Principles of Programming Languages [210255]
SE Computer Engineering

UNIT-I
Fundamentals of Programming

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Unit I Contents (06 Hours)

- Importance of Studying Programming Languages, History of Programming Languages, Impact of Programming Paradigms, Role of Programming Languages, Programming Environments. Impact of Machine Architectures: The operation of a computer, Virtual Computers and Binding Times.
- **Programming paradigms-** Introduction to programming paradigms, Introduction to four main Programming paradigms- procedural, object oriented, functional, and logic and rule based.

Text Books

T1. T. W. Pratt, M. V. Zelkowitz, "Programming Languages Design and Implementation‖, 4th Ed, PHI, ISBN 81-203-2035-2.

T2. Sebesta R., "Concepts of Programming Languages", 4th Edition, Pearson Education, ISBN- 81-7808-161-X.

Importance of Studying Programming Languages (T1, T2 Chapter 1)

1. Increased capacity to express ideas.
2. Improved background for choosing appropriate languages.
3. Increased ability to learn new languages.
4. Better understanding of the significance of implementation.
5. Better use of languages that are already known
6. Overall advancement of computing.

1. Increased capacity to express ideas

- It is believed that the depth at which we think is influenced by the expressive power of the language in which we communicate our thoughts. It is difficult for people to conceptualize structures they can't describe, verbally or in writing.
- Language in which they develop S/W places limits on the kinds of control structures, data structures, and abstractions they can use.
- Awareness of a wider variety of P/L features can reduce such limitations in S/W development.
- Can language constructs be simulated in other languages that do not support those constructs directly?

2. Improved background for choosing appropriate languages

- Many programmers, when given a choice of languages for a new project, continue to use the language with which they are most familiar, even if it is poorly suited to new projects.
- If these programmers were familiar with other languages available, they would be in a better position to make informed language choices.

3. Increased ability to learn new languages

- Programming languages are still in a state of continuous evolution, which means continuous learning is essential.
- Programmers who understand the concept of OO programming will have easier time learning Java.
- Once a thorough understanding of the fundamental concepts of languages is acquired, it becomes easier to see how concepts are incorporated into the design of the language being learned.

4. Better understanding of the significance of implementation

- Understanding of implementation issues leads to an understanding of why languages are designed the way they are.
- This in turn leads to the ability to use a language more intelligently, as it was designed to be used.

5. Ability to design new languages

- The more languages you gain knowledge of, the better understanding of programming languages concepts you understand.

6. Overall advancement of computing

- In some cases, a language became widely used, at least in part, b'coz those in positions to choose languages were not sufficiently familiar with P/L concepts.
- Many believe that ALGOL 60 was a better language than Fortran; however, Fortran was most widely used. It is attributed to the fact that the programmers and managers didn't understand the conceptual design of ALGOL 60.
- Do you think IBM has something to do with it?

Thank You