Exercises Set 2: Loops in Python

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Please rename the file to include your student roll number.

Please submit the completed work in class at: <https://moodle.bolton.ac.uk/mod/turnitintooltwo/view.php?id=2469815>

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# Problems Using `while` Loops:

## Problem 1: Guess the Number

Problem Statement:

Write a program that asks the user to guess a number between 1 and 10. Keep asking until the correct number (e.g., 7) is guessed.

Expected Output:

Guess a number between 1 and 10: 5

Wrong, try again.

Guess a number between 1 and 10: 7

Correct!

**Pseudocode**

**1. Generate a random number from the range 1 to 10**

**2. Print “Guess a number between 1 and 10: “**

**3. Store the user’s input**

**4. Try to convert the users input from a string to an integer**

**5. If the user’s input cannot be converted to an integer, go to step 6, otherwise go to step 8.**

**6. Print “You did not enter an INTEGER between 1 and 10!”, go to step 2.**

**8. If the number provided by the user matches the randomly generated number, go to step 9, otherwise, go to step 10.**

**9. Print “Correct!”, go to step 11.**

**10. Print “Wrong! Try Again!”, go to step 2.**

**11. End program**

**Program**

**Flowchart**

## 

## Problem 2: Counting Up

Problem Statement:

Write a program that uses a `while` loop to count from 1 to 5 and print each number.

Expected Output:

1

2

3

4

5

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 3: Password Validation

Problem Statement:

Write a program that repeatedly asks for a password until the correct password ("letmein") is entered.

Expected Output:

Enter password: 12345

Incorrect password.

Enter password: letmein

Access granted!

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 4: Sum Until Zero

Problem Statement:

Write a program that keeps asking the user for a number and adds it to a total sum. The program should stop when the user enters 0 and print the total sum.

Expected Output:

Enter a number: 5

Enter a number: 3

Enter a number: -2

Enter a number: 0

Total sum: 6

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 5: Factorial Calculation

Problem Statement:

Write a program that calculates the factorial of a number (e.g., 5) using a `while` loop.

Expected Output:

Enter a number to find the factorial: 5

5! = 120

**Pseudocode**

**Program**

**Flowchart**

# 

# Problems Using `for` Loops:

## Problem 1: Print the First 10 Natural Numbers

Problem Statement:

Write a program that prints the first 10 natural numbers (from 1 to 10) using a `for` loop.

Expected Output:

1

2

3

4

5

6

7

8

9

10

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 2: Print the Multiples of 5

Problem Statement:

Write a program that prints the multiples of 5 from 1 to 50 using a `for` loop.

Expected Output:

5

10

15

20

25

30

35

40

45

50

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 3: Calculate the Sum of a List of Numbers

Problem Statement:

Write a program that calculates the sum of the numbers in a list: `[1, 3, 5, 7, 9]`.

Expected Output:

Sum of list: 25

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 4: Reverse a String

Problem Statement:

Write a program that reverses the string "Python" using a `for` loop.

Expected Output:

nohtyP

**Pseudocode**

**Program**

**Flowchart**

## 

## Problem 5: Print the Squares of Numbers

Problem Statement:

Write a program that prints the square of each number from 1 to 5 using a `for` loop.

Expected Output:

1 squared is 1

2 squared is 4

3 squared is 9

4 squared is 16

5 squared is 25

**Pseudocode**

**Program**

**Flowchart**