Practice Problems

1. Print First 10 natural numbers using while loop

Expected output:

```
1
2
3
4
5
6
7
8
9
10
```

2. Print the following pattern

Write a program to print the following number pattern using a loop.

```
1
1 2
1 2 3
1 2 3 4
1 2 3 4 5
```

3 Calculate the sum of all numbers from 1 to a given number

For example, if the user entered **10** the output should be **55** (1+2+3+4+5+6+7+8+9+10)

Expected Output:

```
Enter number 10
Sum is:   55
```

4. Write a program to print multiplication table of a given number

For example, num = 2 so the output should be

```
2
4
6
8
10
12
14
16
18
20
```

5. Count the total number of digits in a number

Write a program to count the total number of digits in a number using a [while loop](#).

For example, the number is **75869**, so the output should be **5**.

6 Write a program to display all prime numbers within a range

Note: A Prime Number is a number that cannot be made by multiplying other whole numbers. A prime number is a natural number greater than 1 that is not a product of two smaller natural numbers

Examples:

- 6 is not a prime mumber because it can be made by 2×3 = 6
- 37 is a prime number because no other whole numbers multiply together to make it.

Given:

```
# range
start = 25
end = 50
```

Expected output:

```
Prime numbers between 25 and 50 are:
29
31
37
41
43
47
```

1. Print First 10 natural numbers using while loop

```python
# program 1: Print first 10 natural numbers
i = 1
while i <= 10:
    print(i)
    i += 1
```

2. Print the following pattern

```python
print("Number Pattern ")

# Decide the row count. (above pattern contains 5 rows)
row = 5
# start: 1
# stop: row+1 (range never include stop number in result)
# step: 1
# run loop 5 times
for i in range(1, row + 1, 1):
    # Run inner loop i+1 times
    for j in range(1, i + 1):
        print(j, end=' ')
    # empty line after each row
    print("")
```

3 Calculate the sum of all numbers from 1 to a given number

```python
# s: store sum of all numbers
s = 0
n = int(input("Enter number "))
# run loop n times
# stop: n+1 (because range never include stop number in result)
for i in range(1, n + 1, 1):
    # add current number to sum variable
    s += i
print("\n")
print("Sum is: ", s)
```

4. Write a program to print multiplication table of a given number

```python
n = 2
# stop: 11 (because range never include stop number in result)
# run loop 10 times
for i in range(1, 11, 1):
    # 2 *i (current number)
    product = n * i
    print(product)
```

5. Count the total number of digits in a number

```python
num = 75869
count = 0
while num != 0:
    # floor division
    # to reduce the last digit from number
    num = num // 10

    # increment counter by 1
    count = count + 1
print("Total digits are:", count)
```

6 Write a program to display all prime numbers within a range

```python
start = 25
end = 50
print("Prime numbers between", start, "and", end, "are:")

for num in range(start, end + 1):
    # all prime numbers are greater than 1
    # if number is less than or equal to 1, it is not prime
    if num > 1:
        for i in range(2, num):
            # check for factors
            if (num % i) == 0:
                # not a prime number so break inner loop and
                # look for next number
                break
        else:
            print(num)
```