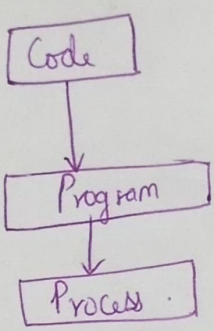
Combine to solve the big problem. 57programs

Java Concurrency & Multithreading

Intro to Multithreading

Process → Running prog



Parallelism → (when multiple task progress together).

Concurrency → (Multiple things but only 1 progress at a time).

Hello world of threads

objective :- Write a program that prints "Hello world" in a separate thread.

```
Class HelloworldPrinter implements Runnable
{
    void run(){
      print ("Hello world");
    }
}
```

Main method.

→ Create an object

→ Pass object on thread

→ Start the thread

Step 1:- Think in terms of task that you want to do in parallel.

Step 2:- For each thing Create a class and implement runnable.

(If we are ~~using~~ implementing runnable we should use run()).

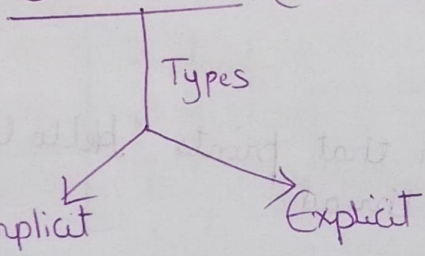
Cont.

Array-

length → Var.length

Sort → Arrays.sort(Var).

CASTING (Convert one type to another)



* Java allows implicit Casting (Big → Small).

* Convert one datatype to another data Type is Casting

datatype Var = Var + (int) number (double).

* Cannot Convert String into int.

Multithreading

- Multiple threads of execut^n inside same appl^n.

A thread is like a separate CPU execut^n your appl^n. It is like having multiple CPU execut^n diff parts of code at same time.

Why Multithreading.

- Better utilizat^n of single CPU.
- Better " " multiple CPU or CPU Cores.

Benefits

Simpler program design in some situat^n
More fair division of CPU resources bet^n diff task.

Diff^n Ways to Create Threads.

(i). Extending Thread Class
(ii). Implementing runnable interface.

Lifecycle

A thread can exist in any one of the following states.

(i) New (ii). Runnable (iii). Blocked (iv) Waiting
(v). Timed Waiting (vi). Terminated.

1. New State - Not yet started to run. when a thread lies in this state, code is yet to be run and has not started to execute.

2. Runnable State - Ready to run thread or already running.

3. Blocked - It will be in block state when it is trying for a lock.

4. Waiting State - when it will call wait() or Join().

Software

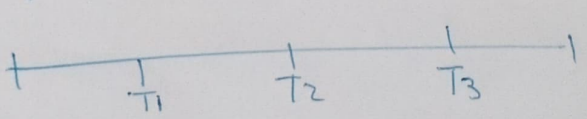
Process - A process may also want to get multiple things done in parallel.

→ input from Keyboard
→ Spell Check
→ Grammar Check
→ Refreshing UI.

Concurrency & Parallelism

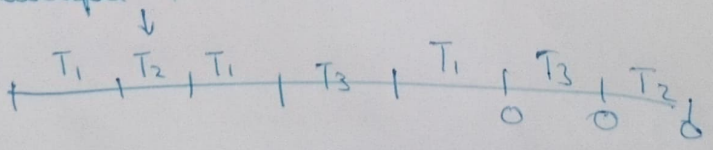
option 1:- Sequential

* Only 1 task in middle at a time



option 2:-(Concurrent).

* Multiple task in mid at same time



option 3:- (Parallelism) + (Concurrent).