ITI1120D – Assignment 3
(100 points)

**Purpose:**

To allow you to exercise with a logical thinking process to formulate algorithms, and to implement the algorithms using the Python Programming Language. The logic will include inputs and outputs, looping, conditional statements (if and else), and functions. This is an individual assignment.

**Prerequisite knowledge:**
You can generate a uniformly distributed random number in Python by:

```
from random import randint
print(randint(0,9))
```

**Questions:**

Write a separate Python program for each of the following:

a. Create a method as such:

   getRandomNumber(int x, int y)

   Which gives you back a randomly generated integer in the range [x-y] (inclusive of x and y). For example, if you call getRandomNumber(5,100), it will give you back a single random number in the range [5-100].

   **Hint**: You simply add a number to randint to shift the range of values you get back.

   Make sure you write a small program to test the usability of your getRandomNumber.

b. Using loops, create a method as such:

   drawLine(char c, int n)

   The method will take a character *c* and draw it *n* times on a single line.

   For example if you call drawLine ('*', 5); it will draw *****.

   Your method will only print a maximum of 50 characters on a line, so if the method is called with a negative value for *n*, or a value for *n* that is greater than 50, print the entire 50 characters on a line.

   Note: print('*', end='') will print the character without a new line at the end.

For example, if you call drawLine('*', -1); or drawLine('*', 51); the method will print 50 stars on a line.

**Postcondition**: the cursor is always on a new line after the function is executed.

Make sure you test drawLine using code in your program.

c. Create a program that uses at least one loop, and the drawLine method in the previous question to print the following figure (this is half a Christmas tree!):

```
*
**
***
****
*****
******
*******
********
*********
**********
**
**
**
**
**
**
**
**
**
**
**
```

Hint, print the upper part of the tree first, then print the lower part (the stem).

For the future, **do not submit**, can you draw the entire Christmas tree?

d. Write a function substr(stringA, StringB) that returns true if StringA is a subset of StringB, and false otherwise. Make sure you test your function using code. Do not use any built in functions that check whether a string is a subset of another or not. You need to use loops.

You will be graded as follows for each problem (25 points each):

- 15 points for the correctness of the logic.
- 2 points for using meaningful names for variables.
- 2 points for documentation (inserting proper comments).
- 2 points for an efficient implementation of your logic.
- 4 points for a professional judgment of your overall solution.