Computer Programming
Module-1 (Lecture-1)

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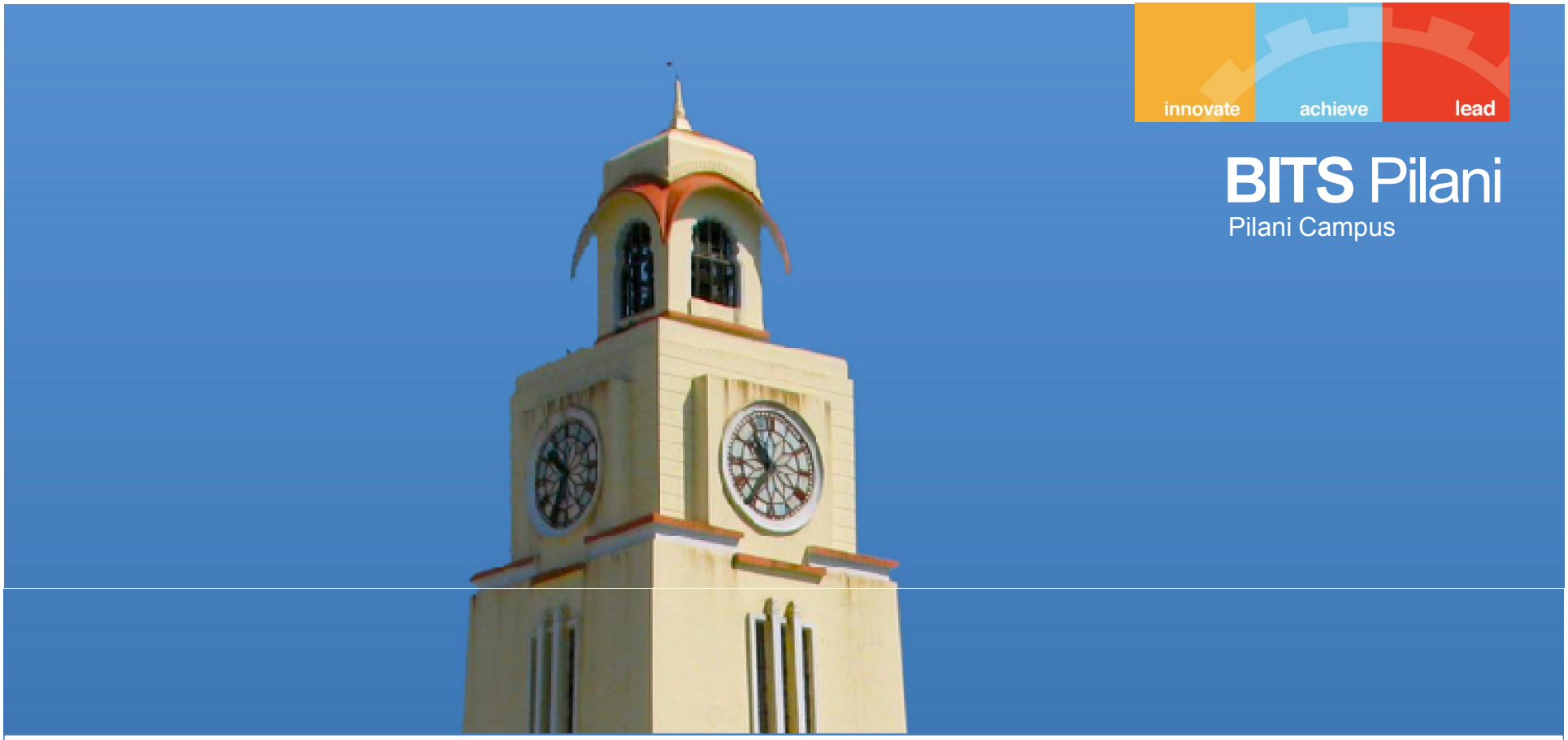

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Topics to be Covered:

Computers & Programming , Programming Languages Types, Problem Solving using Computers

What is a Computer?

- Computer is a computing device
  - Facilitate computation of anything that is computable
- Can we store all possible computations?
  - Answer: NO
- Then how it performs all computations?
  - Having facility to execute basic computation steps. Called as "***instruction set***"

What is programming?

- Instructing a computer to execute a sequence of steps (each step represents a **"built-in"** instruction) is called "**Programming**"
- Different computers have different instruction sets
  - May varied in terms of types as well as level of instructions (e.g. Simple or Complex)
  - Ex. ADD instruction in x86 and ADDV instruction in Cray computer

What is programming?

- Instruction set must be complete such that
  - any computation can be expressed as a sequence of steps
  - each step is achieved by an instruction available in the instruction set

Programming Languages-1

- Computer is an electronic device, made of electronic components
  - An electronic component can have two possible states either ON (1) or OFF (0)
  - Instructions must be represent in the form, in which a machine can understand i.e. "**Machine Language**"
- Any Drawbacks?

Programming Languages-2

- In the place of long sequence of 1s and 0s, computer operations can be represented by mnemonic codes-- "**Assembly Language"**
  - e.g. **ADD** for addition, **SUB** for subtraction …
  - Requires "**Assembler"** (i.e. converts assembly instructions into corresponding machine instructions)
- Any Drawbacks?

Programming Languages-3

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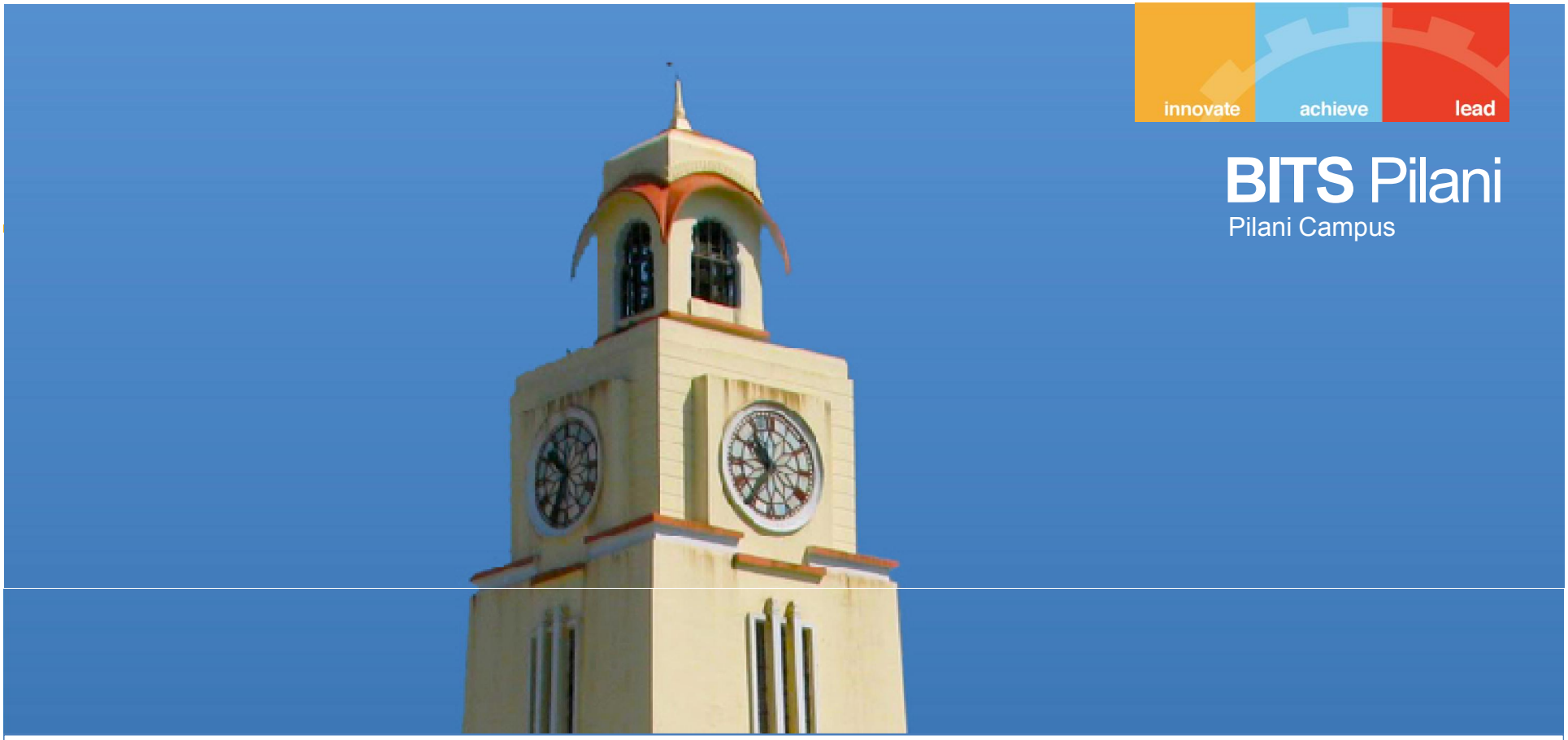
- To make program development process easier (i.e. Machine Independent)
  - a language which is similar to natural language like English is preferred, called as "**High Level Language**"
- More user friendly than so called low level languages (i.e. Machine and Assembly)
  - Requires "**Compiler Program**" to translate into the target computer's machine language
  - e.g. C, C++, Java, C#
- Any Drawbacks?

How to solve a problem?

- Basic Steps
  1. Specify the problem requirements
  2. Analyze the problem
  3. Design the algorithm to solve the problem
  4. Implement the algorithm
  5. Test and verify the problem solution (i.e. **"Program"**)
  6. Maintain/update the Program

Example Problem

- Problem statement
  - Convert currency value given in Dollars to Rupees and display the result



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Thank You!