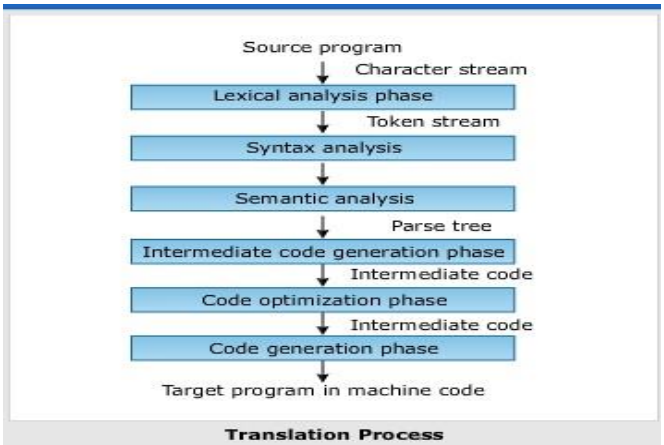
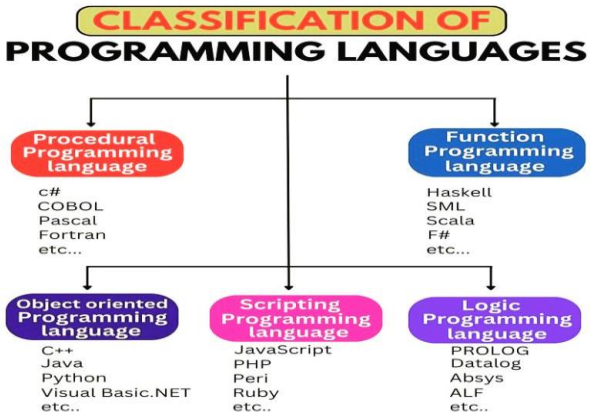
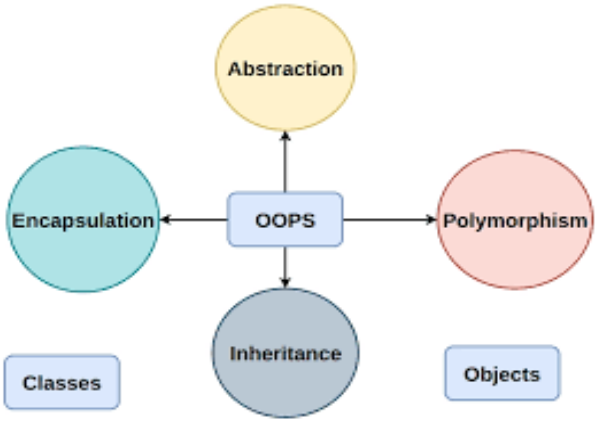
Principle of Programming Languages Cheat Sheet

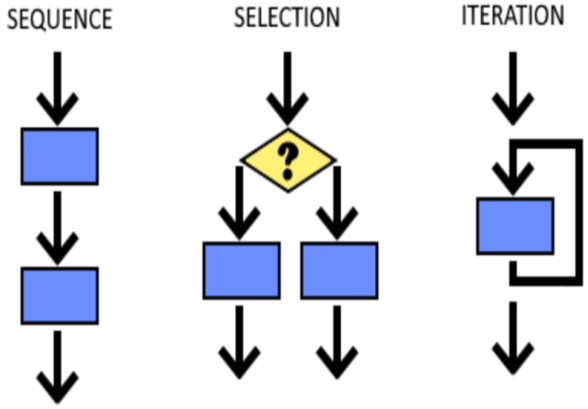


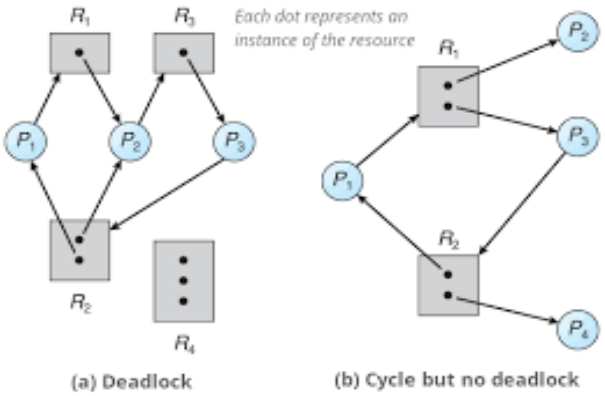
Translation Process



Procedural Programming Approach	Object-Oriented Programming Approach
A programming approach that divides the code into modules or functions.	A programming approach based on the objects, which contain data in the form of fields/data members and code in the form of methods/functions
Mainly focused on dividing the program into a set of functions/methods in which each function/method works as a sub-program.	Mainly focused on representing a program using a set of objects which encapsulates data members and member functions.
The main method communicates with functions by calling those functions into the main program.	Objects communicates with each-other by passing the data.







How does recursion work?

```
void recurse()
{
    ... .. ...
    recurse();
    ... .. ...
}

int main()
{
    ... .. ...
    recurse();
    ... .. ...
}
```

recursive call

Table 3: Some Valid Formulas of Propositional Calculus

law	formula
Law of identity	$p \equiv p$
Law of double negation	$p \equiv \sim\sim p$
Law of excluded middle	$p \vee \sim p$
Law of noncontradiction	$\sim(p \cdot \sim p)$
De Morgan laws	$(p \cdot q) \equiv \sim(\sim p \vee \sim q)$
	$(p \vee q) \equiv \sim(\sim p \cdot \sim q)$
Commutative laws	$(p \vee q) \equiv (q \vee p)$
	$(p \cdot q) \equiv (q \cdot p)$
Associative laws	$[(p \vee q) \vee r] \equiv [p \vee (q \vee r)]$
	$[(p \cdot q) \cdot r] \equiv [p \cdot (q \cdot r)]$
Law of transposition	$(p \supset q) \equiv (\sim q \supset \sim p)$
Distributive laws	$[p \cdot (q \vee r)] \equiv [(p \cdot q) \vee (p \cdot r)]$
	$[p \vee (q \cdot r)] \equiv [(p \vee q) \cdot (p \vee r)]$
Law of permutation	$[p \supset (q \supset r)] \equiv [q \supset (p \supset r)]$
Law of syllogism	$(p \supset q) \supset [(q \supset r) \supset (p \supset r)]$
Law of importation	$[p \supset (q \supset r)] \supset [(p \cdot q) \supset r]$
Law of exportation	$[(p \cdot q) \supset r] \supset [p \supset (q \supset r)]$