*Question 1*  
Write a class **Triangle**, which has two member variables **base** of type int, and **height** of type int.

Write a constructor which initialises the base and the height of a Triangle instance.

Write a method **getArea**() that returns the area of the Triangle as a double.

Write a method **show**(), to print the dimensions and area of the Triangle instance.

Write a method **compare**(Triangle t1, Triangle t2), which determines compares the area of two given Triangle objects (hint: recall the Float class compare() method used in Lab #2).

In the main method of the Triangle class, obtain user input for the Triangle's base and height.    
If the user wishes to do a comparison, ask for the dimensions of Triangle t1 and Triangle t2.

You may like to use the control loop from Lab #2 Question #2.  
  
Test cases:

|  |  |
| --- | --- |
| Test Input | Expected Output |
| base = 10, height = 10 | 50.0 |
| base = 0, height = 10 | Error - base / height cannot be 0 or negative |
| base = 10, height = -100 | Error - base / height cannot be 0 or negative |
| t1 base = 10, height = 50 t2 base = 5, height = 100 | t1 and t2 are equal |
| t1 base = 100, height = 50 t2 base = 5, height = 100 | t1 is larger |
| t1 base = 10, height = -50 t2 base = 5, height = 100 | Error - base / height cannot be 0 or negative (The error message should appear right after t1's dimensions have been entered) |

*Question 2*

Implement the Equipment class from the IFCS, according to the following class diagram:

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| --- |
| Equipment |
| - id : String  - description: String |
| + Equipment(id:String, desc:String)  + getId() : String  + getDesc() : String |

Write an IFCSManager class to maintain an array of Equipment objects. (Hint: refer to Lab #2 Question 2).

The IFCSManager will

* add new Equipment instances
* remove an Equipment instance specified by its id
* given an id, report if the Equipment instance resides in the Lab
* display the list of Equipment instances in the Lab.

Test cases:  
add new Equipment instances

|  |  |
| --- | --- |
| Test Input | Expected Output |
| id = 1234567 description = oscilloscope | Equipment added to Lab |
| id = *null* description = oscilloscope | Error - id cannot be null |
| id = *1239999* description = null | Error - description cannot be null |

remove Equipment instances

|  |  |
| --- | --- |
| Test Input | Expected Output |
| id = 1234567 | Equipment removed from Lab |
| id = *null* | Error - id cannot be null |
| id = *abc123* | Equipment with id abc123 cannot be found. |

report Equipment instances

|  |  |
| --- | --- |
| Test Input | Expected Output |
| id = 1234567 | Equipment available in  Lab |
| id = *null* | Error - id cannot be null |
| id = *abc123* | Equipment not in Lab. |

display the list of Equipment instances in the Lab

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| --- |
| Expected Output |
| id=123456, desc=oscilloscope id=123457, desc=multimeter id=123460, desc=bread-board id=123468, desc=signal generator |