Assignment 02

Variables

1. Write a program that swaps the values of two variables.

Solution:

```
# Initial values of two variables
var1 = 5
var2 = 10

# Swapping the values using a temporary variable
tempvar = var1
var1 = var2
var2 = tempvar

# Printing the swapped values
print("After swapping:")
print("Variable1 =", var1)
print("Variable2 =", var2)
```

```
After swapping:
Variable1 = 10
Variable2 = 5
```

2. Write a program that calculates the area of a rectangle given its length and width.

Solutions:

```
# Input the length and weidth a rectangle
length = float(input("Enter the length of the rectangle: "))
weidth = float(input("Enter the weidth of the rectangle: "))

# Calculate the area of a rectangle
area = length * weidth

print("The area of the rectangle is: ", area)
```

```
Enter the length of the rectangle: 15
Enter the weidth of the rectangle: 5.6
The area of the rectangle is:  84.0
```

3. Write a program that converts temperature from Fahrenheit to Celsius.

Solution:

```
# input temperature value in Fahrenheit
fahrenheit= float(input("Enter temperature in Fahrenheit:" ))

# convert Fahrenheit to Celsius
celcsius = (fahrenheit - 32) * 5/9
```

```
# print the temperature in Celsius
print("Temperature in Celsius: ", celcsius)
```

Output:
Enter temperature in Fahrenheit:100
Temperature in Celsius: 37.77777777777778

4. Write a program that calculates the volume of a sphere given its radius.

Solution:

```
import math
# input the radius of the sphere
radius = float(input("Enter the radius of the sphere: "))

# calculate the volume of the sphere and also here pi= 3.14
volume = (4/3) * math.pi * (radius**3)

# display the calculated volume
print("The Volume of the Spare: ", volume)
```

Enter the radius of the sphere: 180
The Volume of the Spare: 24429024.474314228

5. Write a program that finds the average of three numbers.

Solution:

```
# input three numbers
number1 = float(input("Enter the 1st Number1: "))
number2 = float(input("Enter the 2nd Number2: "))
number3 = float(input("Enter the 3rd Number3: "))

# calculate the average number
average = (number1+number2+number3) / 3

# display the average number
print("The average of the three numbers is: ", average)
```

Output:

```
Enter the 1st Number1: 50
Enter the 2nd Number2: 55
Enter the 3rd Number3: 60
The average of the three numbers is:  55.0
```

Assignment 02

If-elif-else

6. Write a program that determines if a number is even or odd.

Solutions:

```
# input a number
number = int(input("Enter a number: "))

# check whether the number is even or odd
if number % 2 == 0:
   print(number, " is an even number")
else:
   print(number, " is an odd number")
```

7. Write a program that finds the maximum of three numbers.

Solutions:

```
number1 = input("Enter the first number: ")
number2 = input("Enter the second number: ")
number3 = input("Enter the third number: ")

#find the maximum number
max_number = max(number1, number2, number3)

print("The maximum Number: ", max_number)
print("The maximum number among", number1, ",", number2, "and", number3, "is: ", max_number)
```

8. Write a program that determines if a year is a leap year or not.

Solutions:

```
# input a year
year = int(input("Enter a year: "))

# check whether it is Leap Year or not

if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):
    print(year, "is a leap year")
else:
    print(year, "is not a leap year")
```

9. Write a program that determines if a number is positive, negative, or zero.

Solutions:

```
# input a number
number = float(input("Enter a number: "))

# Check wheather it is positive, negative, or zero
if number > 0:
    print(number, "is a positive number")
elif number < 0:
    print(number, "is a negative number")
else:
    print("The number is zero")
```

10. Write a program that calculates the grade based on a given percentage.

Solutions:

```
# input the percentage
percentage = float(input("Enter the percentage: "))

# calculate the grade
if percentage >= 80:
```

```
    grade = 'A*'
elif percentage >= 70:
    grade = 'A'
elif percentage >= 60:
    grade = 'B'
elif percentage >= 50:
    grade = 'C'
elif percentage >= 40:
    grade = 'D'
else:
    grade = 'Fail'

# calculated the grade
print("The grade for:", percentage, "% is:", grade)
```

Assignment 02

For Loop

11. Write a program that prints the first `n` natural numbers.

Solution:

```
n = int(input("Enter the value of n: "))

print("the first", n, "natural numbers are: ")
for i in range(1, n + 1):
    print(i)
```

12. Write a program that calculates the factorial of a number.

Solution:

```
n = int(input("Enter a number: "))

# Initialize the factorization
factorial = 1

for i in range(1, n + 1):
    factorial *= i
print("The factorial of ", n, "is", factorial)
```

13. Write a program that generates a Fibonacci sequence of length `n`.
Solution:

```
n = int(input("Enter the length of the Fibonacci Sequence: "))

fibonacci_sequence = [0, 1]

while len(fibonacci_sequence) < n:
    next_number = fibonacci_sequence[-1] + fibonacci_sequence[-2]
    fibonacci_sequence.append(next_number)

print("The Fibonacci length of Sequence is: ", n)
print(fibonacci_sequence)
```

14. Write a program that checks if a given number is prime or not.
Solution:

```
num = int(input("Enter a number: "))

is_prime = True

if num > 1:
    for i in range(2, int(num ** 0.5) + 1):
```

```
        if num % i == 0:
            is_prime = False
            break
if is_prime and num > 1:
    print(num, "is a prime number")
else:
    print(num, "is not a prime number")
```

15. Write a program that prints the multiplication table of a given number.

Solution:

```
num = int(input("Enter a number: "))

table_length = int(input("Enter a table length: "))

#table_length = 15

print(f"multiplication table for {num}:")

for i in range(1, table_length):
    print(f"{num} x {i} = {num * i}")
```

Assignment 02

While Loop

16. Write a program that finds the sum of all even numbers between 1 and `n`.
Solution:

```
n = int(input("Enter a number (n): "))

even_sum = 0

for i in range (2, n+1, 2):
    even_sum += i

print(f"The sum of even numbers between 1 and {n} is: {even_sum}")
```

17. Write a program that reverses a given number.
Solution:

```
num_str = input("Enter a number: ")  # Input as a string
reversed_num_str = num_str[::-1]  # Reverse the string
```

```
reversed_num = int(reversed_num_str)  # Convert back to an integer
print("Reversed Number:", reversed_num)
```

18. Write a program that checks if a given string is a palindrome.

Solution:

```
string = input("Enter a String: ")

string = string.replace(" ","").lower()

if string == string[::-1]:
   print("The entered string is a palindrome")
else:
   print("The entered string is not a palindrome.")
```

19. Write a program that generates a random number and allows the user to guess it.

Solution:

```
import random

# generate a random number between 1 and 100
secret_number = random.randint(1, 100)

# inlialize variables
```

```
attempts = 0
max_attempts = 10

# start the guessing game
print("Welcome to the Number Guessing Game!")
print(f"Try to guess the secret number between 1 and 100. You have {max_attempts} attempts.")

while attempts < max_attempts:
    # input a guess from the user
    guess = int(input("Enter your guess: "))

    attempts += 1

    if guess == secret_number:
        print(f"Congratulations! You guessed the secret number ({secret_number}) in {attempts} attempts.")
        break
    elif guess < secret_number:
        print("Try a higher number.")
    else:
        print("Try a lower number.")

if attempts == max_attempts:
    print(f"Sorry, you've reached the maximum number of attempts. The secret number was {secret_number}.")
```

20. Write a program that finds the greatest common divisor (GCD) of two numbers.

Solution:

```
import math

number1= int(input("Enter the first number: "))
number2= int(input("Enter the second number: "))

# calculating the GCD using the math library

result = math.gcd(number1, number2)

print(f"The GCD of {number1} and {number2} is {result}.")
```

Submission Guidelines: Upload the code in GitHub and submit the GitHub repository link.

How to Upload? This is the Simple way! & This is the Formal Way!