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INTRODUCTION TO COMPUTERS & PROGRAMMING

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What is a computer?

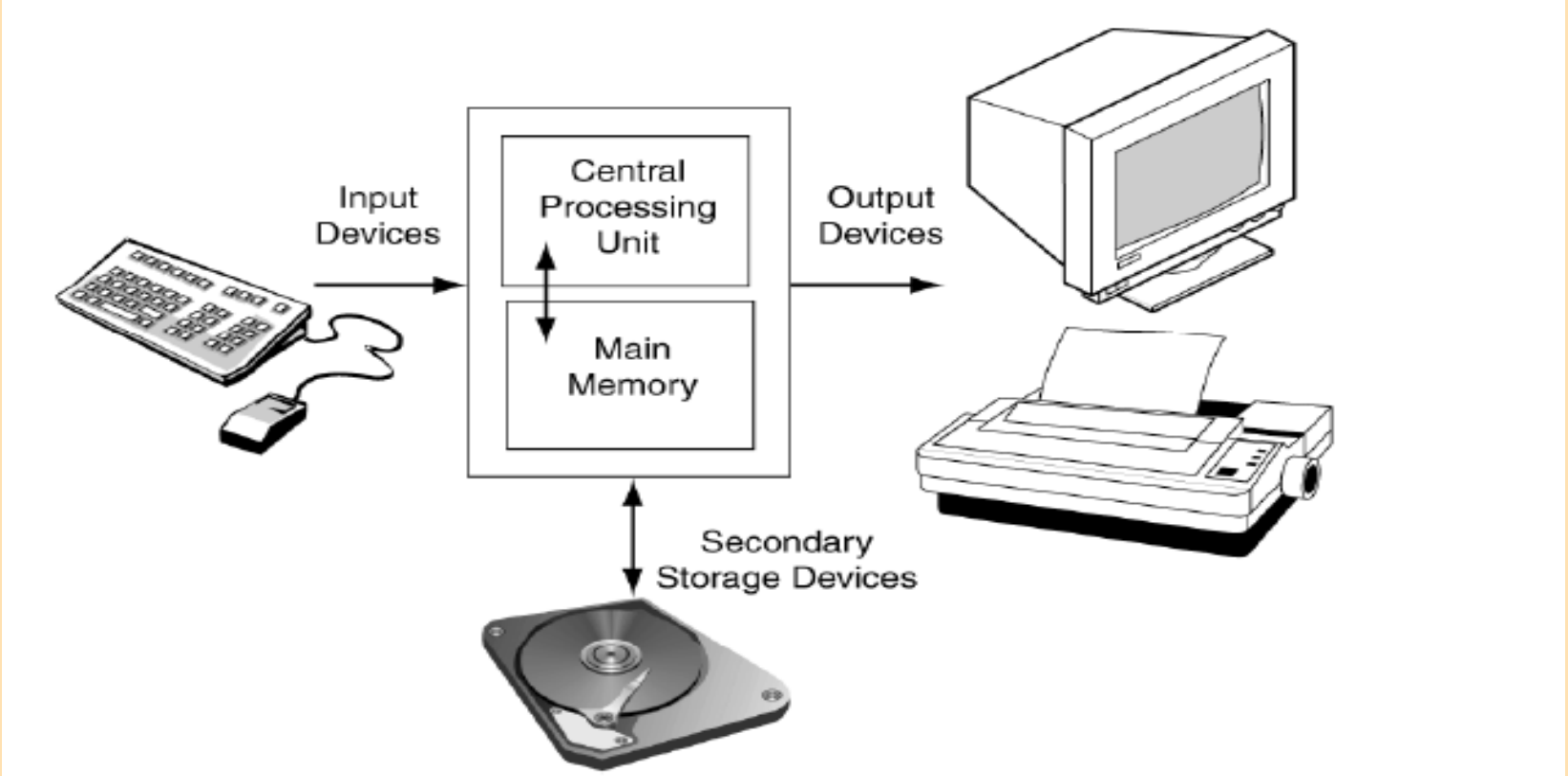
- Machine that processes data to produce a desired output.
- Programmable machine designed to follow instructions

What is a computer program?

- A computer program is a set of statements or instructions to be used directly or indirectly in a computer in order to bring about a certain result.
- Examples of computer program or computer application: Microsoft Word, Dev C++, Google Chrome, Internet Explorer.

Computer Components: Hardware

- The physical components of a computer



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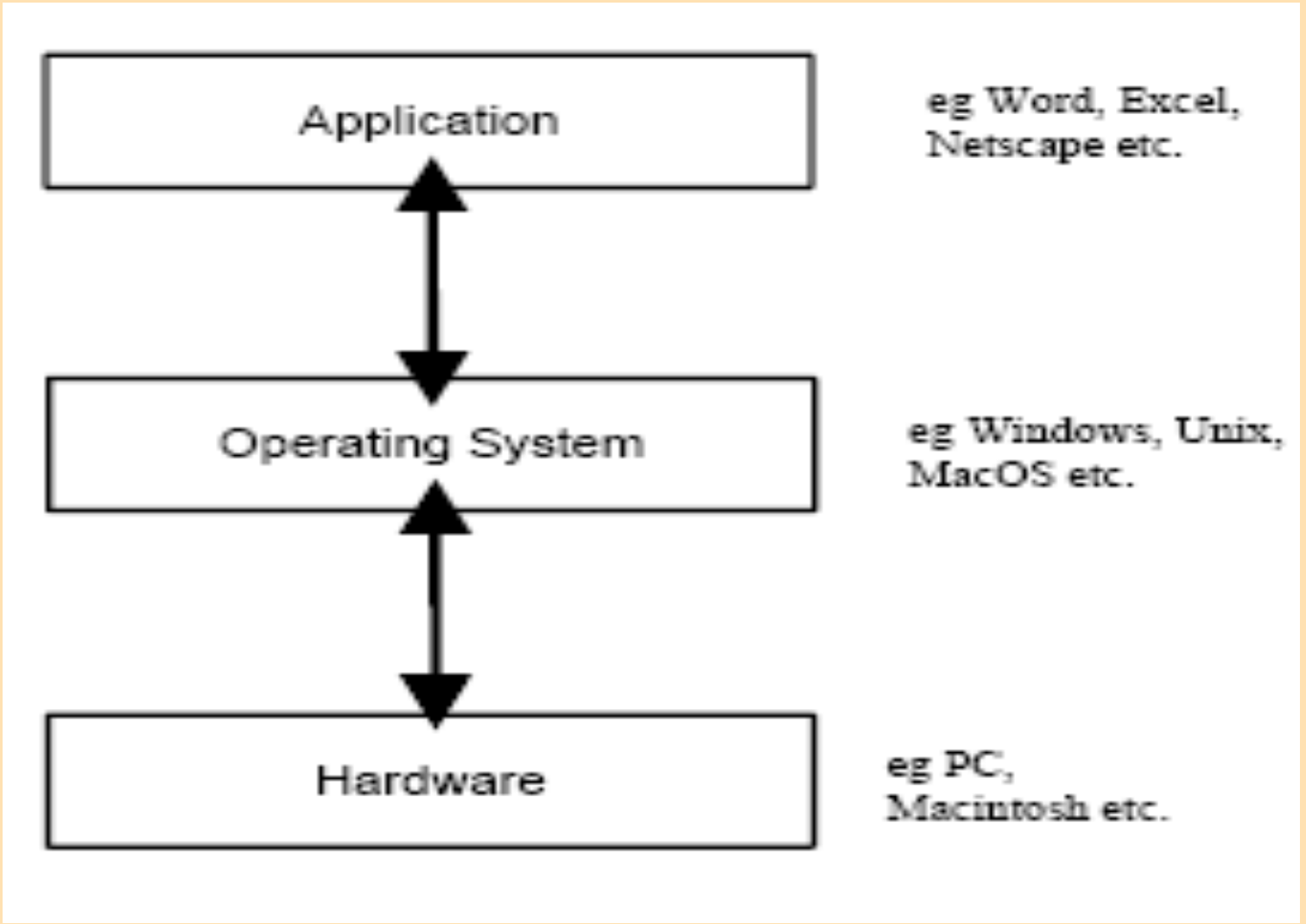
Computer Components: Software

- Programs that run on a computer
- Categories of software:
  - System software
    - programs that manage the computer hardware and the programs that run on them.
  - Application software
    - programs that provide services to the user
  - Compilers
    - Translates computer programs to machine language.
    - Machine language: the only language the computer can understand. It is in binary machine code (0's/1's).

Layers of software



Programs & Programming Language

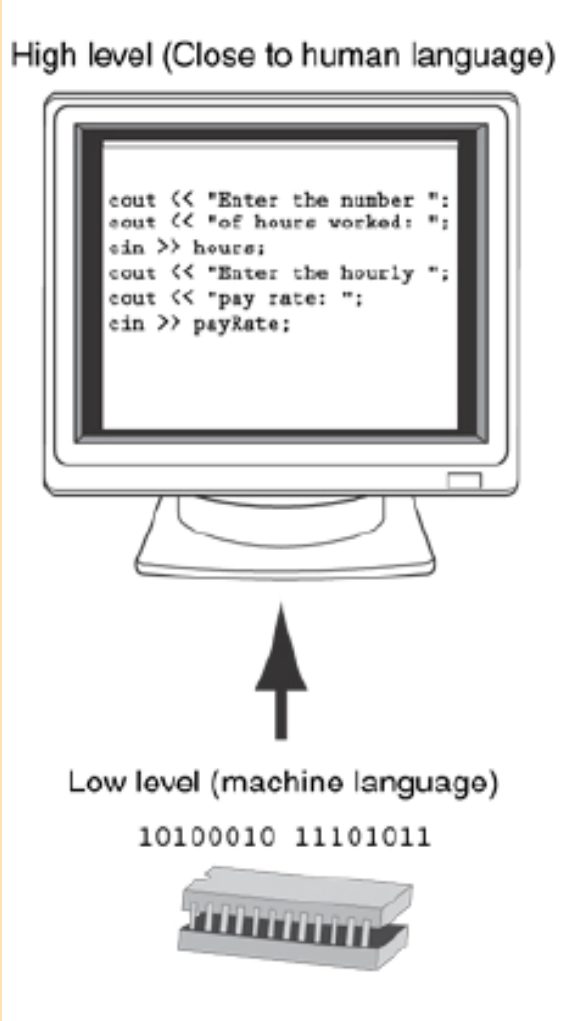
- A program is a set of instructions that the computer follows to perform a task
- Programming Language: a language used to write programs
- We start with an *algorithm, which is a set* of well-defined steps.

Algorithm Example: Calculating Gross Pay

1. Display a message on the screen asking "How many hours did you work?"
2. Wait for the user to enter the number of hours worked. Once the user enters a number, store it in memory.
3. Display a message on the screen asking "How much do you get paid per hour?"
4. Wait for the user to enter an hourly pay rate. Once the user enters a number, store it in memory.
5. Multiply the number of hours by the amount paid per hour, and store the result in memory.
6. Display a message on the screen that tells the amount of money earned. The message must include the result of the calculation performed in Step 5.

Type of Programming Language

- Low-Level Programming Language / Assembly Language
  - Similar to machine languages, but they are much easier to program.
  - Each CPU has its own assembly language.



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Type of Programming Language

- High-Level Programming Language
  - A language that people can read, write, and understand.
  - A programming language that is more user-friendly, to some extent platform-independent
  - Need to be translated into one or several machine instructions by a **compiler.**
  - **Example:** Java, C, C++

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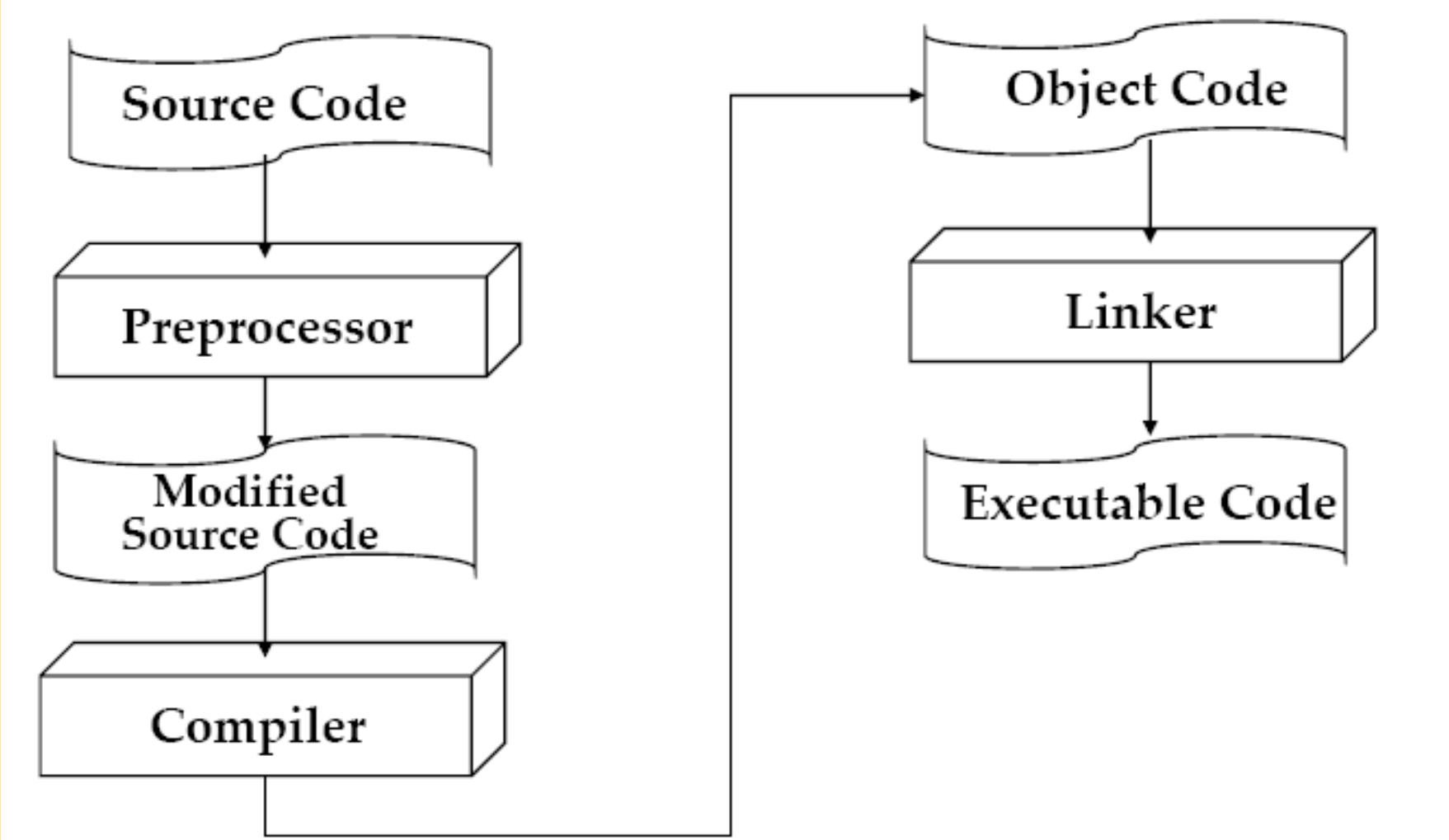
From High-Level to Executable File



Integrated Development Environment (IDE)

- An integrated development environment, or IDE, combine all the tools needed to write, compile, and debug a program into a single software application.
- Examples are Dev C++, Microsoft Visual C++, Borland Delphi, Borland C++, etc.

Procedural and Object-Oriented Programming

- Procedural programming (a.k.a structured programming) is centered on procedures or functions (a.k.a modules). Example language: C.
- Object-oriented programming (OOP), is centered on objects. An object contains data and procedures. Example language: C++

FYE Program Reminder: Treasure Hunt

- Date: Wed, 12/9/2012
- Time: 2.00 p.m
- Venue: Dewan Seminar, D07

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