PYTHON

Lecture – 14

Recap

- Functions
- Paper Work
    - Write a function that verify a number whether it is prime or not.
    - Write a Python function that takes an integer as input and returns the sum of its digits.

Contents

Modules

- In Python, modules are files that contain Python code (functions, classes, and variables).
- They help in organizing code into manageable sections and allow code reuse across different programs by *importing* them.
- **Types of Modules**:
  - **Built-in modules**: These come with Python and can be used without installation (e.g., math, os, random, etc.).
  - **User-defined modules**: These are Python files created by users with their own custom code.
  - **Third-party modules**: These are external modules that can be installed using tools like pip (e.g., requests, numpy).

Importing built-in Modules

- Modules can be imported into your script using the import keyword.

```
import math
print(math.sqrt(16))  # Output: 4.0
```

- You can import the whole module or specific items from the module.

```
from math import sqrt
print(sqrt(25))  # Output: 5.0
```

- Renaming the module while importing.

```
import math as m
print(m.pi)  # Output: 3.141592653589793
```

Creating user Modeule and Importing

- Create a python file named *mymodule.py*
- Add the following code inside the file.

```
def hello():
    print("Hello python")
```

- Now open another python file named *mainFile.py* and write the following code:

```
import mymodule as m
m.hello() #Output: Hello Python
```

Example

- **Create a Python file** (name it ***utility.py***) that includes the following functions:
  - **max_finder**: This function finds the maximum number between two numbers or from a list.
  - **prime_finder**: This function checks whether a number is prime or not.
  - **digit_finder**: This function finds the sum of the digits of a given number.

- **Create another Python file** (e.g., ***main.py***) that imports the functions from the utility.py module and calls those functions.

Python Math Module

- Python has a set of built-in math functions, including an extensive math module, that allows you to perform mathematical tasks on numbers.
- Built-in Functions: min(), max(), abs(), pow(),

```
x = min(5, 10, 25)
y = max(5, 10, 25)

print(x)
print(y)
```

Math Module

- Python has also a built-in module called math, which extends the list of *mathematical functions*.
- To use it, you must import the math module.
- Functions in math module: sqrt(), factorial(), pow(x,y), ceil(), floor(), log(x, base), sin()

```
import math
x = math.ceil(1.4)
y = math.floor(1.4)

print(x) # returns 2
print(y) # returns 1
```

Modules

- NumPy
- Pandas
- SciPy

Exercises