Practical 1

Name = Chetan Sawant

roll no = 53

1. Write a Python program that creates variables of different data types (integer, float,

string, list, and dictionary) and prints their types using the type() function.

```
In [10]: a = 42
print("A:", type(a))
b= 3.14
print("B:", type(b))
c = "Hello, World!"
print("C:", type(c))
d = [1, 2, 3, 4, 5]
print("D:", type(d))
e = {'a': 1, 'b': 2, 'c': 3}
print("E:", type(e))
```

```
A: <class 'int'>
B: <class 'float'>
C: <class 'str'>
D: <class 'list'>
E: <class 'dict'>
```

2. Write a Python program that takes user input for their name and age using the input()

function, then prints a greeting message including the input data

```
In [1]: name = input("Enter your name: ")
age = input("Enter your age: ")
print(f"Hello, {name}! You are {age} years old.")
```

```
Hello, chetan! You are 20 years old.
```

3. Define a constant PI = 3.14159 and a variable radius. Write a program to calculate

and print the area of a circle using the formula area = PI * radius * radius.

```
In [17]: PI = 3.14159
radius = float(input("Enter the radius of the circle: "))
area = PI * radius * radius
print(f"The area of a circle with radius {radius} is: {area}")
```

```
The area of a circle with radius 4.0 is: 50.26544
```

4 Write a Python program that demonstrates different data types (integer, float, string,

list, tuple, dictionary). Create one example of each type and print them.

```
In [20]: my_integer = 42
print("Integer example:", my_integer)
print("Type:", type(my_integer))

my_float = 3.14
```

```
print("\nFloat example:", my_float)
print("Type:", type(my_float))

my_string = "Hello, World!"
print("\nString example:", my_string)
print("Type:", type(my_string))

my_list = [1, 2, 3, 4, 5]
print("\nList example:", my_list)
print("Type:", type(my_list))

my_tuple = (1, 2, 3, 4, 5)
print("\nTuple example:", my_tuple)
print("Type:", type(my_tuple))

my_dict = {'a': 1, 'b': 2, 'c': 3}
print("\nDictionary example:", my_dict)
print("Type:", type(my_dict))
```

```
Integer example: 42
Type: <class 'int'>

Float example: 3.14
Type: <class 'float'>

String example: Hello, World!
Type: <class 'str'>

List example: [1, 2, 3, 4, 5]
Type: <class 'list'>

Tuple example: (1, 2, 3, 4, 5)
Type: <class 'tuple'>

Dictionary example: {'a': 1, 'b': 2, 'c': 3}
Type: <class 'dict'>
```

5 Write a Python program that asks the user for their favorite number, then prints

whether the number is even or odd. Use the modulo operator (%)

In [25]:
```
fav_number = int(input("Enter your favorite number: "))

if fav_number % 2 == 0:
    print(f"{fav_number} is an even number.")
else:
    print(f"{fav_number} is an odd number.")
```

```
6 is an even number.
```

6 Write a Python program to calculate the factorial of a given number using a loop. Include comments to explain each step of the code

In [29]:
```
def calculate_factorial(num):
    factorial = 1

    for i in range(1, num + 1):
        factorial *= i

    return factorial

number = int(input("Enter a number to calculate its factorial: "))

if number < 0:
    print("Factorial is not defined for negative numbers.")
elif number == 0:
    print("Factorial of 0 is 1.")
else:
    result = calculate_factorial(number)
    print(f"The factorial of {number} is: {result}")
```

```
The factorial of 8 is: 40320
```

7 Write a Python program that defines a function with proper indentation. The function

should take a number as input and print whether it is positive, negative, or zero.

Include an example of incorrect indentation in comments and explain why it's

```python
#incorrect
def check_number(number):
    if number > 0:
        print(f"{number} is positive.")
    elif number < 0:
        print(f"{number} is negative.")
    else:
        print("The number is zero.")

check_number(5)
check_number(-3)
check_number(0)
```

```
5 is positive.
-3 is negative.
The number is zero.
```

8 Write a Python program that performs and prints the results of various operations

(addition, subtraction, multiplication, division, modulus, and exponentiation) on two

numbers provided by the user

```python
def perform_operations(num1, num2):

    addition = num1 + num2
    print(f"Addition: {num1} + {num2} = {addition}")


    subtraction = num1 - num2
    print(f"Subtraction: {num1} - {num2} = {subtraction}")

    multiplication = num1 * num2
    print(f"Multiplication: {num1} * {num2} = {multiplication}")

    if num2 != 0:
        division = num1 / num2
        print(f"Division: {num1} / {num2} = {division}")
    else:
        print("Division by zero is undefined.")

    modulus = num1 % num2
    print(f"Modulus: {num1} % {num2} = {modulus}")

    exponentiation = num1 ** num2
    print(f"Exponentiation: {num1} ** {num2} = {exponentiation}")

num1 = float(input("Enter the first number: "))
num2 = float(input("Enter the second number: "))

perform_operations(num1, num2)
```

```
Addition: 30.0 + 20.0 = 50.0
Subtraction: 30.0 - 20.0 = 10.0
Multiplication: 30.0 * 20.0 = 600.0
Division: 30.0 / 20.0 = 1.5
Modulus: 30.0 % 20.0 = 10.0
Exponentiation: 30.0 ** 20.0 = 3.486784401e+29
```

9 Write a Python program that evaluates the expression (a+b)2 where a and b are input

by the user. Print the result

```python
a = float(input("Enter a: "))
b = float(input("Enter b: "))
c =(a+b)**2
print(f"The result of ({a} + {b})**2 is:{c}")
```

```
The result of (20.0 + 3.0)**2 is:529.0
```

10. Write a program to add one integer and floating type number.

```
In [46]: a = 5
         b = 3.5
         c = a + b
         print(f"The result of {a} + {b} is:", c)
```

```
The result of 5 + 3.5 is: 8.5
```

11. Write a program to read the length and breadth of a rectangle from a user and display

the area of the rectangle

```
In [49]: length = float(input("Enter the length of the rectangle: "))
         breadth = float(input("Enter the breadth of the rectangle: "))
         area = length * breadth
         print (f"Area of rectangle is :{area}")
```

```
Area of rectangle is :16.0
```

12 Write a program to find the difference between the ASCII code of any lower case letter and its corresponding upper case letter

```
In [5]:  lowercase_letter = input("Enter a lowercase letter: ")
         difference = ord(lowercase_letter) - ord(lowercase_letter.upper())
         print(f"The difference between the ASCII codes of '{lowercase_letter}' and '{lowercase_letter.upper()}' is: {d
```

```
The difference between the ASCII codes of 'a' and 'A' is: 32
```

13. Translate the following algorithm into Python code.

Step 1: Initialize variable named Pounds with value 10. Step 2: Multiply Pounds by 0.45 and assign it to a variable Kilogram. Step 3: Display the value of variable Pounds and Variable.

```
In [52]: pounds = 10
         kilogram  = pounds * 0.45
         print("value of variable pound:",pounds)
         print("value in kilogram :" , kilogram)
```

```
value of variable pound: 10
value in kilogram : 4.5
```

14. Identify the error in the following piece of code. Explain how you will fi x it.

num1 = '10'

num2 = 20.65

sum = num1 + num2

```
In [55]: num1 = 10
         num2 = 20.65
         sum = num1 + num2
         print(f"{sum}")
```

```
30.65
```