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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;)

Imperative :-

Declarative :-

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)

7. EXAMPLE :-

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

Declarative :- SQL, Haskell, Prolog etc

=> 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

-> 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 approach 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

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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