EXERCISES

A. Multiple choice questions

1. Identify the datatype `L = “45”`

   a. String b. int c. float d. tuple

2. Which of the following function converts a string to an integer in python?

   a. int(x) b. long(x) c. float(x) d.str(x)

3. Which special symbol is used to add comments in python?

   a. $ b.// c. /*.... */ d.#

4. Which of the following variable is valid?

   a. Str name b.1str c._str d.#Str

5. Elements in the list are enclosed in _____ brackets

   a. ( ) b. { } c. [ ] d. /* */

6. Index value of last element in list is _____

   a. 0 b.-10 c. -1 d.10

7. What will be the output of the following code?

```
a = [10,20,30,40,50]
print(a[0])
```

   a.20 b.50 c. 10 d.40

8. Name the function that displays the data type of the variable.

   a. data( ) b. type( ) c. datatype( ) d. int( )

9. Which library helps in manipulating csv files?

   a. files b.csv c. math d. print

10. Which keyword can be used to stop a loop?

    a. stop b.break c. brake d. close

11. What is the primary data structure used in NumPy to represent arrays of any dimension?

    a) Series b) DataFrame c) ndarray d) Panel

12. Which of the following is not a valid method to access elements of a Pandas DataFrame?

    a) Using column names as attributes.
    b) Using row and column labels with the .loc[] accessor.
    c) Using integer-based indexing with the .iloc[] accessor.
    d) Using the .get() method.

13. What is the purpose of the head() method in Pandas?

    a) To display the first few rows of a DataFrame.
    b) To display the last few rows of a DataFrame.
    c) To count the number of rows in a DataFrame.
    d) To perform aggregation operations on a DataFrame.

14. Which method is used to drop rows with missing values from a DataFrame in Pandas?

    a) drop_rows() b) remove_missing() c) dropna() d) drop_missing_values

15. Which is not a module of Sklearn?

a) load_iris b)train_test_split c)metrics d)Scikit

ANSWERS

1. a. String
2. a. int(x)
3. d. #
4. c. _str
5. c. [ ]
6. c. -1
7. c. 10
8. b. type( )
9. b. .csv
10. b. break
11. c. ndarray
12. d. Using the .get( ) method
13. a) To display the first few rows of a DataFrame
14. c. dropna( )
15. d. Scikit

B. Answer the following questions

1. input() function accepts the value as string only. How can you convert string to int?
   Using int( ) function together with input( ), we can convert string to int.

2. What are variables? What are the rules of declaring variables in Python?
   Named labels whose value can be used and processed during program run. Generally, keywords (list given above) are not used as variables. Variable names cannot start with digit and also it can't contain any special characters except underscore.

3. What do you mean by type casting?
   A variable of particular datatype can be converted into another datatype using some functions. The explicit conversion of an operand to a specific type is called type casting.

4. "Python supports dynamic typing", True or False. Justify your answer.
   True.
   A variable pointing to a value of certain data type can be made to point to a value/object of another data type. This is called Dynamic Typing. Python supports Dynamic Typing.

5. Name any four features of python language.
   - ❖ High Level language
   - ❖ Interpreted Language
   - ❖ Free and Open Source
   - ❖ Platform Independent (Cross-Platform)

6. Give examples for keywords.
   and, as, continue, if, not try, del, pass

7. Expand CSV.
   Comma Separated Values

8. How do you read data from a CSV file into a Pandas DataFrame?
   import pandas as pd
   pd.read_csv("filename.csv")

C. Long Answer Questions

1. Describe the data types supported by Python, providing relevant examples.

Integer	Stores whole number	a=10
Floaing Point	Stores numbers with fractional part	x=5.5
Complex	Stores a number having real and imaginary part	num=a+bj
String	immutable sequences Stores text enclosed in single or double quote or triple quotes	name= “Ria”)
List	mutable sequences Stores list of comma separated values of any data type between square [ ]	lst=[25, 15.6, “car”, “XY”]
Tuple	Immutable sequence Stores list of comma separated values of any data type between parentheses ( )	tup=(11, 12.3, “abc”)
Dictionary	Unordered set of comma-separated key:value pairs within braces {}	dict= { 1 : “One”, 2: “Two”, 3: “Three”}

2. Define an operator and provide examples of different operators along with their functions.

Operators are symbols or keywords that perform operations on operands to produce a result. Python supports a wide range of operators:

- Arithmetic operators (+, -, *, /, %)
- Relational operators (==, !=, <, >, <=, >=)
- Assignment operators (=, +=, -=)
- Logical operators (and, or, not)
- Bitwise operators (&, |, ^, <<, >>)
- Identity operators (is, is not)
- Membership operators (in, not in)

D. Practice Programs

1. Write a Tipper program where the user inputs the total restaurant bill. The program should then display two amounts: 15 percent tip and 20 percent tip.

```
bill_total = float(input("Enter the restaurant bill total: "))

# Calculate the 15% tip
tip_15_percent = bill_total * 0.15

# Calculate the 20% tip
tip_20_percent = bill_total * 0.20

# Display the tip amounts
print("15% Tip: Rs", format(tip_15_percent, '.2f'))
print("20% Tip: Rs", format(tip_20_percent, '.2f'))
```

```
Enter the restaurant bill total: 1235
15% Tip: Rs 185.25
20% Tip: Rs 247.00
```

2. Write a program to check whether the user is eligible for driving license or not.

```
age = int(input("Enter your age: "))

# Check if the user is eligible for a driving license
if age >= 18:
    print("Congratulations! You are eligible for a driving license.")
else:
    print("Sorry, you are not eligible for a driving license yet. You need to be at least 18 years
```

```
Enter your age: 18
Congratulations! You are eligible for a driving license.
```

3. Your father always gives his car for service after 15000 km. Check whether his car needs service or not. Read the kilometer reading from the user and give the output.

```
kilometer_reading = float(input("Enter the kilometer reading of the car: "))

# Define the service threshold (in kilometers)
service_threshold = 15000

# Check if the kilometer reading exceeds the service threshold
if kilometer_reading >= service_threshold:
    print('''Your father's car needs service. It has exceeded the service
          threshold of''', service_threshold, "kilometers.")
else:
    print('''Your father's car does not need service yet. It has not exceeded the service
           threshold of", service_threshold, "kilometers.")
```

```
Enter the kilometer reading of the car: 16543
Your father's car needs service. It has exceeded the service threshold of 15000 kilometers.
```

4. Write a program to display the first ten even natural numbers (use for loop).

```
count = 0

# Iterate through natural numbers starting from 1
for num in range(1, 101):  # We iterate up to 100 to ensure we get the first ten even natural numbe
    # Check if the number is even
    if num % 2 == 0:
        # Print the even number
        print(num, end=" ")
        # Increment the count of even numbers
        count += 1
        # Check if we have printed the first ten even numbers
        if count == 10:
            break
```

```
2 4 6 8 10 12 14 16 18 20
```

5. Write a program to accept the Basic salary from the user and calculate the Net Salary.

Net Salary= Basic Salary + HRA + DA -PF

HRA=30% of Basic DA=20% of Basic PF=12% of Basic

```
basic_salary = float(input("Enter the Basic Salary: "))
# Calculate HRA (30% of Basic)
hra = 0.30 * basic_salary
# Calculate DA (20% of Basic)
da = 0.20 * basic_salary
# Calculate PF (12% of Basic)
pf = 0.12 * basic_salary
# Calculate Net Salary
net_salary = basic_salary + hra + da - pf

# Display the Net Salary
print("Basic: ", basic_salary)
print("House Rent Allowance: ", hra)
print("Dearness Allowance: ", da)
print("Provident Fund: ", pf)
print("Net Salary:", net_salary)
```

```
Enter the Basic Salary: 13425
Basic:  13425.0
House Rent Allowance:  4027.5
Dearness Allowance:  2685.0
Provident Fund:  1611.0
Net Salary: 18526.5
```

6. Write a program to create series from an array in Python.

```
import numpy as np
import pandas as pd

# Define a NumPy ndarray
data_array = np.array([10, 20, 30, 40, 50])

# Create a series from the ndarray
series = pd.Series(data_array)

# Display the series
print("Series from ndarray:")
print(series)
```

```
Series from ndarray:
0    10
1    20
2    30
3    40
4    50
dtype: int32
```

7. Consider the following admission.csv and answer the following questions:

Name	CLASS	Gender	Marks
Amit	10	M	75
Ashu	9	F	95
Abhinav	9	M	86
Ravi	10	M	57
Rashmi	11	F	78
Ramesh	10	M	72
Mohit	9	M	53
Manavi	10	F	47
Dhruv	9	M	76

a. Create a dataframe from the admission.csv

```
import pandas as pd
import csv
df=pd.read_csv("admission.csv")
print(df)
```

b. Display first 3 rows of the dataframe

```
print(df.head(3))
```

c. Display the details of Ravi

```
print(df . loc['Ravi'])
```

d. Display the total number of rows and columns in the data frame

```
print(df.shape)
```

e. Display the column "Gender"

```
print(df['Gender'])
```

E.Competency Based Questions

1. Help Priya to differentiate the given information into various datatypes of Python. Name of the student, email id, student id, marks in 5 subjects which can be changed at any point, 3 extra subjects chosen which cannot be changed later.

   Ans: The different datatypes of Python for the given information are:

   a. Name of the student-String type
   b. Email id-String type
   c. Student id-Integer type
   d. Marks in 5 subjects which can be changed at any point-List type
   e. Extra 3 subjects which cannot be changed later-Tuple type.

2. For any analysis to be done, a huge amount of data needs to be collected and stored in a proper format. Rohan has stored the information in a delimited file that stores tabular data which is separated by comma. Which type of file is Rohan using?

   Ans: CSV file (Comma Separated Values)

3. Athrav is confused about the different libraries of Python. Help him choose the correct library for the following tasks.
   a. Data manipulation and aggregation functionalities
   b. Numerical computing
   c. Mathematical operations like square root, cosine values
   d. Machine learning and statistical modeling

   Ans: a. pandas b. numpy c. math d. scikit-learn

4. Rohit wants to input the data about the runs scored by his 50 classmates. Which is the most appropriate loop to be used in this case?
   Ans: 'for' loop

5. Samhita needs guidance to identify these concepts related to Python. As a Python language expert, help her.
   a. ___ is inserted if a corresponding value for a column is missing. (NaN).
   b. ____ is used when we need to work on multiple columns at a time. (Data Frame).
   c. Unordered set of comma-separated key:value pairs within braces {} – dictionary.
   d. _____ are symbols or keywords that perform operations on operands to produce a result. (Operators)
   e. _____ is a dataset which is classic and widely used in ML, particularly for classification tasks. (Iris dataset)
   f. It is a type of supervised learning algorithm used for classification tasks. (KNN – K nearest neighbors).