

# Lab 05 : Stars and Triangles

Tuesday, Feb 11th

## Objectives:

- Additional practice with looping and conditionals
- 

## Introduction

Once again, this week I will ask you to work with a partner of your choice. You will turn in a SINGLE answer sheet for both partners. As a reminder, you should...

- Be working together
- Only be working at ONE computer
- Both people should work and you should share duties. For example, one partner runs the computer for activity A while the other partner tells him/her what to do and writes any answers on the "answer" sheet. When you reach the end of Activity A you should change roles.

Failure to follow these guidelines may cause you to lose points for this activity.

---

## Activity A : Printing out a simple sequence

Enter the following code into an editor in python.

```
x = 0

while x<10:
    print(x)
    x=x+1

print()
print("Final value of x is",x)
```

Run this code.

[Q1] What happens?

Modify the previous code to look like this instead:

```
x = 0

while x<10:
    print(x,end=' ')
    x=x+1

print()
print("Final value of x is",x)
```

Run this code.

[Q2] How is the output from this code different than the output from the previous code?

---

## Activity B : Printing out a row of stars

We are going to play with creating a type of art today called [ASCII art](#). This type of computer art consists of arranging printable characters on the screen in an artistic form. (Think of creating art and shapes on the screen before modern graphics cards.)

The first shape we make today is a simple row of stars.

Write a program that you will save in a file called `starLine.py`.

This program should:

- ask the user for a non-negative integer, which is the total number of stars
  - if the number is invalid, keep prompting the user until a valid number is given
- print out the total number of stars in a row

For example:

```
Please input a positive number: 0
Please input a positive number: -1
Please input a positive number: 5
* * * * *
```

**Note:** Your code **needs** to have the following line in it somewhere:

```
print("*", end=' ')
```

(This line will print one star at a time.)

Hint: While you might be tempted to use a while loop, a for loop is actually easier in the long run....

Save this code as **starLine.py** and upload it into eLearning:

- Log into eLearning
- Go to this class
- Click on the "Lab Submission" link on the left menu
- Click on the "Lab05" folder
- Upload the files to their proper locations.

[SIG1] Please show **starLine.py** to an instructor BEFORE moving on

---

# Activity C : Printing out a left-justified right triangle

Modify your previous code to use nested loops so that it prints out multiple lines of stars, which happen to look like a left-justified right triangle! Write a loop around your previous loop code to run it multiple times with different numbers of stars. Your code should prompt for a positive height, and re-prompt if a positive number was not entered.

For example:

```
Please input a positive height: -8
Please input a positive height: 8
*
* *
* * *
* * * *
* * * * *
* * * * * *
* * * * * * *
* * * * * * * *
```

Hint 1: The height is the number of times the outer loop should run.

Hint 2: The inner loop prints out one line of stars, starting with one star on the first line and incrementing the number of stars by one each time it runs.

Save this code as **leftTriangle.py** and upload it into eLearning:

- Log into eLearning
- Go to this class
- Click on the "Lab Submission" link on the left menu
- Click on the "Lab05" folder
- Upload the files to their proper locations.

[SIG2] Please show **leftTriangle.py** to an instructor BEFORE moving on

---

# Activity D : Printing out a right-justified right triangle

In Activity C, you printed out a left-justified right triangle. Now I want you to think about writing a right-justified right triangle! For example:

```
Please input a positive height: 5
      *
     * *
    * * *
   * * * *
  * * * * *
```

Each line is actually a mixture of spaces and stars.

[Q3] How does the height of the triangle relate to the number of spaces and stars printed on each line?

Save this code as **rightTriangle.py** and upload it into eLearning:

- Log into eLearning
- Go to this class
- Click on the "Lab Submission" link on the left menu
- Click on the "Lab05" folder
- Upload the files to their proper locations.

[SIG3] Please show **rightTriangle.py** to an instructor.

Don't forget to hand in your answer sheet to the professor or TA before you leave!