

Celebal Assignment Week – 1

Questions: Create lower triangular, upper triangular and pyramid containing the "*" character.

Algorithm:

1. Define a class **Triangle** with three methods:
 - lower_triangular(rows):
 - Loop from 1 to rows.
 - Print i asterisks (*) in the i-th row.
 - upper_triangular(rows):
 - Loop from rows down to 1.
 - Print i asterisks in the i-th row.
 - pyramid(rows):
 - Loops from 1 to the rows needed
 - Print Spaces (rows – 1) followed by i asterix with trailing spaces
2. Create an object t1 of class Triangle.
3. Repeat infinitely using a loop:
 - Repeat infinitely using a loop:
Display menu options:
 1. Lower Triangular
 2. Upper Triangular
 3. Pyramid
 4. Exit
 - Take the user input for choice
 - If choice is from 1 to 3
Ask for the number of the rows
Call the respective method
 - If the choice is 4
Exit the loop
 - Else
Show the Invalid choice

Screenshot of the solution:

```
# Create lower triangular, upper triangular and pyramid containing the "*" character.

#I will create a menu driven program to create lower triangular, upper triangular and pyramid containing the "*" character.
#1. Lower triangular
#2. Upper triangular
#3. Pyramid
#4.Exit

class Triangle:
    #This is the Triangle class which will contain methods to print different patterns
    def lower_triangular(self, rows):
        #This method will print a lower triangular pattern
        for i in range(1, rows + 1):
            #This loop will iterate from 1 to the number of rows
            for j in range(1, i + 1):
                #This inner loop will iterate from 1 to the current row number
                print("*", end=" ")
            #Printing "*" character with a space at the end
            print()

    def upper_triangular(self, rows):
        #This method will print an upper triangular pattern
        for i in range(rows, 0, -1):
            #This loop will iterate from the number of rows to 1
            for j in range(1, i + 1):
                #This inner loop will iterate from 1 to the current row number
                print("*", end=" ")
            #Printing "*" character with a space at the end
            print()

    def pyramid(self, rows):
        #This method will print a pyramid pattern
        for i in range(1, rows + 1):
            #This loop will iterate from 1 to the number of rows
            print(" " * (rows - i), end="")
            # Printing spaces for pyramid alignment
            for j in range(1, i + 1):
                #This inner loop will iterate from 1 to the current row number
                print("* ", end="")
            #Printing "*" character with a space at the end
            print()

t1 = Triangle()
# Create an instance of the Triangle class
# Start a loop to display the menu and perform actions based on user input
```

```
while True: # This will create a menu driven program to create lower triangular, upper triangular and pyramid containing the "*"
character.
    print("Menu:")
    print("1. Lower Triangular")
    print("2. Upper Triangular")
    print("3. Pyramid")
    print("4. Exit")

    choice = int(input("Enter your choice: ")) # Taking input from the user for the choice of operation
    # Based on the user's choice, call the appropriate method from the Triangle class

    if choice == 1: # If the user chooses 1, we will call the lower_triangular method
        rows = int(input("Enter the number of rows for Lower Triangular: "))
        t1.lower_triangular(rows) #Calling the lower_triangular method to print the pattern
    elif choice == 2: # If the user chooses 2, we will call the upper_triangular method
        rows = int(input("Enter the number of rows for Upper Triangular: "))
        t1.upper_triangular(rows) # Calling the upper triangular method to print the pattern
    elif choice == 3: # If the user chooses 3, we will call the pyramid method
        rows = int(input("Enter the number of rows for Pyramid: "))
        t1.pyramid(rows) # Calling the pyramid method to print the pattern
    elif choice == 4: # If the user chooses 4, we will exit the program
        break
    # Exit the loop and end the program
    else:
        print("Invalid choice, please try again.")

    print() # Print a newline for better readability
```

Output:

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\Celebal_Assignments> python -u "d:\Celebal_Assignments\WEEK1\Triangle_Printing.py"
Menu:
1. Lower Triangular
2. Upper Triangular
3. Pyramid
4. Exit
Enter your choice: 1
Enter the number of rows for Lower Triangular: 5
*
* *
* * *
* * * *
* * * * *
```

```
Menu:
1. Lower Triangular
2. Upper Triangular
3. Pyramid
4. Exit
Enter your choice: 2
Enter the number of rows for Upper Triangular: 5
* * * * *
* * * *
* * *
* *
*
*
```

```
Menu:
1. Lower Triangular
2. Upper Triangular
3. Pyramid
4. Exit
Enter your choice: 3
Enter the number of rows for Pyramid: 5
      *
     * *
    * * *
   * * * *
  * * * * *
```