**1**. Here's an example of creating variables with different data types:

(i) string\_var = "Hello, World!"

(ii) list\_var = [1, 2, 3, 4, 5]

(iii) float\_var = 3.14

(iv) tuple\_var = (1, 2, 3)

**2**. Data types of the given variables:

(i) var1 is a string.

(ii) var2 is also a string.

(iii) var3 is a list.

(iv) var4 is an integer.

**3**. Operators and their use:

(i) / (Division Operator): It is used for division and returns the quotient as a float.

Example:

x = 10 / 3

print(x)

# Output: 3.333333333333333

(ii) % (Modulo Operator): It calculates the remainder of the division between two numbers.

Example:

x = 10 % 3

print(x)

# Output: 1

(iii) // (Floor Division Operator): It performs division and returns the integer quotient, discarding any fractional part.

Example:

x = 10 // 3

print(x)

# Output: 3

(iv) \*\* (Exponentiation Operator): It raises a number to the power of another number.

Example:

x = 2 \*\* 3

print(x)

# Output: 8

**4**. Here's an example of creating a list with multiple data types and printing them along with their data types using a for loop:

my\_list = [1, "Hello", 3.14, True, [1, 2, 3], (4, 5, 6), {'key': 'value'}, None, 10+5j, b'bytes']

for item in my\_list:

print(item, type(item))

# Output:

1 <class 'int'>

Hello <class 'str'>

3.14 <class 'float'>

True <class 'bool'>

[1, 2, 3] <class 'list'>

(4, 5, 6) <class 'tuple'>

{'key': 'value'} <class 'dict'>

None <class 'NoneType'>

(10+5j) <class 'complex'>

b'bytes' <class 'bytes'>

**5**. Here's an example of using a while loop to check if number A is divisible by number B and counting the number of times it can be divided

A = 20

B = 5

count = 0

while A % B == 0:

A /= B

count += 1

print("Number of times A is divisible by B:", count)

# Output:

Number of times A is divisible by B: 2

**6**. Here's an example of creating a list of 25 integers and using a for loop with if-else condition to check if each element is divisible by 3:

my\_list = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25]

for num in my\_list:

if num % 3 == 0:

print(num, "is divisible by 3")

else:

print(num, "is not divisible by 3")

# Output:

1 is not divisible by 3

2 is not divisible by 3

3 is divisible by 3

4 is not divisible by 3

5 is not divisible by 3

6 is divisible by 3

7 is not divisible by 3

8 is not divisible by 3

9 is divisible by 3

10 is not divisible by 3

11 is not divisible by 3

12 is divisible by 3

13 is not divisible by 3

14 is not divisible by 3

15 is divisible by 3

16 is not divisible by 3

17 is not divisible by 3

18 is divisible by 3

19 is not divisible by 3

20 is not divisible by 3

21 is divisible by 3

22 is not divisible by 3

23 is not divisible by 3

24 is divisible by 3

25 is not divisible by 3

**7**.

Mutable data types:

Mutable objects can be modified after creation. Changes made to these objects do not create a new object in memory. Examples include lists, dictionaries, and sets. Here's an example with a list:

my\_list = [1, 2, 3]

my\_list.append(4) # Modifying the list by adding an element

print(my\_list)

# Output: [1, 2, 3, 4]

Immutable data types:

Immutable objects cannot be modified once created. Any changes made to these objects create a new object in memory. Examples include strings, tuples, and numbers. Here's an example with a string:

my\_string = "Hello"

my\_string += " World" # Modifying the string by concatenation

print(my\_string)

# Output: "Hello World"