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Programming Paradigm in Java

=> Programming Paradigm :-

- -> Programming paradigm is a way or an approach to solve any problem or to achieve any task using any programming languages
- -> Programming paradigm are a way to classify programming languages based on their features
- -> There are 2 classifications of programming paradigm :-
 - 1. Imperative Programming Paradigm
 - 2. Declarative Programming Paradigm

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=> What is difference between Imperative & Declarative Programming Paradigm ?

1. PROGRAMMING STYLE:-

Imperative :- We have to specify step by step every task

Declarative :- We have to define the problem to achieve the task

2. TASK:-

Imperative :- User makes the decision and command to the compiler

Declarative :- Allows compiler to make decisions

3. REAL WORLD EXAMPLE:-

-> Task (read mails; buy PC; proposal;)

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Imperative:-

Declarative:-

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4. SMART:-

Imperative :- User is more smart as compared to system

Declarative :- System is more smart as compared to user

5. PROGRAMMING FOCUS:-

Imperative :- "What"

Declarative :- "How"

6. PRIMARY FLOW CONTROL:-

Imperative :- Loops, Conditional; functions/methods etc

Declarative :- Functions calls (including recursion)

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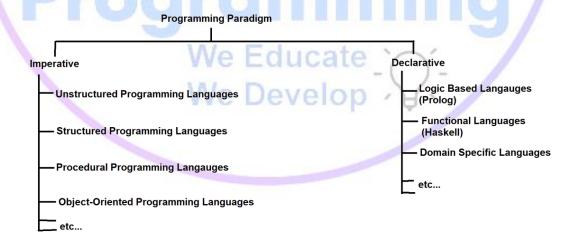
7. EXAMPLE:-

Imperative :- FORTRAN, Assembly Languages, COBOL, C, C++, Java, Python etc

Declarative :- SQL, Haskell, Prolog etc

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=> Diagram for Programming Paradigm :-



=> Unstructured Programming Paradigm :-

- 1. These are the first programming language categories that was introduced at starting point of computers
 - 2. For examples FORTRAN, COBOL, BASIC etc
- 3. In these languages there was not fixed structure or way to achieve the task or to solve the problem
 - 4. In this type we use mnemonic codes
- 5. In this part flow control was achieved by "goto" statement
- 6. Hard to learn and difficult to achieve any task because number of lines of code were increased

=> Structured Programming Paradigm :-

- 1. These were introduced after unstructured programming paradigm and used till now
 - 2. For examples PASCAL, C etc
- 3. These have fixed structure to achieve any task
- 4. These dont use any mnemonic codes which makes this language easier (high level language syntax is used)
- 5. In this part a lot of flow control statements were introduced for example if, else, for, while etc
- 6. Easier to learn and easy to achieve any task as there were improved code

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-> Structured programming paradigm have a lot of issues like less modularity, abstraction was not good, less security, less sharability, less code reusability and because of these reasons OOP's was introduced

=> Procedure Programming Paradigm :-

- 1. In POP task can be divided into small parts known as functions/methods
 - 2. In POP top to down approach is used
 - 3. No Access Specifiers
 - 4. It deals with algorithms
 - 5. It uses less memory
 - 6. For example FORTRAN, PASCAL, C etc
- -> In POP there were a lot of issues less security and due to this reason OOP's were mostly adopted language by developers

=> Object Oriented Programming Paradigm :-

- 1. In OOP program is divided into parts i.e. Objects
 - 2. In OOP bottom up approch is used
- 3. Have a lot of access modifiers or access specifiers
 - 4. OOP deals with data
 - 5. It needs more memory as compared to POP
 - 6. For examples Java, C++, C#, Python etc

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NOTE: One language can use multiple programming paradigm

=> What is difference between Object Oriented Programming Languages and Object Based Programming Languages ?

- -> In object oriented programming languages inheritance feature is mostly used but in case of object based programming languages inheritance concept is not used.
- -> Object oriented programming languages are Java

Object based programming languages are JavaScript

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