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

Answer: Open Command Prompt and set the directory where the file exists.

1. D:
2. cd All
3. cd DSA Lab
4. python task1.py

Then this appears

D:\All\DSA Lab>python task1.py

Hello to Data Structure and Algorithms Course

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 Python, Code is not compiled. Python works as an interpreter. It executes line by line

Whereas c++ is a compiler language. Code is compiled first and an execution file is made.

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 uses dynamic variable is determined at runtime based on the value assigned to it. You don't have to declare variable types. This means that the type of a variable can change if you assign a different type of value to it later in the code.

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

Answer: Mutable data types are those which can be modified after their creation whereas immutable are vice versa.

|  |  |
| --- | --- |
| MUTABLE | IMMUTABLE |
| 1. List 2. Sets 3. Dictionaries | 1. String 2. Integers 3. Tuples |

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

Amswer: Function calling itself.

|  |  |
| --- | --- |
| Pros | Cons |
| 1. It requires less code 2. Easy to understand | 1. Always need some base case 2. Requires 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.