1. What is Python? Why is it popular in AI & Data Science?

Python is a high-level, interpreted programming language that is easy to read and write. It is popular in AI & Data Science because it has simple syntax, large community support, and powerful libraries like NumPy, Pandas, TensorFlow, and PyTorch.

2. Difference between list, tuple, set and dictionary.

Type	Ordered	Mutable	Duplicates	Examples
List	Yes	Yes	Allowed	[1, 2, 3]
Tuple	Yes	No	Allowed	(1, 2, 3)
Set	No	Yes	Not allowed	{1, 2, 3}
Dictionary	Yes	Yes	Keys not allowed	{"a":1, "b":2}

3. What are variables and data types in Python?

A variable is a name used to store data in memory.Data types define the type of data stored in a variable.

Examples:

```
x = 10          # int
y = 3.14        # float
name = "AI"     # string
is_valid = True  # boolean
```

4. What is the difference between == and =?

= is an assignment operator used to assign a value to a variable.

== is a comparison operator used to compare two values.

Examples:

```
x = 5
x == 5    # True
```

5. Explain *if, elif,* **and** *else.*

if, elif, and *else* are used in Python to **make decisions.**

if checks a condition. If it is **true,** the code inside if runs.
elif is used to check another condition if the if condition is **false.**
else runs when **all conditions are false**.

These statements help the program choose what action to perform.

Example:

```python
age = 18
if age > 18:
    print("Adult")
elif age == 18:
    print("Just Adult")
else:
    print("Minor")
```

6. What is a function? Why do we use functions?

A function is a block of code that performs a specific task.
We use functions to reuse code, reduce repetition, and improve readability.

Example:

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

7. Difference between for loop and while loop

for loop	While loop
Used when number of iterations is known	Used when condition is unknown
Iterates over sequence	Runs while condition is true

Example:

```python
for i in range(5):
    print(i)
```

```python
while i < 5:
    print(i)
    i += 1
```

8. What is a module? Example

A module is a file that contains Python code such as functions and variables.
We use modules to organize code.

Example:

```python
import math
print(math.sqrt(16))
```

9. What is exception handling?

Exception handling is used to handle errors and prevent program crashes.

Example:

```python
try:
    x = int("abc")
except ValueError:
    print("Error occurred")
```

10. What is pip?

pip is the package manager in Python used to install external libraries.

Example:

```
pip install numpy
```