Netaji Subhash Engineering College

Department of Computer Science & Engineering

B. Tech CSE 2nd Year 3rd Semester

2023-2024

Name of the Course: IT Workshop (Python)

Course Code: PCC-CS393

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Class Roll No.: 103

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Assignment No.: A8_01

Problem Statement:

Create a module to check if a passed string is a palindrome or not. Write a program to find whether a string is a palindrome or not using this module.

Module:

```
def is_palin(s):
    s=s.replace(" ", "").lower()
    return s==s[::-1]
```

Python Code:

```
from plaindrome import *

s = input("Enter a string: ")
if is_palin(s):
    print(f"'{s}' is a palindrome string")
else:
    print(f"'{s}' is not a palindrome string")
```

Sample Output(s):

```
Enter a string: madam
```

'madam' is a palindrome string

Assignment No.: A8_02

Problem Statement:

Create a module to check whether a number is a prime or not. Write a program to find the prime number between two limits using this module.

Module:

```
def find_primes(start, end):
    prime_numbers = []
    for num in range(start, end + 1):
        if num <= 1:
            continue
        is_prime = True
        for i in range(2, int(num**0.5) + 1):
            if num % i == 0:
                is_prime = False
                break
        if is_prime:
            prime_numbers.append(num)
    return prime_numbers
```

Python Code:

```
from prime import *

start=int(input("Enter the Starting Number: "))
end=int(input("Enter the Ending Number: "))
print(f"Prime Numbers between {start} and {end} are:",find_primes(start,end))
```

Sample Output(s):

Enter the Starting Number: 1
Enter the Ending Number: 10
Prime Numbers between 1 and 10 are: [2, 3, 5, 7]

Assignment No.: A8_03

Problem Statement:

Create a module to find the factorial of a number and import the module from the main program to find the factorial of a given number.

Module:

```
def fact(n):
    if n<0:
        print("Not Defined!")
        exit(1)
    if n == 0:
        return 1
    else:
        return n * fact(n-1)
```

Python Code:

```
from factorial import *

n=int(input("Enter the Number: "))
print(f"Factorial of {n} is:",fact(n))
```

Sample Output(s):

```
Enter the Number: 5

Factorial of 5 is: 120
```

Assignment No.: A8_04

Problem Statement:

Write a program to find the mean, median, and standard deviation of a list of random numbers between 1 and 10.

Module:

```
import math
import random

def generate_random_number(min_value, max_value,r):
    return [random.randint(min_value,max_value) for _ in range(r)]

def calculate_mean(numbers):
    return sum(numbers) / len(numbers)

def calculate_median(numbers):
    sorted_numbers = sorted(numbers)
    n = len(sorted_numbers)
    if n % 2 == 0:
        middle1 = sorted_numbers[n // 2 - 1]
        middle2 = sorted_numbers[n // 2]
        median = (middle1 + middle2) / 2
    else:
        median = sorted_numbers[n // 2]
    return median

def calculate_std_deviation(numbers):
    mean = calculate_mean(numbers)
    variance = sum((x - mean) ** 2 for x in numbers) / len(numbers)
    std_deviation = math.sqrt(variance)
    return std_deviation
```

Python Code:

```
from rand import *

mi=int(input("Enter Minimum Number: "))
ma=int(input("Enter Maximum Number: "))
r=int(input("Enter Range of Numbers: "))
num=generate_random_number(mi,ma,r)
print("Generated random numbers:",num)
print("Mean:",round(calculate_mean(num),2))
print("Median:",round(calculate_median(num),2))
```

```
print("Standard Deviation:",round(calculate_std_deviation(num),2))
```

Sample Output(s):

Enter Minimum Number: 2

Enter Maximum Number: 10

Enter Range of Numbers: 5

Generated random numbers: [6, 4, 4, 8, 10]

Mean: 6.4

Median: 6

Standard Deviation: 2.33

Assignment No.: A8_05

Problem Statement:

Write a program to shuffle elements of a list of random numbers between given ranges.

Module:

```
import random

def generate_random_number(min_value, max_value,r):
    return [random.randint(min_value,max_value) for _ in range(r)]

def shuffle_list_elements(input_list):
    random.shuffle(input_list)
    return input_list
```

Python Code:

```
from shuffle import *

mi=int(input("Enter Minimum Number: "))
ma=int(input("Enter Maximum Number: "))
r=int(input("Enter Range of Numbers: "))
num=generate_random_number(mi,ma,r)
print("Original List of random numbers:",num)
print("Shuffled List of random numbers:",shuffle_list_elements(num))
```

Sample Output(s):

Enter Minimum Number: 2
Enter Maximum Number: 10
Enter Range of Numbers: 5

Original List of random numbers: [6, 5, 3, 2, 6]
Shuffled List of random numbers: [6, 3, 5, 6, 2]

Assignment No.: A8_06

Problem Statement:

Write a program to create a list of random numbers using list comprehension.

Module:

```
import random
def gen_random(min_val,max_val,r):
    return [random.randint(min_val,max_val) for i in range(r)]
```

Python Code:

```
from rand2 import *

mi=int(input("Enter Minimum Number: "))
ma=int(input("Enter Maximum Number: "))
r=int(input("Enter Range of Numbers: "))
print(f"List of Random Numbers between {mi} and {ma} are:",gen_random(mi,ma,r))
```

Sample Output(s):

Enter Minimum Number: 1
Enter Maximum Number: 10
Enter Range of Numbers: 5
List of Random Numbers between 1 and 10 are: [3, 1, 1, 2, 4]