



## The 14<sup>th</sup> NOI (2011) INSTRUCTIONS FOR CONTESTANTS

1. You are to solve FIVE (5) tasks within FOUR AND A HALF (4.5) hours.
2. This is an open-book competition. You may bring in your reading material. However, no electronic devices (except calculators and watches) and storage devices are allowed during the competition.
3. The following are provided:
  - a. Task statements with an overview page (to be distributed at the start of the competition)
  - b. An A4 lecture pad and a pen
4. Read the task statements and overview page carefully, and observe all instructions.
5. If you have any doubts on the task statements, you may seek clarification **within the first two hours of the competition** through NOI's online web submission system. You are advised to carry on working instead of waiting for the answer. The answer will be either one of
  - YES,
  - NO,
  - ANSWERED IN TASK DESCRIPTION (EXPLICITLY OR IMPLICITLY) - The task description contains sufficient information. The contestant should read it again carefully,
  - INVALID QUESTION - The question is most likely not phrased so that a yes/no answer would be meaningful. The contestant is encouraged to rephrase the question, or
  - NO COMMENT - The contestant is asking for information that the Scientific Committee cannot provide.
6. In the event of machine breakdown, or other technical faults, please inform an official immediately. Arrangement will be made to transfer your work to another machine. Time lost in the transfer will be compensated for.
7. You are free to go to the Food Station and toilet, but not anywhere else. You are not to discuss the tasks with anybody outside the competition room.
8. You are not allowed to leave the competition venue (except to the Food Station and restrooms) within the first hour and the last 15 minutes of the competition. If you would like to leave early, please inform an official. You will be asked to fill in a declaration form.
9. No extra time will be given to submit your solutions at the end of the competition. Please submit your solution through the web submission system before the end of competition.

10. The 14<sup>th</sup> NOI Prize-giving Ceremony will be held on 12 March 2011, Saturday, 11:00am – 1:00pm, at School of Computing, National University of Singapore. Please check the NOI's website at <http://www.comp.nus.edu.sg/~noi> for further announcements. All contestants are required to attend the ceremony.

## THINGS YOU MUST NOT DO

11. Do not bring in electronic devices (except calculators and watches) and your own storage device. If you have these with you, you must keep them in your bags. Set your pager and mobile phone to silent mode and keep them in your bag.
12. Do not start reading, writing, or typing until you are told to do so.
13. Do not communicate with other contestants during the competition (including at the Food Station and restrooms).
14. Do not share your username and password with anyone else.
15. Do not eat or drink in the competition room.
16. Do not play games, meddle with files outside your home directories, or carry out any activities unrelated to NOI (such as hacking, web surfing, etc.).
17. Do not leave the competition room (except to go to the toilet or the Food Station) before the end of the competition.
18. Breach of any of the rules above will render you disqualified from the competition.

## PROGRAMMING RELATED INSTRUCTIONS

19. **Do not read in any input in a fashion that requires interactions with the user.** For example, do not program a “Press a key to continue” sequence. This will create difficulty for grading and render your program un-gradable.
20. **Do not read input from file. Do not write output into a file or standard error.** All input and output must be from the *standard input* and to the *standard output* only. Your program must not create any intermediate files or write to the standard error.
21. You may assume that the input data is correctly formatted.
22. Follow the instructions carefully and exactly. If the required output is a capital letter (e.g. ‘A’), writing a lowercase letter is incorrect (e.g. ‘a’).
23. Your code to solve one task must be written as a single source file. DO NOT split your code into multiple files.

## INSTRUCTIONS ON USING THE SYSTEM

24. Each contestant will be equipped with an Intel PC with Fedora 8, running the Gnome desktop environment.
25. Your computer would have been switched on when you enter the competition room.
26. You will also be given a username and password for using the NOI's online web submission system.

27. The following compilers are available: `fpc 2.2.`, `g++ 4.1.2`, `gcc 4.1.2`.
28. You may use any of the available editors/IDEs (`vim`, `gvim`, `emacs`, `xemacs`, `kwrite`, `kate`, `kdevelop`, `lazarus`, `geany`) to edit your source code. If you are not familiar with any of these editors, we recommend `geany` as it is simple and easy to use.
29. You can run your executable by typing its name on the command line. You should redirect the data file to your executable using the "<" operator. For example, if you have a data file called `INPUT` in the current directory and your executable is named `foo`, you run the following on your command line:

```
./foo < INPUT
```

30. When you are ready to submit your program, use a web browser (Firefox is available) to connect to the NOI's submission website at  

```
http://noi-1.comp.nus.edu.sg/
```
31. Use the username and password given to you to login and submit your code.
32. The source code you are submitting should end in `.c` for C programs, `.cpp` for C++ programs and `.pas` for Pascal programs.
33. You may submit as many times as you want. Only the latest submitted solution of each task is judged in the competition. We will not judge based on the source code in your home directory on the PC.
34. Remember to save your work regularly. You can retrieve previously submitted solution from the server (thus, this serves as a form of backup).
35. If you experience an infinite loop, press **Ctrl-C** to stop the loop.
36. If your PC hangs, please seek help from the officials.

## INSTRUCTIONS ON COMPILING USING COMMAND LINE

(If you prefer to use an IDE such as `kdevelop` and `geany`, you may skip this section)

37. The compilers available are `gcc`, `g++` and `fpc`. To compile your code with a particular compiler, just type the name of the compiler, followed by the file name of your code. For example:

```
gcc foo.c
```

38. By default the executable created is named `a.out`. You can change the name by using the `-o` option. For instance, to name the executable `foo`, you run

```
gcc foo.c -o foo
```

```
g++ foo.cpp -o foo
```

```
fpc foo.pas -ofoo
```

**CAUTION:** DO NOT put the name of your source code as the argument to `-o`. Your source code would be overwritten if you do so.

39. To generate information you can use with the debugger `ddd` or `gdb`, you can compile with the `-g` option.

```
gcc -g foo.c
```

```
g++ -g foo.cpp
```

```
fpc -g foo.pas
```

## LAYOUT OF COM1 BASEMENT

