

# *First Call for Participation*

## **NAPROCK<sup>\*</sup> 9th INTERNATIONAL PROGRAMMING CONTEST**

(\* Nourishment Association for Programming Contest KOSEN, non-profit organization)

### **1. Overview**

#### **(a) Introduction:**

NAPROCK has co-sponsored the College of Technology Programming Contest (Kosen Procon) since 2008. Because of the flexibility of ideas and advanced skill level of the participants, the Kosen Procon has been gaining lots of media attention as well as acclaims by the leaders in the industry. In this welcoming background, we have started NAPROCK international programming contest since 2009. Since the start, the NAPROCK international programming contest has grown into an active venue of international communication for those who share the same passion for information technology throughout the world. We hope this great annual event will attract many applicants again this year.

This year, the NAPROCK 9th international programming contest is held with the 28th Kosen Procon. In this contest, the participants are challenged to utilize their insights and practical skills in information processing technology. The accumulation of their hard work in their study will come to fruition on the stage during the competition. Just like last year, we will call for participants in the following three categories: a Themed Section, an Original Section and a Competition Section. This is a great opportunity to check their ability in the international setting and we look forward to being inspired by a fresh approach with purely original ideas which only students can come up with. Also, we hope to witness many entries full of ingenuities, which take advantage of the cutting-edge information technologies introduced in recent years. This contest aims to promote flexibility of thinking through programming, at a very high level. At the contest, students from kosens or universities compete each other by utilizing knowledge and ideas in information processing technology they have learned everyday of their lives. It is required for them to make full use of the latest and evolving information processing technology.

#### **(b) Sponsors and Secretariat:**

<b>Main sponsor:</b>	Nourishment Association for Programming Contest KOSEN(NAPROCK)
<b>Co-sponsor:</b>	Technical College Association
<b>Supporters:</b>	Companies/institutes supporting 28 <sup>th</sup> Kosen Procon
<b>Supervising college:</b>	National Institute of Technology, Oshima College
<b>Judging Committee:</b>	Kosen Procon judging committee
<b>Secretariat:</b>	NAPROCK

#### **(c) Website:**

<b>NAPROCK Procon official site:</b>	<a href="http://naprock.jp/IntProcon/">http://naprock.jp/IntProcon/</a>
<b>NAPROCK facebook page:</b>	<a href="https://www.facebook.com/naprock2008">https://www.facebook.com/naprock2008</a>
<b>Kosen-Procon official site:</b>	<a href="http://www.procon.gr.jp/">http://www.procon.gr.jp/</a>

#### **(d) Important Dates and Venue:**

<b>Application Period:</b>	<b>May 19(Fri)-June 9(Fri), 2017</b>
<b>Contest Dates:</b>	<b>October 8(Sun)-9(Mon), 2017</b>
<b>Venue:</b>	<b>Shunan-Shi-Bunkakaikan</b> (5854-41, Tokuyama, Shunan-shi, Yamaguchi 745-0874, Japan)

## **(e) Application Qualification:**

- Students in foreign universities/institutes in cooperation with Japanese KOSEN (Institute of Technology/Polytechnic)
- Students in domestic universities
  - (\* Japanese Kosen students attending the Kosen Procon will also be automatically entered in NAPROCK International Programming Contest.)

## **(f) Application Categories and Examination Method:**

We would like to welcome any team to develop software executable on PCs or tablets and to participate in any of the following 3 categories:

### **Themed Section and Original Section:**

The teams will be judged for its overall performance from their presentation skill to the demonstration quality. The focus is placed on originality, applicability, operation performance, system development skill, manual development skill and presentation skills (the quality of both the stage presentation and presentation material), and other aspects are to be considered.

Both the operation manual and the sources list of the program are subject to be examined. Thus, every team must submit the operation manual and the sources list of the program in advance before the designated deadline. Every team will be informed about the submission procedure of these materials later.

Each team can include 2-5 student members.

### **Competition Section:**

Each team competes in a progressive tournament for victory.

The winners of the special awards are selected based on the overall performance of the developed software/system including the system overview, the sources list of the program, the user interface of the program and the detailed system description. Please submit the following supporting documents before the designated deadline for judgment: the sources list of the program, and the detailed system description. The submission procedure of these materials will be provided to every team later.

Each team can include 2-3 student members.

### **NOTES:**

Any student members CANNOT enter two or more categories at the same time.

## **(g) Awards:**

### **Themed Section and Original Section:**

Grand Prize: 1 team, Second Prize: 1 team, Special Prize: several teams

### **Competition Section:**

Champion: 1 team, First Runner-up Prize: 1 team, Special Prize: several teams

## **(h) Miscellaneous Notifications:**

### **Double Registration:**

Any Student members CANNOT enter two or more categories at the same time.

### **Travel Costs and Reservations:**

Travel costs should be basically covered by each participating team. NAPROCK can have financial support for foreign teams (Conditions apply). Please ask the Japanese KOSENs in

cooperation with your team for the details. Flights, trains and accommodations should be basically booked by each participating team or Japanese KOSENs in cooperation with each team.

**Logistics:**

Each team should carry/transport any computers/devices required for the contest at its own risk. Please ask Japanese KOSENS if any help is required. The organizer will not supply any computers/devices.

**Demonstration Spaces:**

A demonstration space will be assigned to each team participating Themed/Original section. Each space is limited within 1800mm(w)\*1500mm (d)\*1800mm (h) including any PCs, devices as well as presenters.

**Internet Connections:**

For the internet connection, a wired LAN connection (at its best available performance) will be provided to each booth. For the demonstration hall, the organizer will provide a wireless connection (at its best available performance).

The participating team may set up a wireless LAN access point in the booth. Depending on the volume of usage, however, the connection may become unstable. Therefore, we would like to encourage you to use the main access point of the venue, for the general connection needed from your device such as a tablet, instead of setting up an additional wireless LAN access point. Thank you in advance for your cooperation in our effort of providing a stable connection in the contest venue.

Finally, in either case (with or without a separate wireless LAN access point in your booth), please make sure to set up your system to operate without an internet connection so that the demonstration shall not be affected by the connection status.

**Intellectual Property Rights:**

Please pay special attention not to have any infringement of intellectual property rights. Any rights shall not be violated by the presented software, documents and presentations. At the same time, please make sure to protect the intellectual property rights of your software, documents and presentations. All rights on the developed software, are reserved by each participant. However, the contest organizer may use the following materials for video recording, website, brochure, and educational purposes:

- Any documents and files (the introduction file, the summary file of your entry) submitted to enter the contest.
- Any documents and files (the brochure file, the operation manual, the system configuration, the detailed version of system manual, etc.) submitted for the contest.
- The photos, video clips and presentation slides that are recorded during the contest.
- Submitted data during the competition matches in the contest.

**Duplicate Submission:**

Any developed software should be original. Each participant cannot submit the same software to any other similar contests/competitions.

**(i) Inquiries:**

Any inquiries on the contest can be sent by e-mail to: [naprock@tokyo-ct.net](mailto:naprock@tokyo-ct.net)

## 2. Themed Section

### ***“Light UP the Society with a Torch of Sportsmanship!”***

We selected the theme for the Themed Section on this year's contest as “Light UP the Society with a Torch of Sportsmanship”.

Tokyo has been selected to be an official hosting city for the 2020 Olympics and Paralympic Games. Since the accouplement, people all over the country are working together to make this memorable event successful. As we witnessed after the last Tokyo Olympics in 1964, it opened up a great path in our future; the Japanese economy has grown steadily, the Japanese society has prospered, and Japan has expanded its presence in the international society. We all hope to make the coming 2020 Tokyo Olympics and Paralympic Games to be another great accomplishment for us and make our country grow more positive, confident and proud.

In the same trend, in October, 2015, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) added a Sports Agency under its wing. According to the preamble of the Basic Act on Sports, the aim of the Agency is set to realize "a society in which people are healthy both in body and mind, and lead a cultural lifestyle throughout their lives" through sports. Besides the conventional sports promotion activities, such as further enhancement of Japan's competitiveness in sports and more sports activities for all, it is aiming to apply the power of sports to benefit the country even further. The Agency also thrives to achieve the further longevity of its people, the containment of growing medical expenses, revitalization of the communities, more active international exchange and support, and the further growth of the overall national economy; all through the power of sports.

As we can see from our government's efforts, sports can energize not only us individually but also the society as a whole. In the 28<sup>th</sup> Annual Programming Contest, therefore, we selected “sports” for the theme of this section. Please propose a system which will influence a wide range of users through sports, such as a program which can revitalize a community(s), promote an active international communication or cultural exchange through sports, while helping to maximize “the joy of (playing) sports” or “the excitement of viewing sports” via ICT. We look forward to seeing an exciting program that can thrill the world.

#### **Notes:**

- The participating teams can use their original peripheral devices. However, the usage of the devices will be also judged. Please make sure to set up your devices within your display booth. Also, make sure you can finish setting up your devices in a given time (approx. 40 mins.) on the contest date.
- In the Themed Section, the proposed system is also assessed for its fitness to the provided theme.
- The highest priority is set on the originality of the proposed system for the judgment. At the same time, we will also evaluate the level of programming skill based on its applicability, completeness and other factors.

## 3. Original Section

In the Original Section, we call for the original software that was developed from the original concept and idea of each team.

There has been a great increase in the users of new technologies, such as smartphones and tablets in the recent years, and now another cutting-edge device, such as wearable computers are attracting the consumers worldwide. At the same time, the internet technology has evolved dramatically as seen in the cloud computing and open data. These are a tangible result of how the IoT (Internet of Things) can impact our lives. And in the midst of the changing world, we wonder how the new technologies such as open data and ICT, could take off the restrictions of space and time and connect us further regardless of our physical locations (e.g., work, home or relaxation) as

well as time zones (e.g., day or night, seasons or era). The potential of IoT application is limitless and it may hold a key to bring a breakthrough in our current issues in the field of education, ecology, food supplies, telemedicine and more.

For the applicants of the Original Section, we would like you to take a moment to understand the ever changing world we live in today, and develop a truly original system, a creation of an out-of-the-box thinking. We look forward to being inspired by the many creative and fresh approaches of yours.

**Notes:**

- The participating teams can use their original peripheral devices. However, the usage of the devices will be also judged. Please make sure to set up your devices within your display booth. Also, make sure you can finish setting up your devices in a given time (approx. 40 mins.) on the contest date.
- The highest priority is set on the originality of the proposed system for the judgment. At the same time, we will also evaluate the level of programming skill based on its applicability, completeness and other factors.

## 4. Competition Section

***“Come Find Our True Charm”***

### **Overview of the Competition Section**

For the Competition Section this year, we decided to keep the format as the same puzzle style assignment as last year. It is a tournament in which the contestants put puzzle “pieces” together in a given “frame” and compete for the “speed” and the “accuracy” to complete their answers. Puzzle “pieces” are a polygon wooden piece with straight sides. The competing teams will fill the provided “frame” with these “pieces”. The team which completes the puzzle first wins the game.

In last year’s tournament, some teams had better results by filling in pieces manually, and almost no teams could get the perfect answer. It requires contestants to figure out the completed image while they are quickly filling the pieces into place, according to the completed image. Let’s aim at submitting the perfect answer this year! Put everything you got into this competition—your ingenuity, courage and technical skills. You may be surprised to find out your real power and strength sleeping within you!

### **Overview of the Competition**

- (1) A set of a “frame” and the “pieces” that are cut out from a figure, are given to the competitors.
- (2) It is a puzzle game to fill the “frame” in with the provided “pieces” quickly.
- (3) Some additional information will be provided during the game.
- (4) A team which completes the puzzle with all the “pieces” according to the fewest information wins the game.

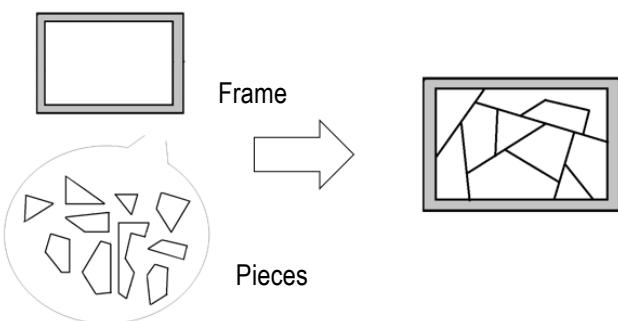


Figure 1: Competition Overview.

### **Grid**

A grid is a square shaped lattice. There are 101 lattices horizontally and 65 dots vertically in each column and row. Each edge of the lattece is 1/4 cm. We call the intersection of the lattices as the “grid dot”. We number each grid dot on a column starting from 0,1,2, all the way up to 100 from left to right,

and we number each grid dot on a row starting from 0,1,2, all the way up to 64 from the top to the bottom. Each grid dot is identified by the coordinates of its column number and row number.

### **Puzzle**

A puzzle consists of multiple divisions, which shapes are formed by multiple straight lines, connecting two grid dots on the grid plane. All the lines meet the other line(s) on a grid dot. A puzzle is made up with multiple divisions which are connected to one another.

### **Piece**

“Pieces” are a set of cut-outs from a sheet of medium density fiberboard (MDF), whose shapes are identical to those of the aforementioned divisions which the puzzle consists of. All “pieces” are a polygon in various shapes, including a dented polygon with a small angle inside of it (囗). There is no piece which has a hollow space in the middle. Each piece is identified with the sets of a column number and a row number of the grid dots, moving clockwise. The grid dots which lie between the grid dots on each end of a straight line are not used to indicate the piece.

A “piece” can contain a maximum of 16 grid dots. The length of each side is 1cm (4 grid dots) or more. A piece can contain a 1cm (4-grid-dot) x 1cm (4-grid-dot) square inside. The maximum number of “pieces” a puzzle can contain is 50 pieces. A piece of 1.5cm (6-grid-dot) x 1.5cm (6-grid-dot) square is always included in every problem.

Figure 2 shows some examples of pieces. Note that these examples show only the format of the pieces and that their sizes are almost half of the actual pieces. The front side and the back side of a “piece” has the same appearance; no distinction is made.

You may mark a “frame” or the “pieces” with a symbol during the match. However, please do so carefully; if the “frame” or the “pieces” are damaged due to the act of marking, the team will be disqualified from the competition.

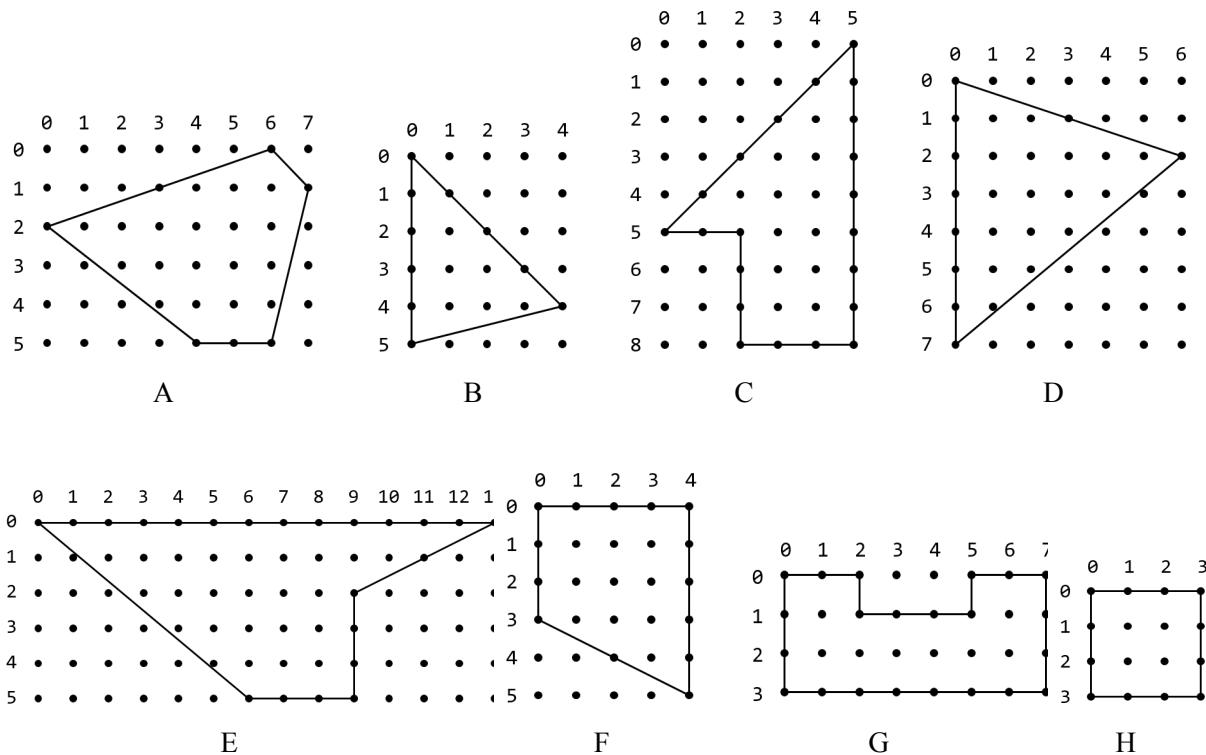


Figure 2: Pieces.

## **Frame**

The “frame” and “pieces” are made of the same material. The “frame” is a 21cm x 29.7cm rectangular. The inner frame matches with the outer lines of the puzzle. The frame’s width is 2 cm or more even at the narrowest point. All pieces can fit into the frame comfortably. Figure 3 shows the example of a frame.

Both “frame” and “pieces” may have 0.2cm errors maximum because of the deformation of the materials or some processing problems. Both of them may come with some minor surface discoloration due to the fabrication process of these on our end. Please check the official web site for the images of the “frame” and “pieces” or refer to the sample “frame” and “pieces” which will be found in your package.

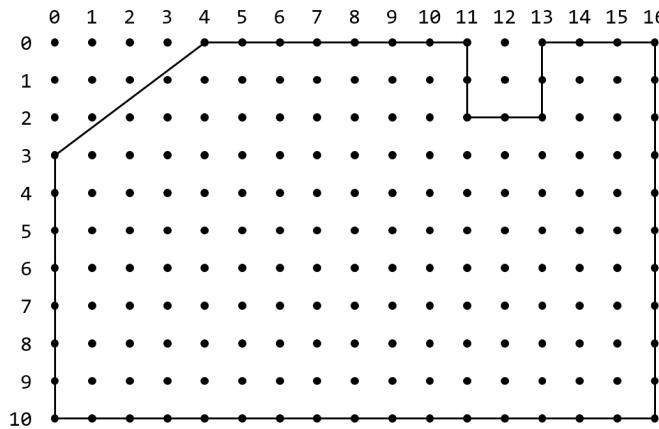


Figure 3: A frame.

## **Method of Distributing the Assignments**

A set of the actual “frame” and “pieces” of the puzzle are provided for the competing teams as an assignment. This year, we will provide the shape information of the frame and all pieces, and also the location information of some pieces to be used as a reference material. The location information is divided into about 4 levels. The information included in each level are different and not duplicated. We call these levels as Level 1, Level 2, and so on. The number of pieces included in each level is different in different games. The location information of all pieces are not always obtained even if all levels of location information is revealed. The rate of the revealed location information depends on the games, but the locations of at least around 80% of the pieces will be provided.

It is up to the participant’s discretion whether the reference is to be used or not. Please note that the final score of a team which used the reference info, is reduced by the points that were given to each reference data used. The location information must be used in the order of levels from the lowest level (Level 1). If the participants use only the higher level information, it will be considered that they used the lower level information as well. The number of location information levels and the points of each reference data will be provided just before the game on the day of the contest.

The reference data will be given as a QR code printed on the paper. Each shape and location information is included in different QR code. The QR code is US-ASCII mode and encoded with the error-correcting level Q (25%). The largest QR code is the version 20 (97 cells x 97 cells). If all information cannot be included in a single QR code, it will be divided into 2 or more QR codes.

## **Format of Shape and Location Information**

The shape information carries all of the information for the pieces of the puzzle. It indicates the number of pieces, the details of each piece and the frame info in order. The frame info and a piece info are partitioned by a “:”. The info starts with the number of grid dots that composes each piece or the

frame, followed by the coordinates of a column number and a row number of each grid dot moving clockwise. Each number is followed by a space. Note that the pieces do not necessarily match with the grid. They may be slided in parallel, rotated around or flipped over, as long as all the apexes are on a grid dot after such geometrical transformations. There is no particular rule for the grid alignment (left-alignment, top-alignment and such) nor the starting point of a grid number (it can start from other than the top-left corner).

If the information is divided into 2 or more QR codes, the number of pieces included in each QR code is described first, followed by the information of each pieces in the QR code. Any information of a single piece cannot be divided into different QR codes. The frame info is described at the end of the last QR code.

The piece location is indicated by the grid dots on the puzzle, in the same format as the shape information file, that is, in the format where the number of pieces is described first, followed by the location of grid dots for each piece on the puzzle.

An example of the shape information and examples of the location information are shown in Fig. 4 and Fig. 5, respectively.

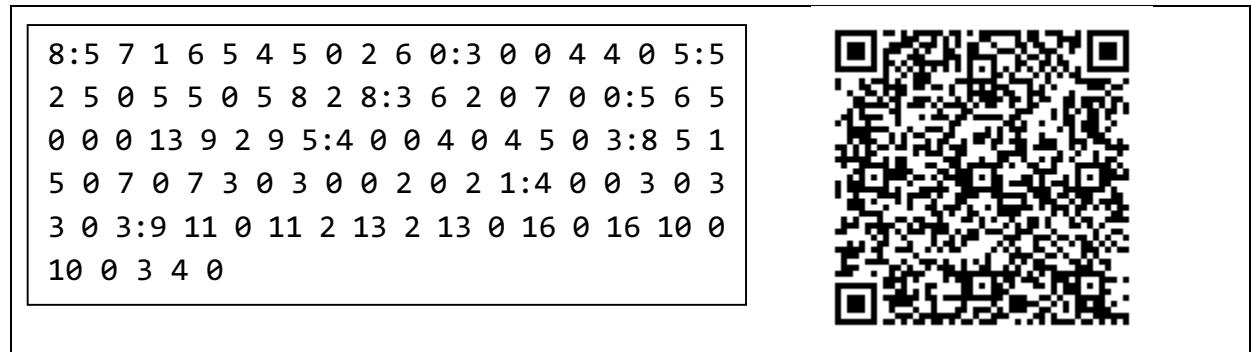


Figure 4: An example of the shape information.

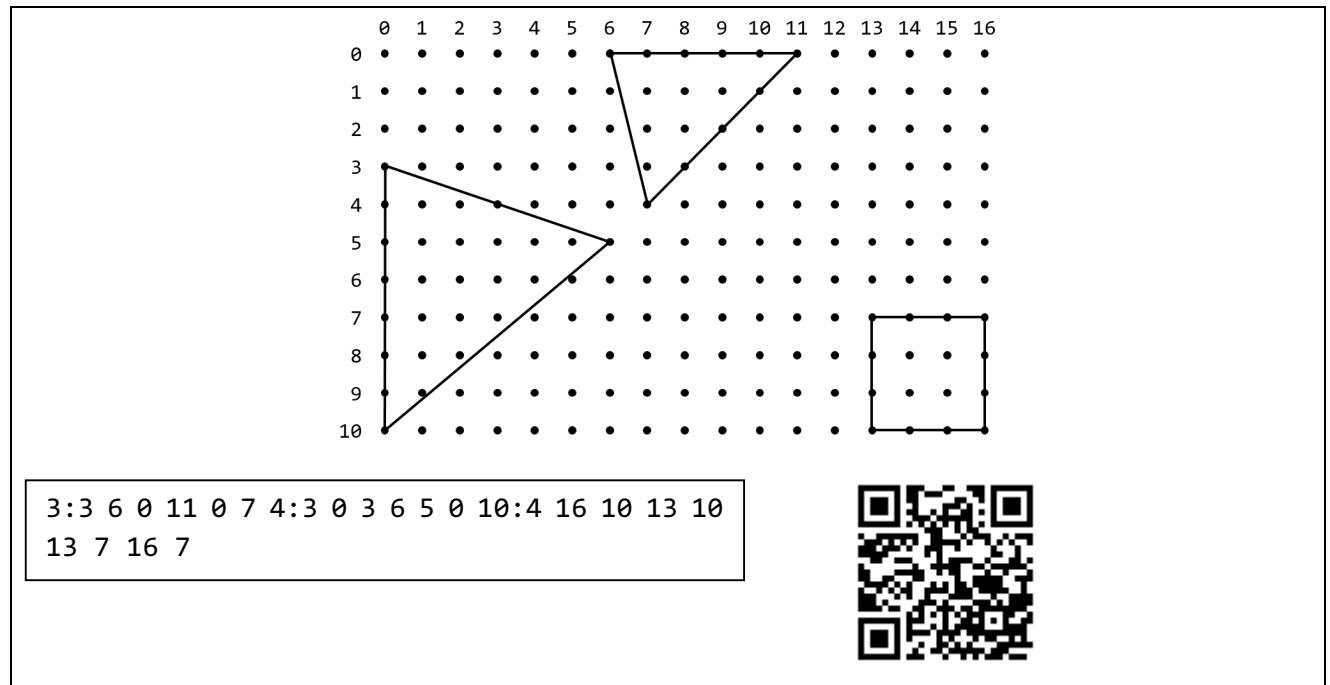


Figure 5 (a): Level 1.

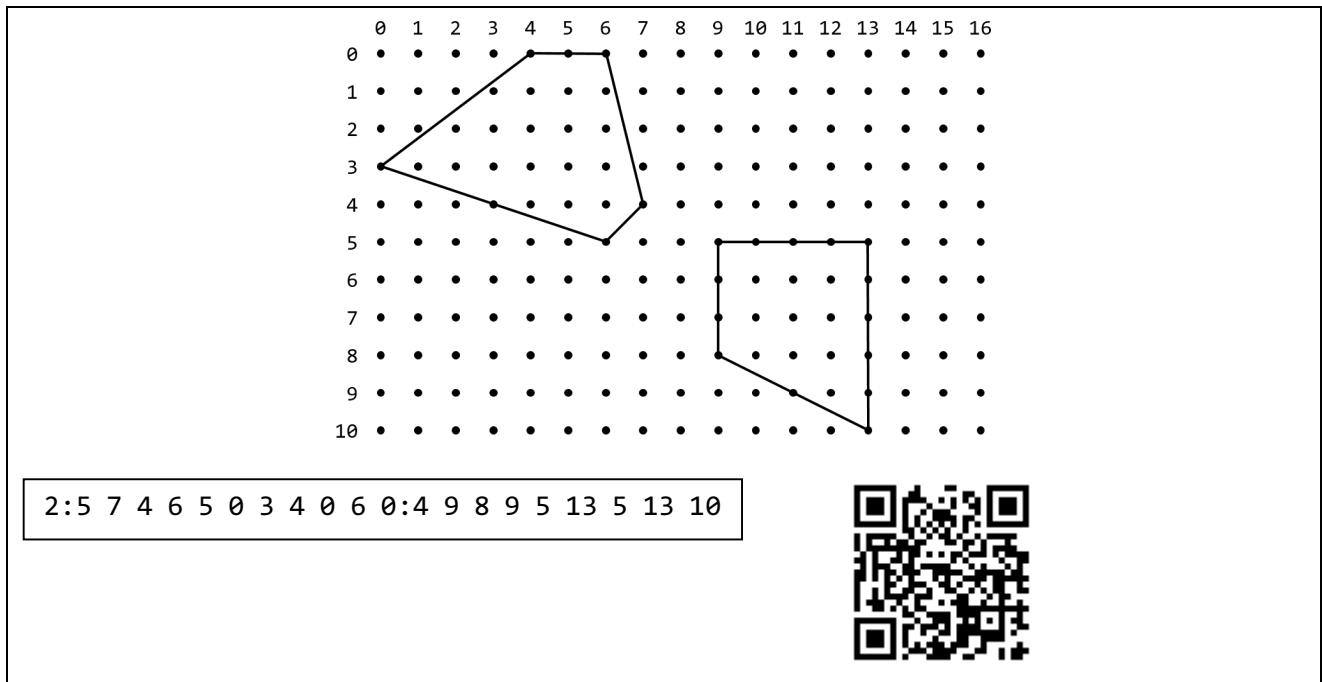


Figure 5 (b): Level 2.

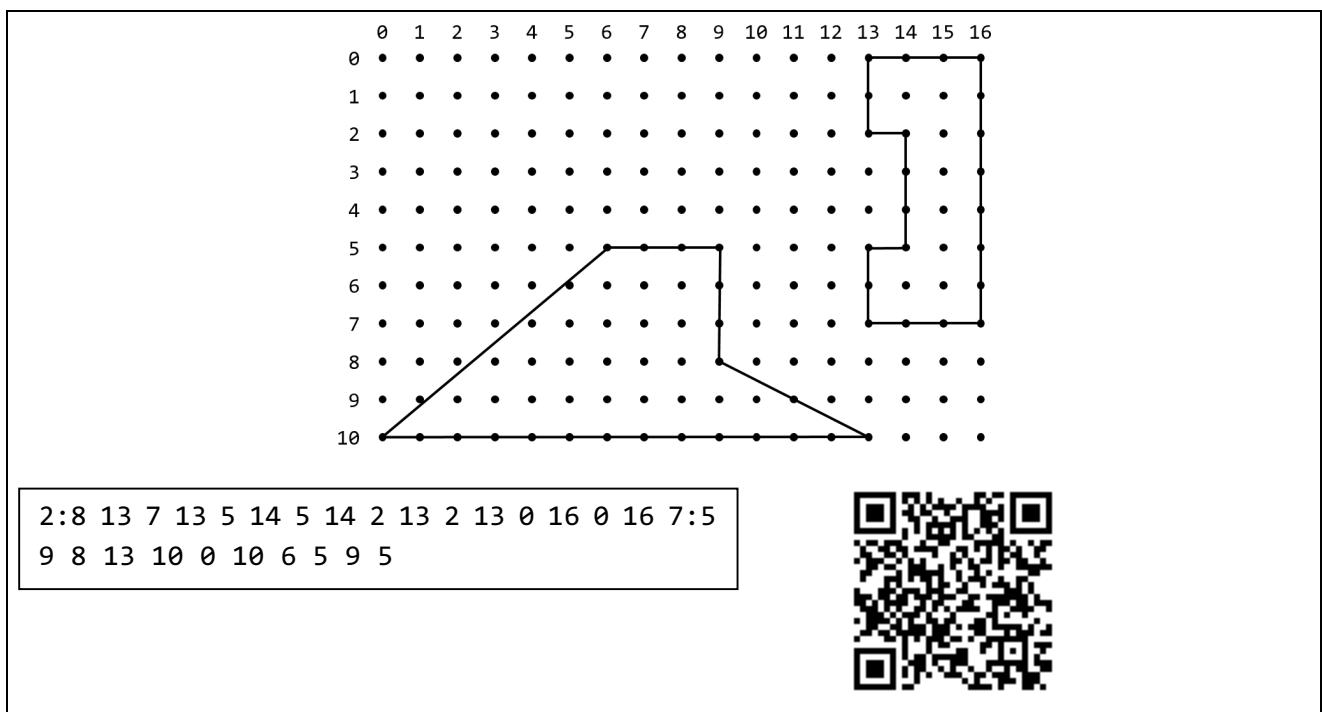


Figure 5 (c): Level 3.

Figure 5: Examples of the location information.

## Answering Method

The answer is the final condition in which the “frame” is filled with the “pieces”. Each team is responsible to inform us when they are ready to submit an answer once their puzzle is completed. You may submit your answer without filling up all the spaces. Please remember that you are not allowed to touch your answer (neither piece nor frame) once the answer is submitted.

## **Competition Booth**

We will provide a table (90cm (D) x 180cm (W)) for each team, which consists of two 45cm (D) x 180cm (W) tables adjacent to each other. The competition booth includes the table space plus a 100cm area from the back end of the table. The participants cannot leave the competition booth during the competition.

The answering pedestal will be set at the point where the center of the pedestal is 60 cm from the right end of the table. Any pieces fallen out of the competition booth are invalid. Even if the pieces are fallen inside the booth, they may be invalid in some cases where it is not clear what team is the owner of such fallen pieces, for example.

## **Time Limit**

The time limit is set per assignment. It is going to be anytime between 10 to 30 minutes. The time limit of each match will be announced at the final round before each match starts.

## **Tournament Procedures**

- 1 assignment is given per match. The maximum of 18 teams will compete in a match.
- The set of a frame and pieces as well as the shape and location information printed on the papers are set up on each booth by the organizer before the match.
- The participants can start to place the pieces as soon as the game starts.
- If necessary, the shape and location information can be used at any time after the game starts.
- Please close the lid after the pieces are put together and you are ready to submit the answer, and declare that your team is done.

## **Method of Team Ranking**

A winner is determined based on the following factors in order:

1. The team that filled in all the “pieces” precedes others.
2. If there are more than one team that filled in all the “pieces”, the team with less deduction points (due to the usage of the reference data) precedes other(s).
3. If the deducted points are the same amongst the above teams, the team that answered the fastest precedes other(s).
4. If the above teams finished at the same timing, the winner is decided by rolling the dice.\*
5. If there are more than one team that could not fill in all the “pieces”, the winner is decided by rolling the dice.\*

\* A team with the higher sum of dots on the dice precedes.

## **Other Rules and Notes**

### ***Computer***

There is no limit on the number of computers and other devices that each team can bring for the competition.

### ***Allowed Devices and the Set-up***

We will provide two power outlets per booth/team (a total of about 150W). If you need more outlets, you can bring your own power outlet such as a power strip. Please make sure the total power does not exceed 150W.

There is no restriction on the type of device used for the competition as long as they won't disturb and interfere with the other participating teams. However, communication with anyone outside is not allowed with any of the devices including a personal computer. This includes exchanging information with the other participating teams. If we detect any unauthorized communication, the teams will be disqualified from the competition.

It is allowed to place the devices on the floor under the table, as long as they are placed inside of the table's width or depth.

Depending on the layout of the booths, the status of the devices such as the computer screens, may be exposed to the other teams. Also, depending on the layout, the lighting may slightly vary per booth. Please be aware of this point if you are planning to take images.

#### ***Act of Interference***

Any act of interference shall be prohibited during the contest. If the organizer judges that a team interrupted the progress of a competition, judgment or other activities of other teams, or if they performed other prohibited acts in the competition, the team will be disqualified to compete. An act of emitting an extremely strong light, may also be considered as an act of interruption. A disqualified team shall receive the lowest rank in the tournament.

#### ***Rematch***

In case any trouble is experienced on the organizer's side, teams may compete again with another assignment.

#### ***Judgment***

During the competition, members of the judgment committee may come to view the participants and their working status in the booth for judgment purposes.

#### **Display of the Booth Status**

During the competition, the response status, the results, the participants, the booths of the teams, and other conditions, will be filmed, recorded and projected on the screen or other media by a video camera or another device.

#### **Contact**

Please send your inquiries to the following contact. Note that your inquiries as well as the answers may be released on our website. Any inquiries which might affect the result of the contest may be also released on our website.

**Deadline to contact: 17:00 (JST), May 19th, 2017 (Fri)**

**Email: naprock@tokyo-ct.net**

- ※ Please make all contacts to us, through your mentor who represents your team. Provide your name and where you belong (name of your school and the department). If this information is not provided, an answer may not be provided.
- ※ No answer will be made for those contacted after the deadline.