Lab#11

Questions

Q # 1: write a program with a user-defined function which takes a string as argument and returns reverse of string.

Input:

def reverse\_string(input\_string):

return input\_string[::-1]

user\_input = input("Enter a string: ")

reversed\_string = reverse\_string(user\_input)

print("Reversed string:", reversed\_string)

Output:

Enter a string: Hello

Reversed string: olleH

Q # 2: "lab8\_2.py" with a user-defined function called calculate\_square. The function should take an integer as an argument and return the square of that number. Implement the program to fulfill the following requirements,

Input:

def calculate\_square(number):

return number \*\* 2

user\_number = int(input("Enter an integer: "))

square\_result = calculate\_square(user\_number)

print(f"The square of {user\_number} is {square\_result}")

Output:

Enter an integer: 12

The square of 12 is 144

Q # 3: Write a program with a function that takes two numbers as input and returns the

greatest common divisor (GCD). For two numbers a and b, the GCD is the largest number that divides

both a and b.

Input:

def gcd(a, b):

while b:

a, b = b, a % b

return a

num1 = int(input("Enter the first number: "))

num2 = int(input("Enter the second number: "))

gcd\_result = gcd(num1, num2)

print(f"The greatest common divisor of {num1} and {num2} is {gcd\_result}")

Output:

Enter the first number: 1

Enter the second number: 2

The greatest common divisor of 1 and 2 is 1

Q # 4: Make the user-defined function compute either GCD or least common multiple

(LCM). The function now takes three arguments i.e., two numbers and a string with either “lcm” or “gcd” value and then returns the answer accordingly.

Input:

def compute\_gcd\_lcm(a, b, operation):

if operation.lower() == "gcd":

while b:

a, b = b, a % b

return a

elif operation.lower() == "lcm":

return (a \* b) // compute\_gcd\_lcm(a, b, "gcd")

else:

return "Invalid operation"

num1 = int(input("Enter the first number: "))

num2 = int(input("Enter the second number: "))

operation = input("Enter 'gcd' or 'lcm': ")

result = compute\_gcd\_lcm(num1, num2, operation)

print(f"The {operation.upper()} of {num1} and {num2} is {result}")

Output:

Enter the first number: 2

Enter the second number: 4

Enter 'gcd' or 'lcm': lcm

The LCM of 2 and 4 is 4

Q # 5: Write a program that implements a tic-tac-toe game.

Input:

def print\_board(board):

for row in board:

print(" ".join(row))

def check\_winner(board, player):

for row in board:

if all(cell == player for cell in row):

return True

for col in range(3):

if all(board[row][col] == player for row in range(3)):

return True

if all(board[i][i] == player for i in range(3)) or all(board[i][2 - i] == player for i in range(3)):

return True

return False

def play\_game():

board = [[" " for \_ in range(3)] for \_ in range(3)]

players = ["X", "O"]

current\_player = 0

while True:

print\_board(board)

row, col = map(int, input(f"Player {players[current\_player]}, enter row and column (1-3): ").split())

row -= 1

col -= 1

if board[row][col] != " ":

print("Cell already taken. Try again.")

continue

board[row][col] = players[current\_player]

if check\_winner(board, players[current\_player]):

print\_board(board)

print(f"Player {players[current\_player]} wins!")

break

current\_player = 1 - current\_player

if \_\_name\_\_ == "\_\_main\_\_":

play\_game()

QUESTIONS:

Q # 1: Predict the output of the following code:

num=10

def func():

num+=5

return

print("num=",num)

Ans: num= 10

Q # 2: Can functions in Python be called both by value and reference?

Ans: No, functions in Python can only be called by reference. This means that any changes made to the arguments inside the function will affect the original variables as well.

Q # 3: What is a recursive function?

Ans: A recursive function is a function that calls itself to solve a smaller instance of the same problem. For example, the factorial of a number n can be calculated by multiplying n with the factorial of n-1, until n reaches 0.

Q # 4: Which one of the following is incorrect?

A. The variables used inside function are called local variables.

B. The local variables of a particular function can be used inside other functions, but these cannot be used

in global space

C. The variables used outside function are called global variables

D. In order to change the value of global variable inside function, keyword global is used.

Ans: The local variables of a particular function can be used inside other functions, but these cannot be used in global space

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