

## Java Foundations Practices - Section 6

### Problem 1: Validate a Bank PIN

#### Overview

Develop a java program to validate bank PIN of a customer. Use a `while` loop to repeat code until a valid PIN is entered.



#### Task

1. Declare a valid integer PIN.
2. Prompt the user to enter the PIN.
3. In a `while` loop, perform the following steps:
  - Compare the user-entered PIN with the already declared PIN
  - If the entered PIN is not the same, prompt the user to enter the PIN again
  - Repeat the loop until the correct PIN is entered
4. Print a message confirming that the correct PIN has been entered and that the user now has access to their account.

The `ValidatePin.java` file is available to help you get started.

## Problem 2: Displaying Multiples of a Number

### Overview

Develop a java program to calculate the multiples of a given number using a `for` loop.

### Task

Have the user enter a number, and then use a `for` loop to display all the multiples of that number from 1 to 12.

### Expected Output:

```
Choose a number: 7
```

```
7x1 = 7
7x2 = 14
7x3 = 21
7x4 = 28
7x5 = 35
7x6 = 42
7x7 = 49
7x8 = 56
7x9 = 63
7x10 = 70
7x11 = 77
7x12 = 84
```

The `DisplayMultiples.java` file is available to help you get started.

## Problem 3: Programmatic ASCII Art

### Overview

Using text to create a picture is known as ASCII art. In section 2, we made an ASCII art cat. This required us to type every character in the art we wanted to create. In this practice, you'll find a way to draw basic shapes programmatically in customizable sizes.

```
#####  
#      #  
#      #  
#      #  
#####
```

5x4 Rectangle

```
#  
##  
# #  
# #  
####
```

5x5 Isosceles Right Triangle

### Task

Complete the following two methods in `LoopShape.java`:

- `createRectangle()`: This method accepts two arguments for width and height which should be used to print a rectangle
- `createTriangle()`: This method accepts one argument for the size of a leg, which should be used to print an isosceles right triangle

Try changing the value of the arguments you're supplying these two methods from the main method. Make sure your program can successfully draw each shape to a custom size. Additionally, your program must:

- Refuse to draw shapes with any dimension less than 1
- Be able to draw shapes with any dimension equal to 1 (a 1x1 shape should print just a single character)

If the problem seems difficult, remember to break it into smaller challenges such as:

- How do I print a single line that is a variable number of “#” characters wide?
- How do I create a String that begins and ends with a “#”, but has a variable number of spaces in between?

Finishing each smaller challenge is an accomplishment. This problem is as much about understanding loops as it's about understanding how to break a big problem into smaller tasks.

The knowledge you've gained in this section on loops will be very helpful in completing this program. You're free to use whichever type of loop statements you feel would be best. You'll also need to remember a few concepts from previous sections.

The `LoopShape.java` and `LoopShapeTest.java` files are available to help you get started.