

Workshop 4

All Tasks given below must be submitted via Blackboard submission system by the deadline. Create a zip folder which contains all the **.java** files of the tasks and screen shots for the output. **There will 10% per day deduction on the late submission of the workshop.**

Task 1

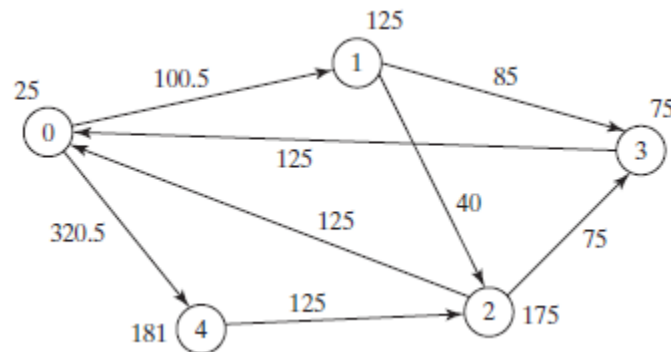
Write an application that counts the number of keywords in a Java source file. If a keyword is in a comment (include line comment or block comment) or in a string, don't count it. Pass the Java file name from the command line. Assume the Java source code is correct and line comments and paragraph comments do not overlap. Properly handle all the exceptions in the program.

You can find list of java keywords on the following link,

<https://www.w3schools.in/java-tutorial/keywords/>

Task 2

Banks lend money to each other. In tough economic times, if a bank goes bankrupt, it may not be able to pay back the loan. A bank's total assets are its current balance plus its loans to other banks. The diagram below shows five banks. The banks' current balances are 25, 125, 175, 75, and 181 million dollars, respectively. The directed edge from node 1 to node 2 indicates that bank 1 lends 40 million dollars to bank 2.



If a bank's total assets are under a certain limit, the bank is unsafe. The money it borrowed cannot be returned to the lender, and the lender cannot count the loan in its total assets. Consequently, the lender may also be unsafe, if its total assets are under the limit.

Write a program to find all the unsafe banks. Your program reads the input as follows.

1. It first reads two integers **n** and **limit**, where **n** indicates the number of banks and **limit** is the minimum total assets for keeping a bank safe.
2. It then reads **n** lines that describe the information for **n** banks with IDs from **0** to **n-1**.

The first number in the line is the bank's balance, the second number indicates the number of banks that borrowed money from the bank, and the rest are pairs of two numbers. Each pair describes a borrower. The first number in the pair is the borrower's ID and the second is the amount borrowed. For example, the input for the five banks in above picture is as follows (**note that the limit is 201**):

Number of banks: 5

Minimum asset limit: 201

Bank # 0 → Balance: 25 → Number of banks Loaned: 2 → Bank ID: 1 → Amount: 100.5 → Bank ID: 4 → Amount: 320.5

Bank # 1 → Balance: 125 → Number of banks Loaned: 2 → Bank ID: 2 → Amount: 40 → Bank ID: 3 → Amount: 85

Bank # 2 → Balance: 175 → Number of banks Loaned: 2 → Bank ID: 0 → Amount: 125 → Bank ID: 3 → Amount: 75

Bank # 3 → Balance: 75 → Number of banks Loaned: 1 → Bank ID: 0 → Amount: 125

Bank # 4 → Balance: 181 → Number of banks Loaned: 1 → Bank ID: 2 → Amount: 125

The total assets of bank 3 are (75 + 125), which is under 201, so bank 3 is unsafe. After bank 3 becomes unsafe, the total assets of bank 1 fall below (125 + 40). Thus, bank 1 is also unsafe.

The output of the program should be

Unsafe banks are 3 and Bank 1

Task 3

Rewrite the program given in the "Java Networking Slides" where single client and server are presenting a scenario of chatting. Your program should introduce two clients to chat.

Implement one server that serves both the clients. Sample output below,

Server

```
MultiThreadServer started at Thu Dec 14 04:53:15 EST 2017
```

```
Connection from Socket[addr=/127.0.0.1,port=57327,localport=8000] at Thu Dec 14 04:53:36 EST 2017
```

```
Connection from Socket[addr=/127.0.0.1,port=57328,localport=8000] at Thu Dec 14 04:54:34 EST 2017
```

```
ali: hi how are you?
```

```
mahboob: i am fine
```

```
mahoob: How are you?
```

Client 1

Enter you name: ali

Enter Text: hi how are you?

Enter Text:

Client 2

Enter you name: mahboob

Enter Text: i am fine

Enter Text: How are you?

Enter Text: