

1. Dynamic Typing

```
x = 10
print(x, type(x))

x = "Hello Python"
print(x, type(x))
```

```
10 <class 'int'>
Hello Python <class 'str'>
```

2. Mutable vs Immutable Data Types

```
my_list = [1, 2, 3]
my_list[0] = 10
print(my_list)

my_tuple = (1, 2, 3)
# my_tuple[0] = 10
print(my_tuple)
```

```
[10, 2, 3]
(1, 2, 3)
```

3. Local and Global Variables

```
x = 100

def demo():
    y = 50
    print(x, y)

demo()
```

```
100 50
```

4. Return Statement in a Function

```
def add(a, b):
    return a + b

result = add(5, 3)
print(result)
```

```
8
```

5. List Comprehension

```
squares = [x * x for x in range(1, 11)]  
print(squares)
```

```
[1, 4, 9, 16, 25, 36, 49, 64, 81, 100]
```

6. break, continue, and pass

```
for i in range(1, 11):  
    if i == 3:  
        continue  
    if i == 5:  
        break  
    if i == 7:  
        pass  
    print(i)
```

```
1  
2  
4
```

7. Recursion

```
def factorial(n):  
    if n == 0:  
        return 1  
    return n * factorial(n - 1)  
  
print(factorial(5))
```

```
120
```

8. Lambda Function

```
square = lambda x: x * x  
print(square(4))
```

```
16
```

9. is vs ==

```
a = [1, 2, 3]  
b = [1, 2, 3]  
  
print(a == b)  
print(a is b)
```

True
False

10. Docstrings

```
def greet():  
    """This function prints a greeting message"""  
    print("Hello Python")  
  
greet()  
print(greet.__doc__)
```

```
Hello Python  
This function prints a greeting message
```