Types of Languages

• **Procedural**

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

→ Contains a systematic order of statements, functions and commands to complete a task.

• **Function**

→ Writing a program only in pure function 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 = Objects.

→ Developed to make it easier to develop, debug, rescued and maintain software.

⇒ **Static Language :-**

→ In static languages, the ~~[illegible]~~ datatype can to be changed once a variable is created. This means that if we define an integer, we can only updates ~~[illegible]~~

its value and no other data, can be assigned to it.

→ perform type cheacking at compile time.

→ Errors will show at compile time.

→ Declare datatype before you use it.

→ More controle.

```
e.g- int a = 10; (correct)
     int a = "vishal" (x) //error.
     String a = 20 //error
```

Dynamic languages :-

→ In dynamic languages, the types and values are both dynamic, which means the types and value can both be changed. A variable that was preveiously assigned an integer can be assigned a string. the type checking is done during run time.

→ perform type checking at runtime.

→ Error might not show till program is run.

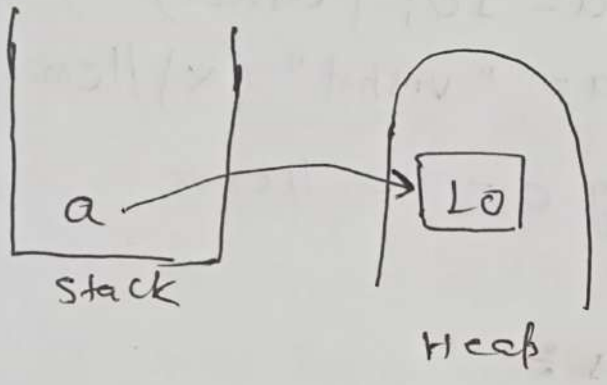
→ No need to declare datatype of variables.

→ Saves time in writing code but might give error at runtime.

Memory Managements

→ The JVM divides the memory into two parts (stack & Heap).

→ When we declare a variable then the reference variable stored in stack memory points to the object of that variable in heap memory.



int a = 10;

Here, a called reference variable and 10 is the object of the reference variable.

→ Reference variable are stored in stack memory.

→ Heap memory stores the objects of reference variable.

vishal
vishlu
p.d
singh

- More than one reference variable can points to same object.
- If any changes made to the object of any reference variable that will be reflected to all others variable pointing to same objects.
- If there is an object without reference variable then object will be destroyed by " Grabage collection".

e.g- a = [11, 22, 33, 44]

b = a

a[0] = 99

S.o.p (b);

$\hookrightarrow$ 99,22, 33, 44

$$\begin{tikzcd} a \arrow[r] & {[\overset{99}{\cancel{11}},22,33,44]} \\ b \arrow[ur] & \end{tikzcd}$$