Activity 1: Run the above code using command prompt. Write below the process of running program from cmd (commands).

Answer: It includes the following steps:

1. Open command prompt and change your directory to the folder where the python file exists
2. cd 3rd Sem)
3. cd DSA-Lab).
4. Then write the command “python nameOfFile.py” and press Enter.
5. This will execute the program.

Activity 2: Describe the process of code compilation and execution in python. How the byte code will be generated? How the process is different from C#. Write in your own words.

Answer: In C# the code is compiled by a compiler into machine code however in python the code is interpretated and executed as byte code . Python relies on direct interpretation and C# uses two stage process.

Activity 3: We do not specify the data type of variable in python. How python will infer the data type. How will you verify the data type of variable in python. Give convincing justification.

Answer: Python is a dynamically typed language and it does not need the specification of the datatype of the variable it infers the datatype of the variable by the value of the variable.

Activity 4: What are mutable and immutable data types in python. Give at least three examples for each.

Answer: Mutable datatypes are those which cannot be modified while the immutable datatypes are those which can be modified. Immutable include string, int etc. Mutable include dictionary, list etc.

Activity 5: What is recursion? Give some prose and cons of recursion.

Answer: Recursion is the process in which a function calls itself again and again until a base case is matched.

Pros

1. Less code is written
2. Mostly used in sorting algorithm

Cons

1. Always requires a base case
2. Occupies a lot of memory

Activity 6: How recursive function is evaluated in memory. Give some details

Answer: In a recursive function, each call creates a new stack frame with the function’s parameters, local variables, and return address. The stack grows with each recursive call and shrinks as each call completes and returns. Proper handling of the base case is crucial to prevent stack overflow.