexible (www3.ipst.ac/eng/). The ob-

jective of the Foundation is to provide trainings to secondary school students and to select suitable representatives to Academic Olympiads and other contests. The Foundation makes agreement with the IPST to take responsibility in the first stage trainings. This agreement has changed the procedure outlined above into the following.

Between July and August each year, the Foundation invites students to attend the Computer Programming Camp in October. The Foundation has previously established 14 training centers in a few schools in Bangkok and in different universities throughout the country. The centers receive financial supports from the Foundation and are responsible for inviting instructors to provide training. In 2010 there were 4,100 applicants and the Foundation selected only 600 students for this camp (Camp 1). The topics provided in the first camp are programming fundamentals and problem solving. Basic data structures are also taught to acquaint students with advanced topics. The main objective is to encourage students to write programs to solve various kinds of tasks. At the end of one month training course, 300–400 students are selected to attend the second camp in March (Camp 2). This camp lasts only 2 weeks and about 100 students are selected to the National Olympiad in Informatics contest in May.

The National Olympiad in Informatics is organized to select 25 students for the IPST training programs as outlined above. At present time the schedule of the IPST training is the same as that initiated several years ago. The difference are that the first selection process is carried out by the Foundation through the National Olympiad in Informatics and students are required to participate in four camps before being selected to IOI.

4. National Olympiads in Informatics

The National Olympiad in Informatics has a similar structure with that of the IOI. The students will compete in two contests each last about three hours. Three tasks chosen by the student trainers from each region are given in each contest. The tasks are similar to the IOI tasks but are less difficult. Submitted tasks are graded by a grader and results are automatically shown on the Internet.

The work of the Promotion of Academic Olympiad and Development of Science Education Foundation under the Patronage of Her Royal Highness Princess Galyani Vadhana Krom Luang Narathiwat Rajanagarindra is not limited to trainings of students for the IOI. The Foundation is responsible for trainings of all students to be selected for other Academic Olympiads as well. The Foundation also publishes textbooks and guidelines on different scientific subjects which stimulate interests among Thai youths.

To encourage students to undergo advanced study in science and technology, IPST provides scholarships for students who are selected as representatives in every Academic Olympiad to study in universities up to doctoral degree. However, students will receive the scholarship only when they select to study in the same field that they have been selected as a representative. Thai universities also agree to admit students who passes the second camps to those fields of choices without having to sit in entrance examinations.

5. Conclusion

In conclusion, all Academic Olympiads play a very important role these days. Newspapers and other media help promote the activities by making news on students who get medals. As a result, more and more students apply for the seats in the academic camps every year. We hope that this is a good means to strengthen the science education in the country. Most importantly, almost all Academic Olympiad's contestants have been attracted to academic and research professions which will help improve the quality of science and technology teaching at all levels of education in the country.

References

www3.ipst.ac/eng/. This website provides information about objectives, activities and achievements of IPST.

www.posn.or.th. This website currently displays only in Thai.



Dr. K. Malaivongs is the chairman of the IOI Selection Committee of the Institute for the Promotion of Teaching Science and Technology. His involvement with IOI started in 1990 when he went as an observer to the second IOI in Minsk, Belorussia, Soviet Union. He was the leader of Thai student team from 1991 to 2001. Besides his activity in IOI he is also the chairman of Sripatum University, one of the large private universities in Bangkok.