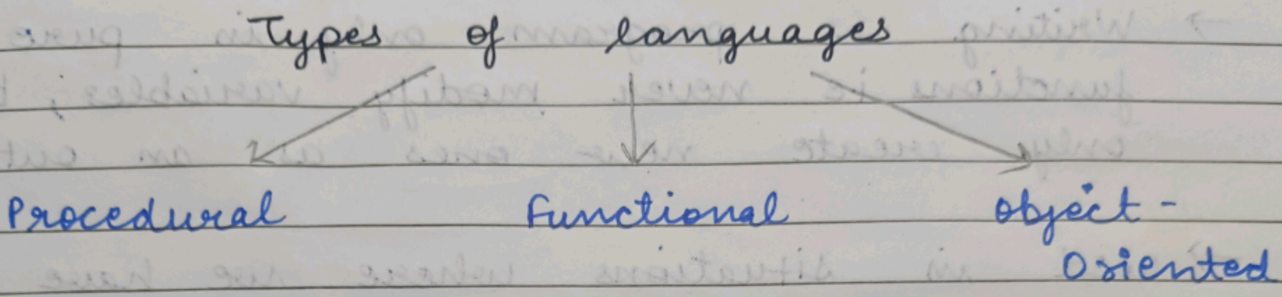
# Introduction to Programming



Types of languages

Procedural

Functional

object - Oriented

## Procedural

→ specifies a series of well - structured steps and procedures to compose a program.

→ contains a systematic order of statements, functions & commands to complete a task.

eg → C, Pascal, fortan, etc

- Focuses on functions to perform tasks.
- follows a top - down approach.

Top - down Approach is a problem - solving or design method where you start with a general overview or high level concept & then break down into smalle elements as needed.

- Uses global & local variables for data management.

## functional

- → Writing a program only in pure functions i.e never modify variables, but only create new ones as an output.

- → used in situations where we have to perform lots of different operations on same data set, like ML.

- → First class function :- Block of code that we can reuse again & again.
  eg → Python

## Object-Oriented

- → Revolves around objects
- → Code + Data = Object
- → Developed to make it easier to develop, debug, reuse & maintain software.
  eg → JAVA, python, C++.

## Static V/s Dynamic languages

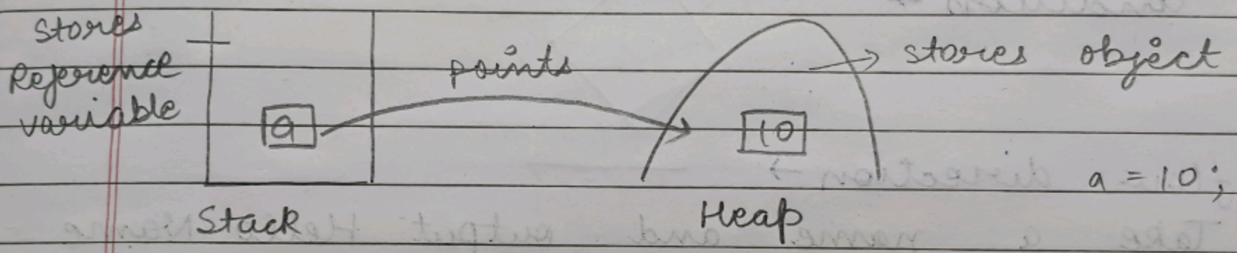
### Static

- → Perform type checkinig at compile time.
- → Errors will show at compile time.
- → Declare datatype before use.
- → More control.

## Dynamic

→ Perform type checking at runtime.
→ Error might not show till program is run.
→ No need to declare variable's datatype.
→ Save times in writing code but might give error at runtime.

memory management → two types of memory → Stack memory
→ Heap memory



- More than one reference variable can point to the same object.

- If any reference variable is changing the object's value, it will be changed for all

What happens when there is no referen variable to the object?

Garbage collection → objects that do not have a reference variable pointing towards them.