Labsheet 7 (Control Structures Loops)

Question 1
Write a program which **continuously** asks the user to key in **5** numbers and finds the square root of these numbers.
The program stops if the user types in a negative number.

Question 2
Write a program which uses a **while** loop to find out the value of a bank deposit, P, after **n** years given that the annual interest on the deposit is **r** % (Assuming no withdrawals are made during those 10 years).
P, n and r are to be input by the user.
The program must display the value of the Bank deposit after each year in an appropriate format.
Note that this problem involves the calculation of compound interest.

Question 3
Write a program which used nested loops to display the following:

1**1<->2**1<->3**1<->4**1<->5**1
1**2<->2**2<->3**2<->4**2<->5**2
1**3<->2**3<->3**3<->4**3<->5**3

Question 4: The Christmas Tree:
Write a program which displays the following given the input below:

When x=1	When x=2	When x=3
Output:	Output:	Output:
*	* **	* ** ***

Question 5
Modify the program above such that it displays the following:

When x=1	When x=2	When x=3
Output:	Output:	Output:
* * **	* * **	* * **

	* ** ***	* ** *** * ** *** ****

Hint: determine the pattern before writing the code.

Question 6
Using **while** loops, write programs that calculates the following:
   a) Sum of the first n counting numbers: $1 + 2 + 3 + .. + n$
   b) Sum of the first n odd numbers: $1 + 3 + 5 + .. + n$
   c) The number of times a whole number can be divided by 2 (using integer division) before reaching 1.
Please note that the number **n** should be entered by the user.

Question 7
Write a program that uses a while loop to determine how long it takes for an investment to double at a given interest rate. The input will be an annualized interest rate, and the output is the number of years it takes an investment to double.
Note: the amount of the initial investment does not matter; you can use MUR 100.

Question 8
Write a program that prints the following menu indefinitely until a **0** (zero) is entered:

```
********************************
********Counting in Maths*********
********************************
1.Sum of first n counting numbers
2.Sum of first nth odd numbers
3.Number of division by two
0.Exit
********************************
Enter your choice (0-3):
```

For the other choices, i.e., from 1 to 3, the following is to be performed after requesting the user for the appropriate inputs:
Choice 1: Sum of the first n counting numbers: $1 + 2 + 3 + .. + n$
Choice 2: Sum of the first n odd numbers: $1 + 3 + 5 + .. + n$
Choice 3: The number of times a whole number can be divided by 2 (using integer division) before reaching 1.
You are also required to validate user inputs as necessary.
(Hint: You can make use of the codes written for **Question 6** as functions which are called based on the user's choice.)