

Introduction to Programming

Programming is a way to instruct the computer to perform various task. Computers only understand Binary i.e., 0's and 1's

{ Types of Programming Languages }

Procedural	Functional	Object - oriented
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(1.) Procedural:

- specifies a series of well structured steps and procedures to compose a program
- contains a systematic order of statements and commands to complete a task.

(2.) Functional:

- writing a program only in pure functions i.e., never modify variables but only create new ones as an output
- used in a situation where we have to perform lots of different operations on a same set of data like ML

(3.) Object - Oriented:

- revolves around objects
- code + data = object.

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StaticDynamic

- | | |
|---|--|
| 1.) performs type checking at compile time | 1.) performs type checking at runtime |
| 2.) errors will be shown at compile time | 2.) error might show till programs run |
| 3.) datatypes have to be declared before use
<div style="border: 1px solid black; padding: 2px; display: inline-block;">int a = 10</div> | 3.) no need to declare datatypes [language figures it out] <div style="border: 1px solid black; padding: 2px; display: inline-block;">a = 10</div> |
| 4.) more control | 4.) saves time |

* Memory management:Stack

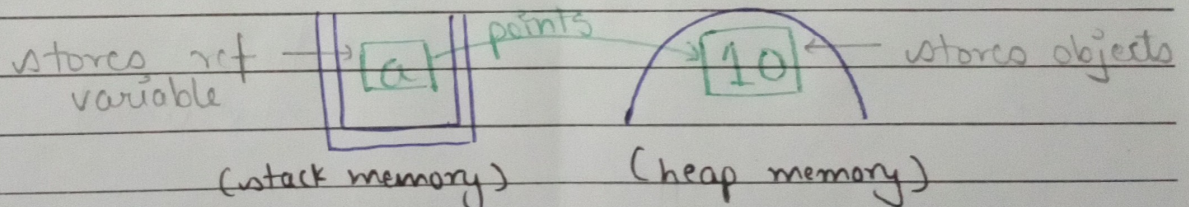
a declared variable is stored in stack memory

reference variable are stored in stack memory

Heap

variable stored in stack memory points to the object which is stored in heap memory

heap memory stores the objects of reference variable

Note points →

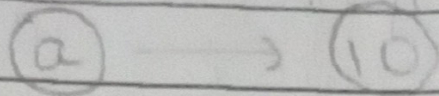
- more than one reference variable can point towards one object
- if any one of the ref. variable changes the object, then it is changed for all reference variable that points towards the same object

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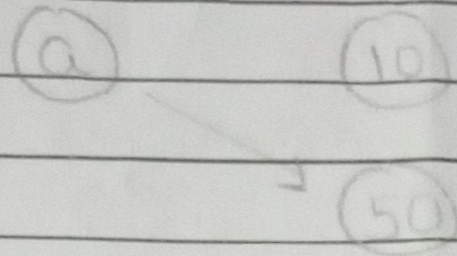
Now initially,

$a = 10$



then,

$a = 50$



object with no. } will be removed
reference var. } by garbage
collector