Lecture 10 Plus Activity

Perform the following instructions and provide a screenshot for each output, and on a Word document, answer the essay questions together with the screenshots. The answer to each question should be at least 3 sentences. Elaborate and describe the output.
Filename: Surname_L10PlusAct

Scope and Global Variables:
Output:

```
x = "Miguel"
print(x)

def func(name):
   global x
   x = name

func("Daniel")
print(x)

result:
Miguel
Daniel
```

What do you observe about the scope of variables in Python?
In Python, global variables can't be directly modified within functions unless the global keyword is used. Calling func() with "Daniel" changes the global variable x from "Miguel" to "Daniel."

Global Keyword:
Output:

```
x = 10
print("Initial value of x:", x)

def func(name):
   global x
   x = name

func(20)
print("Value of x after calling the function:", x)

result:
Initial value of x: 10
Value of x after calling the function: 20
```

How does using the global keyword affect variable scope?
When func() is called, using the global keyword modifies the global variable x. Without it, x would be treated as a local variable within the function, not affecting the global x.

Exception Handling:

Output:

```
Activity 1:
result = 5 / 0
print(result)

ZeroDivisionError: division by zero

Activity 2:
try:
   result = 5 / 0
   print(result)
except ZeroDivisionError:
   print("Error: Cannot divide by zero!")

result:
Error: Cannot divide by zero!
```

Why is exception handling important in programming?

Exception handling allows graceful handling of errors during program execution, preventing unexpected termination.

Lambda Functions and Map Functionality:

Output:

```
x = list(range(1, 11))
add_2 = list(map(lambda num: num + 2, x))
print(add_2)

multiply_by_2 = list(map(lambda num: num * 2, x))
print(multiply_by_2)

result:
[3, 4, 5, 6, 7, 8, 9, 10, 11, 12]
[2, 4, 6, 8, 10, 12, 14, 16, 18, 20]
```

How does the map() function work and when would you use it? What are lambda functions, and when are they useful?

The map() function applies a given function to each item of an iterable and returns a list of results. Lambda functions define simple operations to apply to each element of the list x.

Filter Functionality:

Output:

```
x = list(range(1, 11))
even_numbers = list(filter(lambda num: num % 2 == 0, x))
print(even_numbers)

odd_numbers = list(filter(lambda num: num % 2 != 0, x))
print(odd_numbers)

result:
[2, 4, 6, 8, 10]
[1, 3, 5, 7, 9]
```

What is the purpose of the filter() function, and how does it differ from map()?

The filter() function selectively picks elements from an iterable based on a function returning True or False. Lambda functions act as filters, allowing even or odd numbers to pass through.