

Programming Approaches – There are mainly 3 types of approaches which have been developed till now -

1. Structured Programming -

- The basic principle of the structured programming approach is to divide a program into functions and modules.
- The use of modules and functions makes the program more understandable and readable.
- It helps to write cleaner code and to maintain control over the functions and modules.
- This approach gives importance to functions rather than data.
- It focuses on the development of large software applications, like, C was used for modern operating system development.
- The programming languages: The programming languages: **PASCAL** (introduced by Niklaus Wirth) and **C** (introduced by Dennis Ritchie) follow this approach.

2. Procedural Programming Approach –

- This approach is also known as the **top-down** approach.
- In this approach, a program is divided into functions that perform specific tasks. This approach is mainly used for medium-sized applications.
- Data is global, and all the functions can access global data.
- The basic drawback of the procedural programming approach is that data is not secured because data is global and can be accessed by any function.
- Program control flow is achieved through function calls and goto statements.
- The programming languages: **FORTRAN** (developed by IBM) and **COBOL** (developed by Dr Grace Murray Hopper) follow this approach.

3. The Object-Oriented Programming (OOP) Approach –

- It is nothing but that which allows the writing of programs with the help of certain classes and real-time objects.
- We can say that this approach is very close to the real-world and its applications because the state and behaviour of these classes and objects are almost the same as real-world objects.
- OOP treats data as a critical element.
- Emphasis is on data rather than procedure.
- Decomposition of the problem into simpler modules.
- Doesn't allow data to freely flow in the entire system, ie localized control flow.
- Data is protected from external functions.

Advantages of OOPs –

- It models the real world very well.
- With OOP, programs are easy to understand and maintain.
- It offers code reusability. Already created classes can be reused without having to write them again.
- It facilitates the quick development of programs where parallel development of classes is possible.
- With OOP, programs are easier to test, manage and debug.

Disadvantages of OOP –

- With OOP, classes sometimes tend to be over-generalised.
- The relations among classes become superficial at times.
- The OOP design is tricky and requires appropriate knowledge. Also, one needs to do proper planning and design for OOP programming.
- To program with OOP, the programmer needs proper skills such as that of design, programming and thinking in terms of objects and classes etc.