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Subject	Python

Assignment on Functions

1. Write a program to demonstrate Nested function.
Ans –

```
def outer_function():
    print("This is outer function.")

    def inner_function():
        print("This is inner function.")

    inner_function()

outer_function()
```

Output :

2. Write a program to calculate factorial of a given number using recursion.
Ans –

```
def factorial(n):
    if n == 0:
        return 1
    else:
        return n * factorial(n - 1)

num = int(input("Enter a number to calculate its factorial: "))

print("Factorial of", num, "is", factorial(num))
```

Output :

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS D:\College\IMCC\Sem_2\Python P\Lab Assigment 3> python .\factorial_recrursion.py
Enter a number to calculate its factorial: 5
Factorial of 5 is 120
PS D:\College\IMCC\Sem_2\Python P\Lab Assigment 3>
```

3. Write a program to create decorators and generators.
Ans –

```
def add_greeting(func):
    def wrapper(*args, **kwargs):
        print("Hey!")
        return func(*args, **kwargs)
    return wrapper

@add_greeting
def say_hello(name):
    return f"Hello, {name}!"

def fibonacci_sequence():
    a, b = 0, 1
    while True:
        yield a
        a, b = b, a + b

fib_gen = fibonacci_sequence()

print(say_hello("Rahul"))

print("Fibonacci sequence:")
for _ in range(10):
    print(next(fib_gen), end=" ")
```

Output :

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
Click here to ask Blackbox to help you code faster
[Running] python -u "d:\College\IMCC\Sem_2\Python P\Lab Assigment 3\decorators_generators.py"
Hey!
Hello, Rahul!
Fibonacci sequence:
0 1 1 2 3 5 8 13 21 34
[Done] exited with code=0 in 0.171 seconds
```

4. Create two different user defined modules and access respective functions from one file to another.
Ans –

Module1.py

```
def greet(name):
    return f"Hello, {name}! \nWelcome to Module 1."

def square(n):
    return n * n
```

Module2.py

```
def calculate_average(numbers):
    return f"{sum(numbers) / len(numbers)}\nWelcome to Module 2."

def cube(n):
    return n ** 3
```

main.py

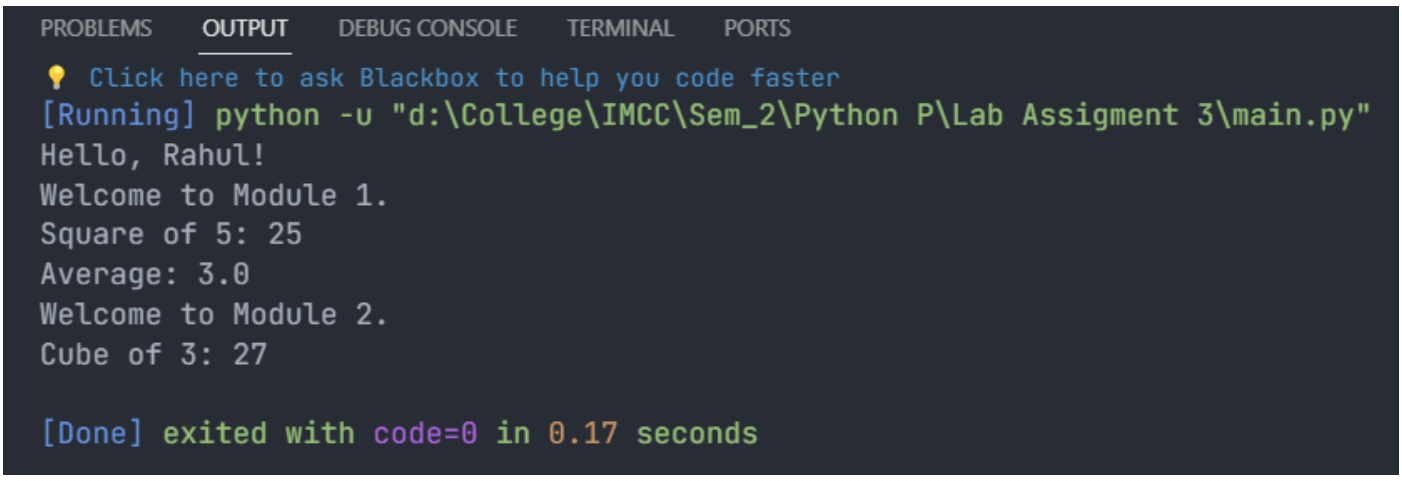
```
from module1 import greet, square
from module2 import calculate_average, cube

def main():
    print(greet("Rahul"))
    print("Square of 5:", square(5))

    numbers = [1, 2, 3, 4, 5]
    print("Average:", calculate_average(numbers))
    print("Cube of 3:", cube(3))

if __name__ == "__main__":
    main()
```

Output :



5. Write a program to access built in functions available in math, random and datetime modules.
Ans –

```
import math
import random
import datetime

def main():
    print("Math module:")
    print("Square root of 16:", math.sqrt(16))
    print("Value of pi:", math.pi)
    print("Ceiling of 3.7:", math.ceil(3.7))
    print("Floor of 3.7:", math.floor(3.7))
    print()

    print("Random module:")
    print("Random integer between 1 and 10:", random.randint(1, 10))
    print("Random choice from a list:", random.choice(["apple", "banana", "cherry"]))
    print("Random floating point number between 0 and 1:", random.random())
    print()

    print("Datetime module:")
    current_time = datetime.datetime.now()
    print("Current date and time:", current_time)
    print("Current year:", current_time.year)
    print("Current month:", current_time.month)
    print("Current day:", current_time.day)

if __name__ == "__main__":
    main()
```

Output :