

## Data Handling

1. Which of the following is a mutable data type?

- A) String
- B) Tuple
- C) List**
- D) Integer

2. Which of the following is an immutable data type?

- A) List
- B) Dictionary
- C) Set
- D) Tuple**

3. Which data type stores values in key-value pairs?

- A) List
- B) Tuple
- C) Dictionary**
- D) Set

4. Which data type automatically removes duplicate values?

- A) List
- B) Tuple
- C) Dictionary
- D) Set**

5. Which operator is used to calculate the remainder?

- A) %**
- B) //
- C) /
- D) \*\*

6. Which logical operator returns True only if both conditions are True?

- A) or
- B) not
- C) and**
- D) is

7. What is the output?

```
print(2 + 3 * 4)
```

- A) 20
- B) 14**
- C) 24
- D) 10

8. Which error occurs due to incorrect Python syntax?

- A) Runtime Error
- B) Logical Error
- C) Syntax Error**
- D) Name Error

9. Division by zero causes:

- A) Syntax Error
- B) Runtime Error**
- C) Logical Error
- D) Indentation Error

10. A program runs successfully but gives the wrong output. This is called:

- A) Syntax Error
- B) Runtime Error
- C) Logical Error**
- D) Name Error

11. Which method is used to add an element to a set?

- A) append()
- B) insert()
- C) add()**
- D) push()

12. Which function returns the length of a string?

- A) size()
- B) count()
- C) len()**
- D) length()

**13. The first index of a string is:**

- A) 1                                      **B) 0**  
C) -1                                      D) 2

**14. Which method removes an item from a list?**

- A) delete()                              B) erase()  
**C) remove()**                              D) popitem()

## Short Questions

**Q1. What is a data type? Name any four data types in Python.**

**Answer:**

A **data type** specifies the type of value a variable can store.

**Any four data types are:**

- Integer (int)
- Float (float)
- String (str)
- List (list)

**Q2. Differentiate between List and Tuple. (Any Two Points)**

**Answer:**

| List                     | Tuple                         |
|--------------------------|-------------------------------|
| Mutable (can be changed) | Immutable (cannot be changed) |
| Uses square brackets [ ] | Uses parentheses ( )          |

**Q3. What is a Set? Write any two characteristics.**

**Answer:**

A **Set** is an unordered collection of unique elements.

**Characteristics:**

1. Duplicate values are not allowed.
2. Sets are mutable (their elements can be added or removed).

**Q4. What is a Dictionary? Give one example.**

**Answer:**

A **Dictionary** stores data in the form of **key-value pairs**.

**Example:** student = {"Name": "Aman", "Age": 16}

**Q5. Define Mutable and Immutable data types with one example each.**

**Answer:**

**Mutable:** Data that can be modified after creation.

Example: L = [10, 20]

**Immutable:** Data that cannot be modified after creation.

Example: T = (10, 20)

**Q6. What is Type Casting? Name any two type conversion functions.**

**Answer:**

Type casting is the process of converting one data type into another.

Two type conversion functions are:

- int()
- float()

**Q7. What is Debugging?**

**Answer:**

Debugging is the process of identifying and correcting errors in a program so that it runs correctly.

**Q8. Differentiate between String and List.**

**Answer:**

| String            | List                                           |
|-------------------|------------------------------------------------|
| Immutable         | Mutable                                        |
| Stores characters | Stores multiple values of different data types |

**Q8. What is a string? Give one example.**

**Answer:**

A **string** is a sequence of characters enclosed in single or double quotes.

**Example:**

```
name = "Rahul"
```

**Q9. What is the use of the len() function?**

**Answer:**

The len() function returns the number of characters in a string or elements in a list.

**Example:**

```
print(len("Python"))
```

**Q10. What is the use of the append() method?**

**Answer:**

The append() method adds an element to the end of a list.

**Example:**

```
L = [10, 20]
```

```
L.append(30)
```

**Q11. Name any two immutable data types.**

**Answer:**

- String
- Tuple

**Q12. Name any two mutable data types.**

**Answer:**

- List
- Dictionary

## Long Questions

**Q1. Explain the different data types in Python with suitable examples.**

**Answer:** Python supports the following data types:

**1. Integer (int):** Stores whole numbers.

Example: `a = 25`

**2. Float (float):** Stores decimal numbers.

Example: `b = 15.5`

**3. String (str):** Stores characters enclosed in quotes.

Example: `name = "Rahul"`

**4. List (list):** Ordered and mutable collection.

Example: `L = [10, 20, 30]`

**5. Tuple (tuple):** Ordered and immutable collection.

Example: `T = (10, 20, 30)`

**6. Set (set):** Unordered collection of unique elements.

Example: `S = {10, 20, 30}`

**7. Dictionary (dict):** Stores key-value pairs.

Example: `student = {"Name": "Rahul", "Age": 16}`

**Q2. Explain Lists, Tuples, Sets, and Dictionaries with their characteristics and examples.**

**Answer:**

**List**

- Ordered
- Mutable
- Allows duplicate values

**Example:** `L = [10, 20, 30]`

**Tuple**

- Ordered
- Immutable
- Allows duplicate values

**Example:** `T = (10, 20, 30)`

**Set**

- Unordered
- Mutable
- Does not allow duplicates

**Example:** `S = {10, 20, 30}`

**Dictionary**

- Stores key-value pairs
- Mutable
- Keys must be unique

**Example:** `student = {"Name": "Rahul", "Marks": 90}`

**Q3. Explain the different types of errors in Python with examples.**

**Answer:**

**1. Syntax Error:** Occurs due to incorrect Python syntax.

**Example:**

```
if x > 10
    print(x)
```

**2. Runtime Error:** Occurs during program execution.

**Example:**

```
print(10/0)
```

**3. Logical Error:** The program runs successfully but gives incorrect output.

**Example:**

```
area = length + breadth
```

Correct:

```
area = length * breadth
```

**Q4. Difference Between List and Tuple**

| List                                           | Tuple                                                         |
|------------------------------------------------|---------------------------------------------------------------|
| A list is <b>mutable</b> (can be modified).    | A tuple is <b>immutable</b> (cannot be modified).             |
| It is enclosed in <b>square brackets [ ]</b> . | It is enclosed in <b>parentheses ( )</b> .                    |
| Elements can be added, removed, or changed.    | Elements cannot be added, removed, or changed after creation. |
| Lists use more memory.                         | Tuples use less memory.                                       |
| Lists are generally slower than tuples.        | Tuples are generally faster than lists.                       |

## Programs

**1. Program to Check the Data Type of a Variable**

**Question:**

Write a Python program to display the data type of different variables.

**Program:**

```
a = 25
b = 15.5
c = "Python"
d = [10, 20, 30]
print(type(a))
print(type(b))
print(type(c))
print(type(d))
```

**Output:**

```
<class 'int'>
```

```
<class 'float'>
<class 'str'>
<class 'list'>
```

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## 2. Program to Perform String Operations

### Question:

Write a Python program to perform string operations.

### Program:

```
name = "Python"

print("First Character:", name[0])
print("Last Character:", name[-1])
print("Slice:", name[1:5])
print("Length:", len(name))
```

### Output:

```
First Character: P
Last Character: n
Slice: ytho
Length: 6
```

---

## 3. Program to Perform List Operations

### Question:

Write a Python program to perform list operations.

### Program:

```
fruits = ["Apple", "Mango", "Banana"]

fruits.append("Orange")
fruits.remove("Mango")

print(fruits)
```

### Output:

```
['Apple', 'Banana', 'Orange']
```

---

## 4. Program to Demonstrate Tuple

### Question:

Write a Python program to create and display a tuple.

### Program:

```
days = ("Monday", "Tuesday", "Wednesday")
```

```
print(days)
print(days[1])
```

**Output:**

```
('Monday', 'Tuesday', 'Wednesday')
Tuesday
```

---

## 5. Program to Demonstrate Set

**Question:**

Write a Python program to remove duplicate elements using a set.

**Program:**

```
numbers = {10, 20, 30, 20, 10}
```

```
print(numbers)
```

**Output:**

```
{10, 20, 30}
```

---

## 6. Program to Demonstrate Dictionary

**Question:**

Write a Python program to create and display a dictionary.

**Program:**

```
student = {
    "Name": "Rahul",
    "Age": 16,
    "Marks": 95
}
```

```
print(student)
print(student["Marks"])
```

**Output:**

```
{'Name': 'Rahul', 'Age': 16, 'Marks': 95}
95
```

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## 7. Program to Demonstrate Type Casting

**Question:**

Write a Python program to convert a string into an integer.

**Program:**

```
a = "100"
```

```
b = int(a)
```

```
print(b)
```

```
print(type(b))
```

**Output:**

```
100
```

```
<class 'int'>
```

---

## 8. Program to Demonstrate Mutable and Immutable Data Types

**Question:**

Write a Python program to show mutable and immutable data types.

**Program:**

```
# Mutable
```

```
L = [10, 20, 30]
```

```
L[1] = 100
```

```
print("List:", L)
```

```
# Immutable
```

```
T = (10, 20, 30)
```

```
print("Tuple:", T)
```

**Output:**

```
List: [10, 100, 30]
```

```
Tuple: (10, 20, 30)
```

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## 9. Program to Demonstrate Relational and Logical Operators

**Question:**

Write a Python program to demonstrate relational and logical operators.

**Program:**

```
a = 10
```

```
b = 20
```

```
print(a < b)
```

```
print(a == b)
```

```
print(a < b and b > 15)
```

```
print(a > b or b > 15)
```

**Output:**

```
True
```



False

True

True