Assignment: Mastering While Loops

Instructions:

Complete the following tasks using Python's **while loop**. Write your code for each question and test it to ensure it works correctly. Submit your solutions in Screenshots.

Task 1: Print Numbers from 1 to 10

Write a program that uses a while loop to print the numbers from 1 to 10.

Example Output:
1, 2, 3, 4, 5, 6, 7, 8, 9, 10

Task 2: Sum of Natural Numbers

Write a program to calculate the sum of natural numbers up to `n = 20` using a while loop.

Example Output:
Sum of numbers from 1 to 20 is 210.

Task 3: Guess the Number Game

Write a program that asks the user to guess a number between 1 and 10. Keep asking until they guess the correct number, `7`.

Hint: Use `input()` to get user input.

Example Interaction:

```
Guess a number between 1 and 10: 4
Wrong, try again!
Guess a number between 1 and 10: 7
Correct!
```

Task 4: Count Digits in a Number

Write a program to count how many digits are in a number using a while loop. For example, for the number 12345, the program should print 5.

Hint: Use division by 10 to reduce the number in each iteration.

Task 5: Print Multiples of 3

Write a program that uses a while loop to print all multiples of 3 less than 30.

Example Output:
3, 6, 9, 12, 15, 18, 21, 24, 27

Task 6: Reverse a Number

Write a program to reverse the digits of a number using a while loop. For example, if the input is 1234, the output should be 4321.

Task 7: Remove All Items from a List

Given the list `fruits = ['apple', 'banana', 'cherry']`, use a while loop to remove all items from the list one by one and print the list after each removal.

Example Output:

```
['apple', 'banana', 'cherry']
['banana', 'cherry']
['cherry']
[]
```

Task 8: Fibonacci Series

Write a program to print the Fibonacci series up to `n = 50` using a while loop.

Example Output:
0, 1, 1, 2, 3, 5, 8, 13, 21, 34

Task 9: Keep Doubling Until Exceeding 1000

Write a program that starts with $x = 1$ and keeps doubling its value until it exceeds 1000. Print the value of x in each step.

Example Output:
1, 2, 4, 8, 16, ..., 1024

Task 10: Nested While Loops - Print a Pattern

Write a program to print the following pattern using nested while loops:

Copy code
```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```