TP08

Midterm (1.A)

TP08.1. Sequence of numbers up and down

Write program in Java that ask user to input positive number from keyboard and display numbers from 01 to inputted number then back down to 01. For example:

```
Input positive number: 12b
Input only positive number: -7
Input positive number: 9
01 02 03 04 05 06 07 08 09 08 07 06 05 04 03 02 01
```

Note: As you can see in above example you need to check all possible cases including Not-A-Number and Number less than 1.

TP08.2. Cost calculation

A grocery shop has special promotion for their guests as a New Year gift. The promotion is based on how much customer buy the products. The conditions are listed below:

- Discount 2$ if bought between 20$ to 30$
- Discount 10% if bought from 30$ and less than 80$
- Discount 15% if bought from 80$ and less than 150$
- Discount 20% if bought from 150$ and less than 300$
- Discount 25% if bought from 300$ and above

Create a class to encapsulate all logic related to cost, discount, and total price in this shop. (All fields must be private, methods and constructors can be public)

Write a program to calculate how much money a customer needed to pay due to given amount of buy (cost).

Example 1:

```
Input total buying cost: 35$
Input total buying cost: -30
Cost must be positive.
Input total buying cost: 20

     Total cost:  20.00 $
 Total discount:   2.00 $
------------------------
  Total payment:  18.00 $
```

Note: you need to check invalid inputs like 35$ is not valid because we accept only real numbers. The -30 is not valid because cost can't be negative.

Example 2:

```
Input total buying cost: 85

     Total cost:  85.00 $
       Discount:     15 %
 Total discount:  12.75 $
-------------------------
  Total payment:  72.25 $
```

Example 3:

```
Input total buying cost: 10

     Total cost:  10.00 $
 Total discount:   0.00 $
-------------------------
  Total payment:  10.00 $
```

Note: the 4th example the total buying cost is less than $20, so they get 0 discount.

TP08.3. Rescue the Princess

Create a Java game follow the story as below:

"Once upon a time, there is a beautiful princess living in harmony in a pretty kingdom. One day, there is a black wizard captured the princess. A hero of such a game should answer the questions and take decisions that influence game result."

Your task is to propose a hero action option and depending on his choice to build a situation. The hero must pass the 3+ tests of honor to rescue the princess. The 3+ questions are listed below:

Questions	Result
Q1. You enter the first room, here it is a lot of gold. Whether you will take it? (A. Yes, B. No)	A. Gold remains to you, but you have ruined test. GAME is over!!! B. Congratulation, you have passed the first test of honor! (Game goes on to Q2)
Q2. (Only if pass Q1) You pass in a following room. It is full of diamonds, whether you will take the diamonds? (A. Yes, B. No)	A. Diamonds remain to you, but you have ruined the second test B. Congratulation, you have passed the second test of honor!!! (Game goes on to Q3)
Q3. (Only if pass Q2) You enter the third room. A person is attacking by a dragon! To move further, not paying to them of attention? (A. Yes, B. No)	A. You try to pass past, but the dragon notices your presence and transforms you into ashes. You are dead!!! GAME is over!!! B. Congratulation, you have passed all tests of honor. Princess gets to you!!! (Hero becomes the future king)

Make sure that each Question is an object of a class. Question should have question text, possible answers, correction answer, and may have method to check answer. You can suggest other structure if you like to.