Introduction to programing

Types of languages

Procedural   Functional   Object oriented
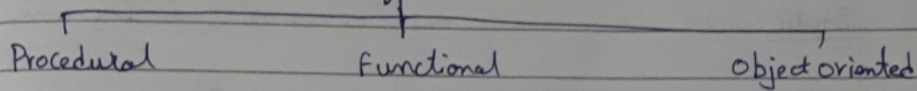
Procedural :-

— Specifies a series of well-structured steps and procedures to compass a program

— Contains a systematic order of statemats, furctions and commands to complete a task

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 the same set of data, like ML

Object oriented

— Revolves around objects
— Code+ data = object
— developed to make it easier to develop, debug, reuse & maintain software

Static Vs dynamic languages

Static	Dynamic
→ Perform type checking at compile time	→ Perform type checking at runtime
→ Errors will show at compile time	→ Error might not show till program is run
→ Declare datatype before you use it	→ No need to declare data types of Variables
→ More control	→ Saves time in writing code but might give error at runtime

Eg:- int a=10 } Throws an error at compile time
a = "Preethan"

Eg:- a = 10 } doesn't throw an error
a = "Preethon"

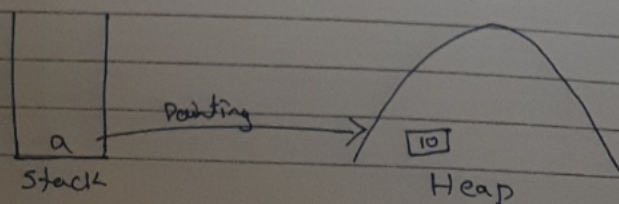Since, static languages does type checking at compile time

Since, dynamic languages doesn't care about types of Variable atn compile time

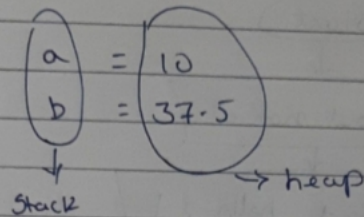## Memory management :-

a = 10
↗ ↘ object
Reference
Variable

Types of memory :-

1) stack memory
2) Heap memory

```
|   |
|   |
| a | ──Pointing──→  [10]
Stack              Heap
```

→ Variables (or) function calls are stored in stack memory & the object is stored in the heap memory & Variable will be pointing towards the object as shown in the picture above
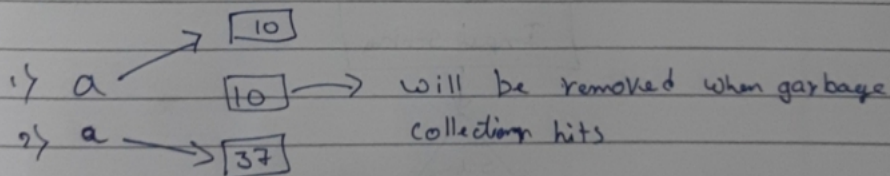

→ Object with no reference Variable will be removed from the heap memory when garbage collection hits
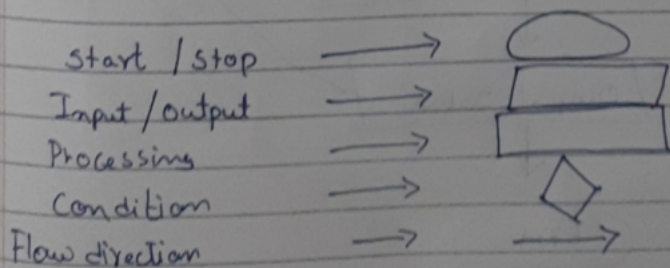
Eg :-
   i) int a = 10
   2) a = 37

1) a → 10
   10 → will be removed when garbage
2) a → 37   collection hits

②   <u>Flow of program</u>

<u>Flow charts :-</u>

Start / stop   →
Input / output   →
Processing   →
Condition   →
Flow direction   →   →

→ Flow charts are used to visualize our thought process of any algorithm

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