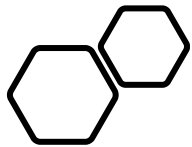




PROGRAMMING LANGUAGES COMPUTER SPECIAL CLASS

**SSC CGL / CHSL /
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22 Nov | 09:30 AM – 11:30 AM



PROGRAMMING LANGUAGES

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Programming Languages



WHAT IS LANGUAGE?

- A computer language is a set of symbols and rules used in constructing programs called syntax.
- Computer languages are used to develop application programs.

WHAT IS ALGORITHM?

- Step by step description that the program must perform to arrive at the solution.

EXAMPLE $73 * 46 = ?$

Step 1: Make a column for each factor. Start with 1 in the first column and 46 in the second column. Double the numbers in each column until the first column is as close as possible to the first factor, 73, without going past it.

Step 2: Start with the largest number in the first column. Find the other numbers in the first column whose sum is 73 ($64 + 8 + 1 = 73$), and check them off. Cross out the numbers in the unchecked rows in both columns.

Step 3: Add the remaining numbers in the second column ($46 + 368 + 2944 = 3358$).






$73 * 46$

$73 * 46$	
✓ 1	46
2	92
4	184
✓ 8	368
16	736
32	1472
✓ 64	2944
	3358

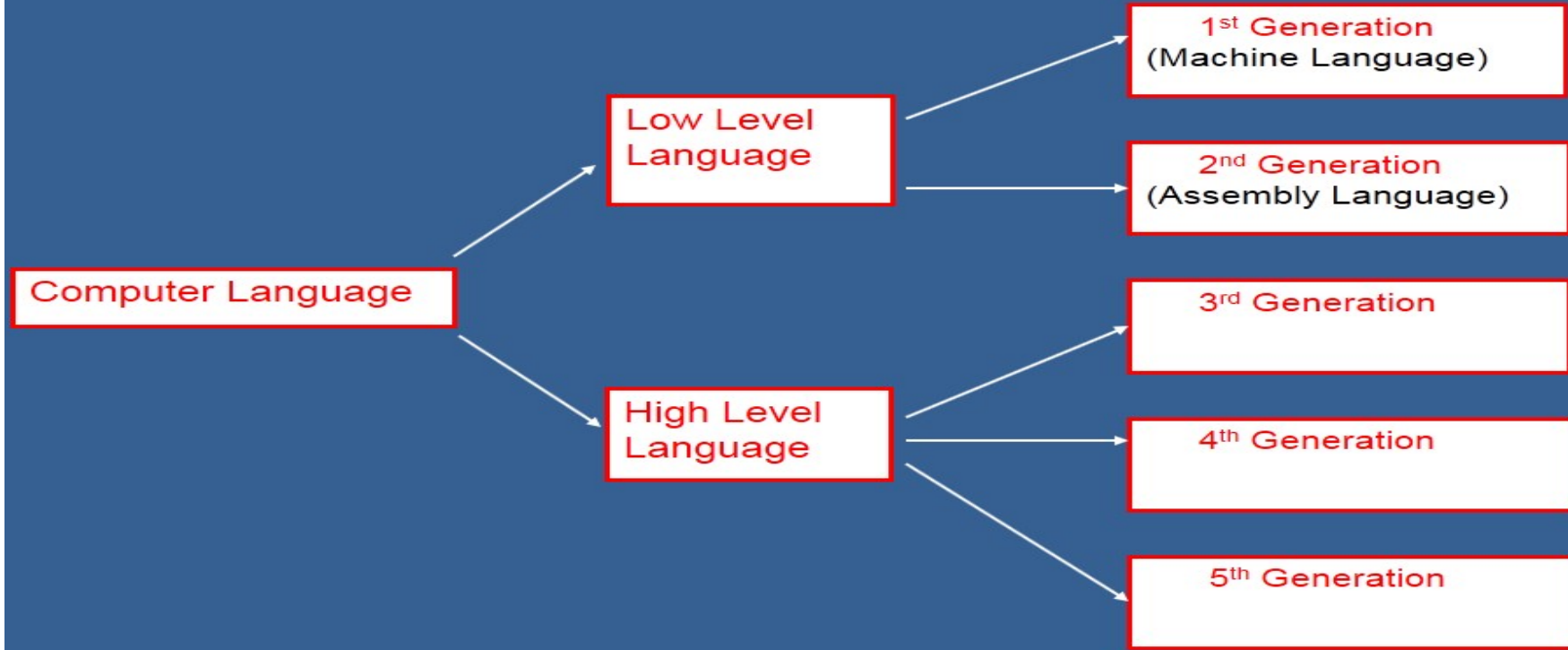
$73 * 46 = 3,358$

WHAT IS FLOWCHART?

➤ A popular logic tool used for showing an algorithm in graphics form.

Symbol	Name	Function
	Start/end	An oval represents a start or end point.
	Arrows	A line is a connector that shows relationships between the representative shapes.
	Input/Output	A parallelogram represents input or output.
	Process	A rectangle represents a process.
	Decision	A diamond indicates a decision.

CLASSIFICATION



LOW LEVEL LANGUAGES

- Machine dependant.
- Close to the hardware
- Should have hardware knowledge to write a program

Examples :

- Machine Language
- Assembly Language

MACHINE LANGUAGE

- 1st Generation language (1GL)
- Consists of 1s and 0s.
- No translator is used.
- Difficult to write and modify.
- Machine dependant

ASSEMBLY LANGUAGE

- **2nd Generation languages(2GL)**
- **Mnemonics are used to write codes**
- **Assembler converts program into machine language.**
- **Machine dependant**

HIGH LEVEL LANGUAGES

- Machine independent.
- Easy to write and modify.
- Does not need knowledge of hardware.
- Productivity is high.
- Consume less time to write programs
- 5GL allow user-friendly facilities

PROGRAMMING LANGUAGE PARADIGMS

Procedural:

procedures, sequential execution of code are basic building blocks of program

- **FORTRAN** (FORmula TRANslating; John Backus, IBM, 1950s)
- **ALGOL** (ALGOarithmic Language, 1958)
- **COBOL** (Common Business Oriented Language, 1960)
- **BASIC** (Beginner's All-purpose Symbolic Instruction Code, John Kemeny and Thomas Kurtz, Dartmouth, 1964)
- **Pascal** (Niklaus Wirth, 1970)
- **C** (Dennis Ritchie, Bell Labs, 1972)

PROGRAMMING LANGUAGE PARADIGMS

Object-Oriented:

Program is designed around the *objects* required to solve the problem

- Smalltalk (Alan Kay, Xerox PARC, 1971)
- Ada (US Dept of Defense, 1975)
- C++ (Bjarne Stroustrup, Bell Labs, 1983)
- Java (James Gosling, Sun Microsystems, 1995)
- C# (Microsoft, 2000)

PROGRAMMING LANGUAGE PARADIGMS

Non-procedural languages

- HTML
Hyper Text Markup Language
- JSP
Java Server Page
- ASP
Active Server Page
- SQL
Structured Query Language

TRANSLATORS

Translator is used to convert source code into object code.

These are of three types

- Assembler
- Interpreter
- Compiler



ASSEMBLER

- is a low-level language Translator.
- is a software program that converts assembly language into machine language
- converts mnemonics into machine code



INTERPRETER

- is a translator that goes through the process of translation every time the program is run.
- is found running some versions of BASIC, where it translates one line of the program at a time.



COMPILER

- is a translator of high level languages
- converts a whole program into machine language at once
- translates source code into Object Code. This Object code is used to execute whenever it is run



PROGRAMMING ERRORS

➤ Bugs

Causes unexpected result **in a program.**

➤ Types of error-

➤ Syntax Error

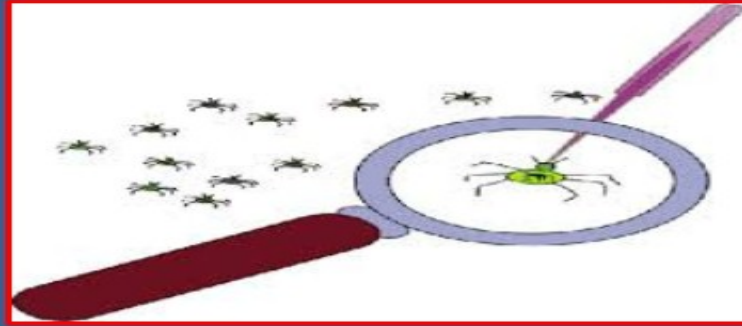
occurs at compile time.

➤ Logical Error

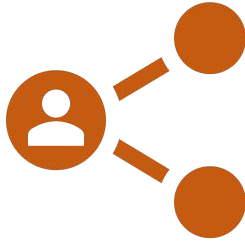
occurs at run time.



DEBUGGING



- Performs line by line execution.
- Used to fix the bugs in a program



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