

Recruitment in Taiwan 2016 Programming Examination

Write program(s) for examination 1 or 2 attached, in accordance with the following rules;

Rules

1 - Write program for **one examination at least**.

You can write programs for BOTH of two examinations, or you can write program for examination 1 or 2.

2 - Use either **Java or C++**.

3 - Use attached code skeleton.

***Do not change** package names written in the attached document.

*Any classes or functions in the skeleton **MUST NOT BE** changed.

(name, variable number, parameters and return value)

*You can add new classes and/or functions if you need.

4 - **English** only.

Use English or derivatives of English for all class names, identifiers, method names, comments, etc...

5 - **Do not copy** the source code from the other students or from Web sites.*

6 - Do not show your source code to other students or on any Web site.*

* If we find the same source code with the others', we will not accept it.

7 - Submission is allowed **only once**.

Test your program(s) by yourself carefully in various cases before submission.

8 -Use UTF-8 file encoding.

9 -Don't use restricted functions such as system.

Environment

<Java>

Compile and execute in Java7 environment.

You can use the classes of Java Platform Standard Edition 6/7 API Specification but CAN NOT use other libraries.

<C++>

Compiler : GCC 4.8.2 or later(The latest version of g++ by apt-get).

You CAN use only C++ Standard Library. Do not use other libraries.

Dead line : In 3 days

Note

***Faster code is better**

Implementation with faster execution will lead to higher scores.

***Comment out the code for comments output and debug when you submit source code.**

(Page 1)

Online site for pre-verification

You can use our online site for pre-verification before you submit the source code formally.

On this site, you can verify your source code by the following things;

- compile
- the most simple test case.

URL: <http://examchk.worksap.com/> user id: student / password: G0Ywxch3

How to submit

Submit your program(s) according to the following procedure.

1, Go to <http://career.worksap.com/> and select "Apply now" button.



2, Input your information as directed, then you will find the upload page of the Programming Examination.

*When you upload your program, please select which Exam you are going to submit and which language you have used.

(e.g.1) In case of choosing Examination1 in C++

Exam1_Java	×
Exam1_C++	○
Exam2_Java	×
Exam2_C++	×

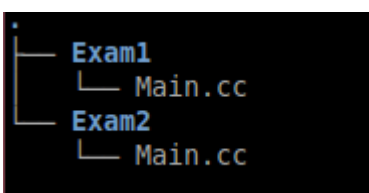
(e.g.2) In case of choosing Examination2 in Java

Exam1_Java	×
Exam1_C++	×
Exam2_Java	○
Exam1_C++	×

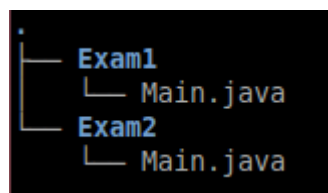
(e.g.3) In case of writing both examinations, examination1 in C++ examination2 in Java

Exam1_Java	×
Exam1_C++	○
Exam2_Java	○
Exam1_C++	×

3, You are supposed to submit a zip file, with folder structure described as below.



OR



You can choose either C++ or Java to solve each problem.

Next Step : Regarding the interview

If you pass the programming examination, we will interview you including live coding in front of our engineer with your source code for the examination.

We are looking forward to your Submission.

※Submission Process

1. Go to <http://career.worksap.com/>

Click **Apply now**

2. Click **Show details**

3. Input your personal information.

And then click **Next**

4. Before upload your programming exam, check which exam you have done and what language you used

career.worksap.com

WORKS APPLICATIONS GLOBAL RECRUITMENT Business Overview Jobs at WAP Your Benefit Meet Our People **Apply now**

R&D Engineer

Engineers who survey the market and envision our clients' needs a decade ahead – they make it happen.

Research & development engineer

Product-out development to realize the ideal.

Your goal as an R&D engineer is clear and simple: develop products that surprise and inspire, and deliver them to our clients. Rather than meeting the needs of individual clients, you are expected to envision where the market as a whole is headed, and to map out a vision that proactively responds to its future needs, thus creating new value. The products that you create all the way up from the product's grand design will speed up our clients' business procedures and enable them to achieve their next steps confidently.

Select a Job category .

R&D Engineer

Show details

[Q4-2-1] Faculties & Schools (NUS) * Please choose your faculty or school at NUS.

[Q4-2-2] College (NTU) * Please choose your college at NTU.

[Q4-2-3] Schools (SMU) * Please choose your school at SMU.

[Q4-2-4] Faculties (SUTD) * Please choose your faculty at SUTD.

[Q5] Major * What is your major?

Ex. Computer Science, Computer Information Science, Business, etc...

CS

Next **Back**

Page up

If you are ready to submit your programming exam, please attach here. If not, you can submit later accessing "MyPage", so please skip this process. We will send you the "MyPage" information later.
If you submit your exam, please choose which Exam you have chosen and which language have used below. If you are not ready to submit, select "X".

<Our selection process>
Seminar → Programming Exam → Interview
You might have not attend our company session and have not gotten "Programming Exam", you can download from "MyPage". We will inform you how to log in "MyPage" later, please wait a moment.
Thank you.

Exam1_Java *	<input type="radio"/> <input type="radio"/> <input type="radio"/> X	Clear
Exam1_C++ *	<input type="radio"/> <input type="radio"/> <input type="radio"/> X	Clear
Exam2_Java *	<input type="radio"/> <input type="radio"/> <input type="radio"/> X	Clear
Exam2_C++ *	<input type="radio"/> <input type="radio"/> <input type="radio"/> X	Clear

Submit Programming Exam Attach your programming exam here.

ファイルを選択 選択されていません

ファイルを選択 選択されていません

ファイルを選択 選択されていません

Next **Back**

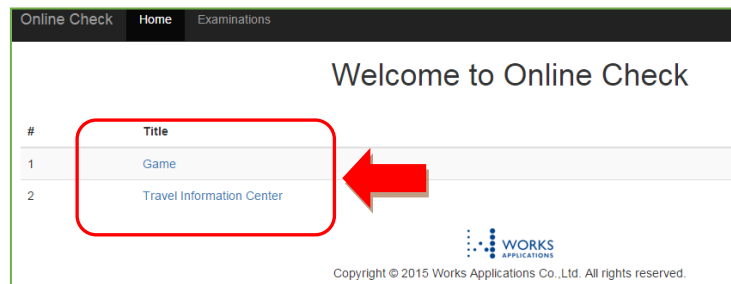
※ Program test method

1. Go to <http://examchk.worksap.com/>
ID: student Pw: G0Ywxch3
2. Choose the exam you have done.
3. Paste your source code, and then click

Verify Solution



Verification Result: Accepted



[Exam1] Game

Jeff loves playing games, Gluttonous snake(an old game in NOKIA era) is one of his favourites. However, after playing gluttonous snake so many times, he finally got bored with the original rules.

In order to bring new challenge to this old game, Jeff introduced new rules :

1. The ground is a grid, with n rows and m columns($1 \leq n, m \leq 500$).
2. Each cell contains a value v ($-1 \leq v \leq 99999$), if v is -1 , then this cell is blocked, and the snake can not go through, otherwise, after the snake visited this cell, you can get v point.
3. The snake can start from any cell along the left border of this ground and travel until it finally stops at one cell in the right border.
4. During this trip, the snake can only go up/down/right, and can visit each cell only once.

Special cases :

- a. Even in the left border and right border, the snake can go up and down.
- b. When the snake is at the top cell of one column, it can still go up, which demands the player to pay all current points , then the snake will be teleported to the bottom cell of this column and vice versa.

After creating such a new game, Jeff is confused how to get the highest score. Please help him to write a program to solve this problem.

Input

The first line contains two integers n (rows) and m (columns), ($1 \leq n, m \leq 500$), separated by a single space.

Next n lines describe the grid. Each line contains m integers v_i ($-1 \leq v_i \leq 99999$)

$v_i = -1$ means the cell is blocked.

Output

Output the highest score you can get. If the snake can not reach the right side, output -1 .

Limits

- Memory limit per test : 256 megabytes
- Time limit per test : The faster the better

Compile & Environment

C++

```
g++ Main.cc -o Main -fno-asm -Wall -lm --static -std=c++0x -DONLINE_JUDGE
```

Java

Java 7

Maximum stack size is 50m

Skeleton Code

Java

```
public class Main {  
    public static void main(String[] args) {  
        // TODO: Implement your program  
    }  
}
```

C++

```
int main(){  
    // TODO: Implement your program  
}
```

Sample Test

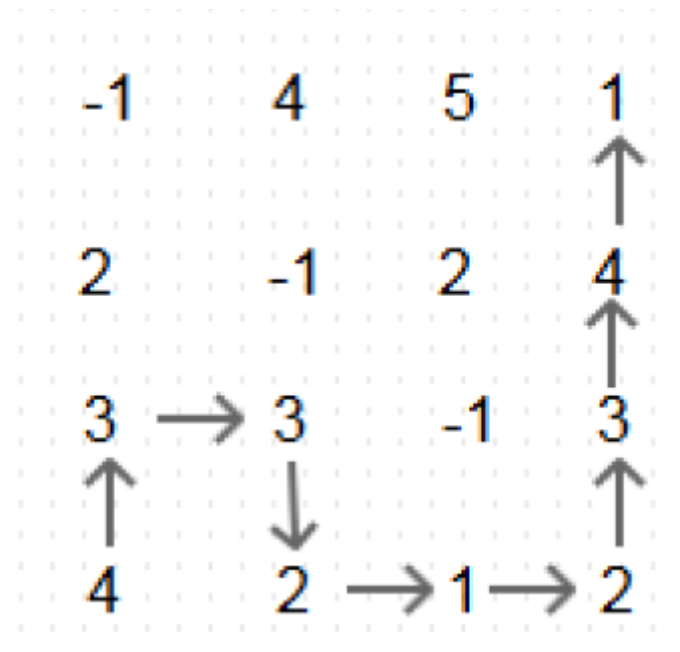
Input

```
4 4  
-1 4 5 1  
2 -1 2 4  
3 3 -1 3  
4 2 1 2
```

output

```
23
```

Path is as shown below



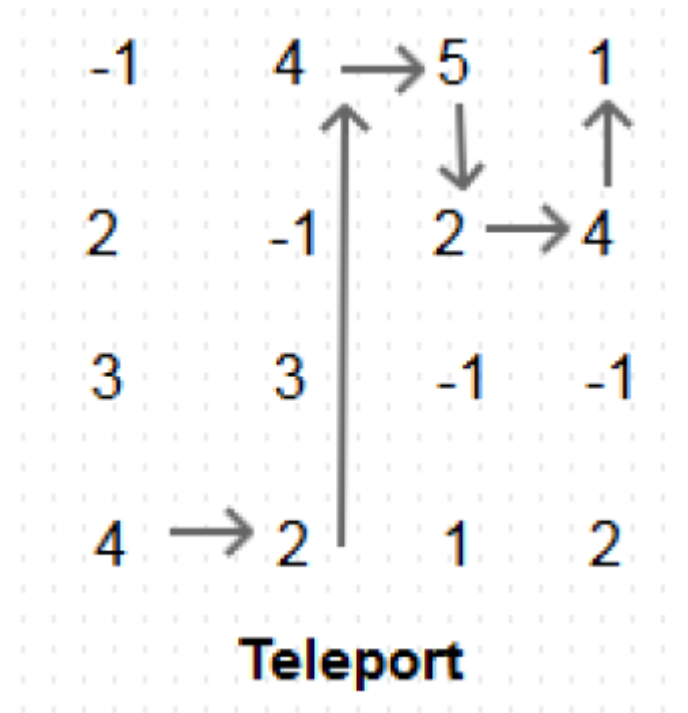
Input

```
4 4
-1 4 5 1
2 -1 2 4
3 3 -1 -1
4 2 1 2
```

output

```
16
```

Path is as shown below



[Exam2] Travel Information Center

Aps Island has many cities. In the summer, many travellers will come to the island and attend festive events in different cities. The festive events in Aps Island are crazy. Once it starts, it will never end. In the following sentences, the cities which have festive events are called festive cities.

At the beginning, only city No. 1 is festive city. If a new city becomes festive city, the government will tell the information center about this news.

Everyday, the information center will receive many inquiries from travellers from different cities of this land. They want to know the closest festive city, and calculate the distance (If current city has festive event, the distance is 0).

Due to the growing number of the travellers, the information center is overloaded. The government wants to fix the problem by developing a system to handle the inquiries automatically.

As a fact, cities in Aps Island are connected with highways(bidirectional, length of every highway is 1). Any two cities are connected directly or indirectly, and there is ONLY one path between any 2 cities.

Input

There are two integers in the first line, n ($2 \leq n \leq 10^5$) and m ($1 \leq m \leq 10^5$), n is the number of cities in the Aps Island and m is the number of queries. The coming $n-1$ lines are the highways which connect two cities. In the line, there are two integers a_i and b_i ($1 \leq a_i, b_i \leq n, a_i \neq b_i$), representing two cities. Each line means the highway connecting the two cities.

Next m lines are inquiries from travellers or news from government. Each line has two integers q_i and c_i ($1 \leq q_i \leq 2, 1 \leq c_i \leq n$). If $q_i = 1$, the government announces a new festive city c_i . If $q_i = 2$, you have to find and print the shortest distance from the city c_i to the closest festive city.

Output

Results from each ($q_i = 2$) Questions. Print every result with a new line.

Limits

- Memory limit per test: 256 megabytes
- Time limit per test: The faster the better

Compile & Environment

C++

```
g++ Main.cc -o Main -fno-asm -Wall -lm --static -std=c++0x -DONLINE_JUDGE
```

Java

Java 7

Maximum stack size is 50m

Skeleton Code

Java

```
public class Main {  
    public static void main(String[] args) {  
        // TODO: Implement your program  
    }  
}
```

C++

```
int main(){  
    // TODO: Implement your program  
}
```

Sample Test

input

```
5 5  
1 2  
1 3  
3 4  
3 5  
2 5  
2 3  
1 3  
2 3  
2 4
```

output

```
2  
1  
0  
1
```

