EXERCISE 3: CONTROL FLOW STATEMENTS

1. Suppose that when you run the following program you enter the input 2, 3, 6 from the console. What is the output?

   x, y, z = eval(input("Enter three numbers: "))

   print("sorted" if x < y and y < z else "not sorted")

2. Rewrite the following **if** statements using conditional expressions:

```
ages = 15
if ages >= 16:
    ticketPrice = 20
else:
    ticketPrice = 10
print(ticketPrice)
```

```
count = 20
if count % 10 == 0:
    print(count)
else:
    print(count, end = " ")
print("Done")
```

3. Rewrite the following conditional expressions using **if/else** statements:

   a. score = 3*scale if x > 10 else 4*scale

   b. print(i if number % 3 == 0 else j)

4. Given different scored marks of students. We need to find grades. The final grade will be out of 100%. The grading breakdown is listed below:

Weekly Homework:	20%
Quizzes:	10%
Assignments :	20%
Final Exam:	50%

Grade will be calculated according to:

1. score >= 9.0 :	"A+"
2. 8.5 <= score < 9.0 :	"A"
3. 8.0 <= score < 8.5 :	"B+"
4. 7.0 <= score < 8.0 :	"B"
5. 6.5 <= score < 7.0 :	"C+"
6. 6.0 <= score < 6.5 :	"C"
7. 5.0 <= score < 6.0 :	"D+"
8. 4.0 <= score < 5.0 :	"D"

5. Write a program that lets the user enter a year and then determines whether it is a leap year. All leap years are divisible by four, but multiples of 100 are not leap years unless they are also a multiple of 400.

   For example:

   2016 was a leap year, but 1900 was not

   2000 was a leap year, as it is a multiple of 400, but 2100 will not be a leap year.

6. Develop a program to play a lottery. The program randomly generates a two-digit number, prompts the user to enter a two-digit number, and determines whether the user wins according to the following rules:
   a. If the user's input matches the lottery in the exact order, the award is $10,000.
   b. If all the digits in the user's input match all the digits in the lottery number, the award is $3,000.
   c. If one digit in the user's input matches a digit in the lottery number, the award is $1,000.
7. Write a program that lets user enter a integer number N and calculate the sum of EVEN numbers from 0 to N-1.
8. Create a simple guessing game. Program generates a random integer number between 1 and 50. The program prompts the user to enter numbers continuously until it matches the randomly generated number. For each user input, the program reports whether it is too low or too high, so the user can choose the next input intelligently.
9. Find all divisors of a natural number.
10. Write a program that lets user enter a integer number N and display:
    a. A box like one below:

```
Enter a number: 5
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
```

```
Enter a number: 5
* * * * *
*       *
*       *
*       *
* * * * *
```

    b. A triangle like one below:

Enter a number: 5 * ** *** **** *****	Enter a number: 5 ***** **** *** ** *	Enter a number: 5 * ** *** **** *****

c. A triangle like one below:

```
Enter a number: 5
      *
     ***
    *****
   *******
  *********
```

d. Shape "K" like one below:

```
Enter a number: 5
1 2 3 4 5
1 2 3 4
1 2 3
1 2
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```