Development of Computer

- Story of Steve

What is a computer

- A high intelligence machine
- A tool – make our life much convenient
- A very loyal servant
- Pretty dumb---why?

How computer works

- Computer only manipulate binary numbers, a sequence of 1's and 0's, basically addition operation
- You need to give computer very detail, very precisely commands, you need to define everything clearly in the computer language

PC XT 286

- **ORIGIN** U.S.A.
- **YEAR** 1986
- **SPEED** 6 MHz
- **RAM** 1 MB
- **CGA modes** : 640 x 200
- **HARD DISK:** 40 MB

PC 386 – PC 486 - Pentium

- **ORIGIN** U.S.A.
- **YEAR** 1996
- **SPEED** 60 MHz
- **RAM** 8 MB
- **SVGA modes** :1024 x 768
- **HARD DISK: 500** MB

Pentium 4 – Centrino (Pentium M)

- Nowadays, what is the computer look like
- The trend:
  - Smaller   - Wireless
  - Faster   - Artificial Intelligence
  - Portable   - Embedded System
  - Power Saving   - Big Memory
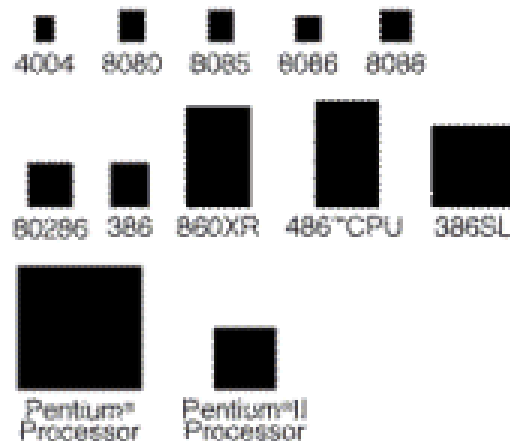 - Reliable   - Integrated

Moore's law

- In 1965 Intel co-founder Gordan Moore noted that processing power (number of transistors and speed) of computer chips was doubling each 18 months or so. This trend has continued for nearly 4 decades.
- It has been proved to be true in all the other computer science

Problem #1: The electronic integration
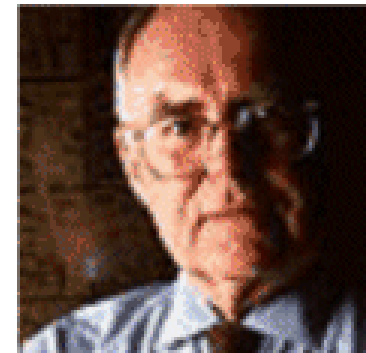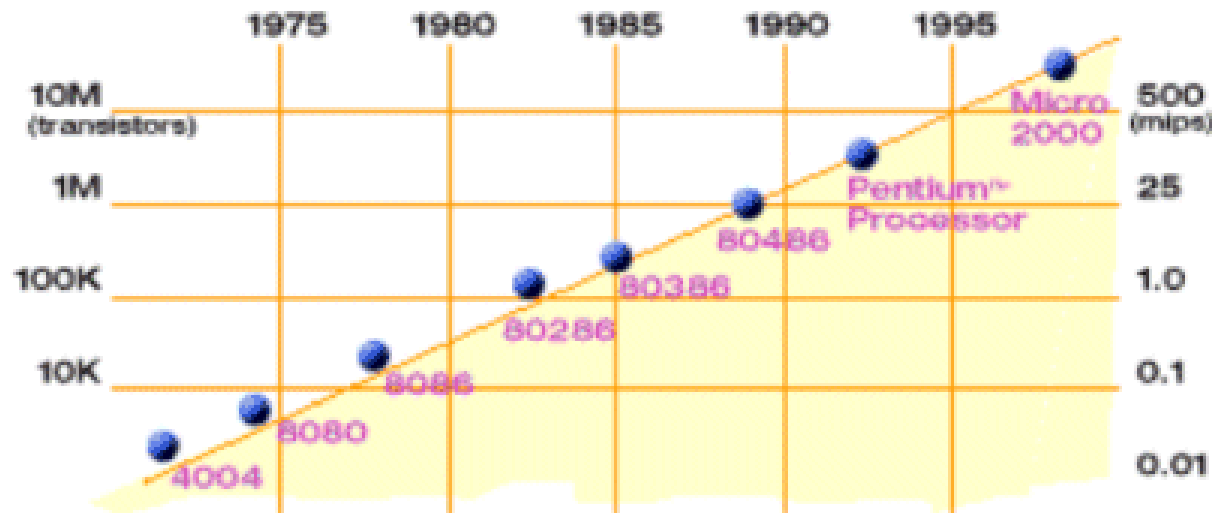
Gordon Moore. Intel co-founder

- Moore´s Law: every 18 months the VLSI complexity is doubled.

Types of Languages

- Computers require a method of instruction to operate,. Modern computers get their instructions from **programming languages**.

- A programming language is an agreed-upon format of symbols that enables a programmer to instruct a computer to perform certain predefined tasks.

- There are two types of languages depending on how understandable they are: **high-** and **low-level languages**.

The Development of Programming Languages

- Manual switches using binary numbers
- Assembly language
- COBOL and FORTRAN – allowed programs to be run on another system than the original
- C – originally used for developing operating systems, but became very popular
- C++ and other object-oriented languages – enabled creation of reusable programs
- Java – like C++, but can be run on any computer without recompiling

Interpreters, Compilers, and JITs

- High-level languages like Visual Basic .NET must be converted into a language the machine understands before it can execute it. There are three main methods for accomplishing this task:

- Interpreting. An **interpreter** is a program that converts the language at the time the application is executed. This leads to slow executing applications.

- Compiling. A **compiler** will perform all of the translation at once and store the results in a file called an **executable**. This results in a faster execution but one which is compiled for a specific computer chip.

- Just-in-time compiling (**JIT**). JIT compilers compile the source code into an intermediate language which is then translated just in time to be executed by the computer. Visual Basic .NET and Java use this method.