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LAB: 01

Task 1:

Make 2-2 programs of each datatype.

- **NUMERIC TYPES:**

❖ **Integer:**

```
num1 = 4
num2 = 8
sum = num1 + num2
print("The sum is:", sum)
```

```
The sum is: 12
```

```
num = 2

if num % 2 == 0:
    print("The number is even")
else:
    print("The number is odd")
```

```
The number is even
```

❖ Float:

```
num1 = 3.5
num2 = 8.5
result = num1 - num2

print("The result is:", result)
```

```
The result is: -5.0
```

```
num1 = 1.0
num2 = 5.0

result = num1 / num2

print("The answer is:", result)
```

```
The answer is: 0.2
```

❖ Complex:

```
num1 = 4 + 4j
num2 = 5 + 4j
result = num1 + num2
print("The sum is:", result)
```

```
The sum is: (9+8j)
```

```
num1 = 6 + 3j
num2 = 2 + 2j

result = num1 * num2

print("The product is:", result)
```

```
The product is: (6+18j)
```

● SEQUENCE TYPES:

❖ String

```
first_name = "Aqsa"
last_name = "Ilyas"
full_name = first_name + " " + last_name
print("Full name is:", full_name)
```

```
Full name is: Aqsa Ilyas
```

```
message = "Hello, world!"
print(message)
```

```
Hello, world!
```

❖ List:

```
fruits = ["orange", "banana", "watermelon"]
for fruit in fruits:
    print(fruit)
```

```
orange
banana
watermelon
```

```
numbers = [1, 2, 3]
numbers.append(5)
print("Updated list:", numbers)
```

```
Updated list: [1, 2, 3, 5]
```

❖ Tuple:

```
colors = ("pink", "brown", "blue")
print("Second color is:", colors[1])
```

```
Second color is: brown
```

```
fruits = ("grapes", "banana", "cherry")

for fruit in fruits:
    print(fruit)
```

```
grapes
banana
cherry
```

❖ Range:

```
for num in range(1, 6):
    print(num)
```

```
1
2
3
4
5
```

```
for num in range(2, 11, 2):
    print(num)
```

```
2
4
6
8
10
```

● SET TYPES:

❖ Set:

```
fruits = {"apple", "banana", "mango"}

print("Fruits set:", fruits)
```

```
Fruits set: {'apple', 'banana', 'mango'}
```

```
numbers = {1, 2, 3}
numbers.add(4)

print("Updated set:", numbers)
```

```
Updated set: {1, 2, 3, 4}
```

❖ Frozen set:

```
5]: num = frozenset([1,2,3,4])

    print("num frozenset:", num)
```

```
num frozenset: frozenset({1, 2, 3, 4})
```

```
6]: set1 = frozenset([1, 2, 3])
    set2 = frozenset([3, 4, 5])
    common = set1.intersection(set2)

    print("Common items:", common)
```

```
Common items: frozenset({3})
```

● MAPPING TYPE:

❖ Dictionary dict:

```
student = {
    "name": "aqsa",
    "age": 18,
    "class": "BS IT"
}

print("Student Info:", student)
```

```
Student Info: {'name': 'aqsa', 'age': 18, 'class': 'BS IT'}
```

```
person = {
    "name": "aqsa",
    "city": "Karachi"
}

print("Name is:", person["name"])
```

```
Name is: aqsa
```

- **BOLEAN TYPE:**

```
a = 30
b = 10

result = a > b
print("Is a greater than b?", result)
```

```
Is a greater than b? True
```

```
x = 10
y = 10

print("Are x and y equal?", x == y)
```

```
Are x and y equal? True
```

Task 2:

Make up to 5 shapes programs using *

```
print("Square Shape:")
print("* * * * *")
print("* * * * *")
print("* * * * *")
print("* * * * *")
print("* * * * *")
print("Right-Angled Triangle:")
print("*")
print("* *")
print("* * *")
print("* * * *")
print("* * * * *")
print("Inverted Triangle:")
print("* * * * *")
print("* * * *")
print("* * *")
print("* *")
print("*")
```

```
Square Shape:
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
Right-Angled Triangle:
*
* *
* * *
* * * *
* * * * *
Inverted Triangle:
* * * * *
* * * *
* * *
* *
*
```

```
print("Pyramid Shape:")
print("    *")
print("   * *")
print("  * * *")
print(" * * * *")
print("* * * * *")
print("Diamond Shape:")
print("    *")
print("   * *")
print("  * * *")
print("   * *")
print("    *")
```

```
Pyramid Shape:
    *
   * *
  * * *
 * * * *
* * * * *
Diamond Shape:
    *
   * *
  * * *
   * *
    *
```

```
]:
```

Task 3:

Make same shapes you have made in task 2, using * multiple by number.

Program:

```
]: print("Square Shape:")
   print("* " * 5)
   print("* " * 5)
   print("* " * 5)
   print("* " * 5)
   print("* " * 5)
   print("Right-Angled Triangle:")
   print("* " * 1)
   print("* " * 2)
   print("* " * 3)
   print("* " * 4)
   print("* " * 5)
   print("Inverted Triangle:")
   print("* " * 5)
   print("* " * 4)
   print("* " * 3)
   print("* " * 2)
   print("* " * 1)
   print("Pyramid Shape:")
   print(" " * 4 + "* ")
   print(" " * 3 + "* " * 2)
   print(" " * 2 + "* " * 3)
   print(" " * 1 + "* " * 4)
   print(" " * 0 + "* " * 5)
```

```
print("Diamond Shape:")
print(" " * 4 + "* ")
print(" " * 3 + "* " * 2)
print(" " * 2 + "* " * 3)
print(" " * 3 + "* " * 2)
print(" " * 4 + "* ")
```

```
Square Shape:
* * * * *
* * * * *
* * * * *
* * * * *
* * * * *
Right-Angled Triangle:
*
* *
* * *
* * * *
* * * * *
Inverted Triangle:
* * * * *
* * * *
* * *
* *
*
Pyramid Shape:
    *
   * *
  * * *
 * * * *
* * * * *
Diamond Shape:
    *
   * *
  * * *
   * *
    *
```