

# Addis Ababa institute of Technology

## Center of Information Technology and Scientific Computing

### Fundamentals of computer science and programming

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#### *Lab5 Iteration*

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#### Write pseudocode then draw flowchart finally code

1. Write a python program that accepts a number and prints its factorial
2. Write a python program that allows the user to input two numbers, computes their product and print out the product. Assume multiplication operation is not primitive (not allowed) operation for the computer that you are writing the program. i.e. you are not allowed to compute the product by directly multiplying the numbers. In other words, your program should compute the product by repeated addition method.
3. Write a python program that accepts a positive number and prints the sum of the digits in the number. i.e. if the number is 576, it should print  $18 = 5 + 7 + 6$ .
4. Write a python program that accepts a number and prints the sum of its factors.
5. Write a python program that determines if a given number is prime number or not.
6. Write a python program that finds the average, maximum, minimum, and sum of n numbers input by the user.
7. Write a python program that generates a random number in the range 0 to 100 and prompts the user to guess and enter the number continuously until the user's input matches the randomly generated number. The program should inform the user if his/her guess is less/more than the random number. if the user can't guess the value by entering at most 7 guesses the program should print **GAME OVER**

**BONUS:** stop accepting more guesses. Find a strategy that always results in a win (i.e guess based on the less/greater clues)? Why does it always result in a win?

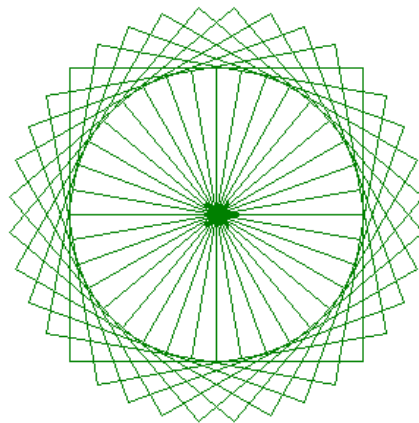
## Back to Turtle

1. Modify the function that draws a square to use loop.
2. Write a function that draws a square using input parameters

**x, y:** x position and y position

**length:** length of the side of the square

3. Write a program that draws the picture below using the square function written in question number 2



4. Write a function that could plot any regular polygon with equal side length given parameters
  - Number of sides
  - Side length
  - Starting point

(Hint: for a regular polygon the rotation angle is given by the formula

$$360/\text{number\_of\_sides}$$

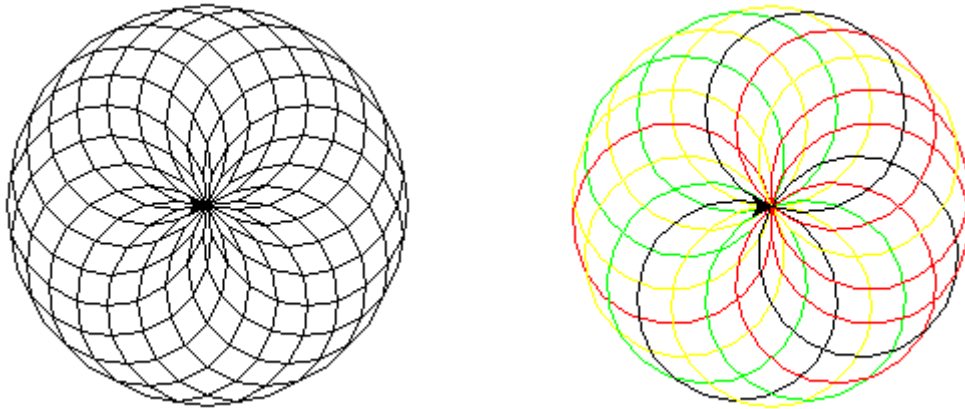
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5. Turtle has a circle function that takes radius as an input

```
import turtle
t = turtle.Turtle()

t.circle(radius)
```

Write a program using the turtle module that draws the picture below



Use the following function to get random colors for the circles

```
def get_random_color():
    import random
    color = '#'
    for a in range(0,6):
        r = random.randint(0,14)
        if r >= 10:
            color += chr(ord('a') + (r-10))
        else:
            color += str(r)
    return color
```

6. Modify the above program to fill the circles with different colors



Use

```
<turtle_name>.fillcolor(<random color>)
```

# where the turtle name is the one you gave for the turtle and the random color you can get from  
# get\_random\_color function

```
<turtle_name>.begin_fill()
```

# where the turtle starts filling the color

```
<turtle_name>.end_fill()
```