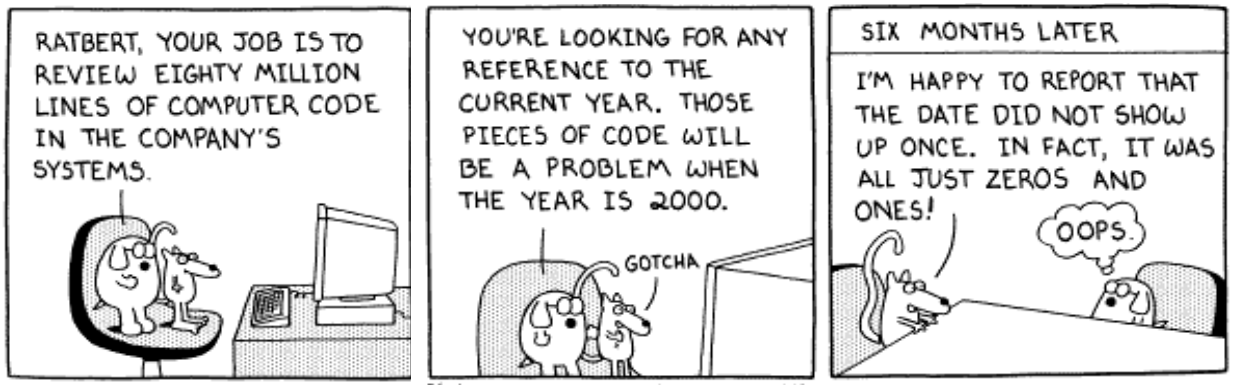
ORF 201

COMPUTER METHODS FOR PROBLEM SOLVING

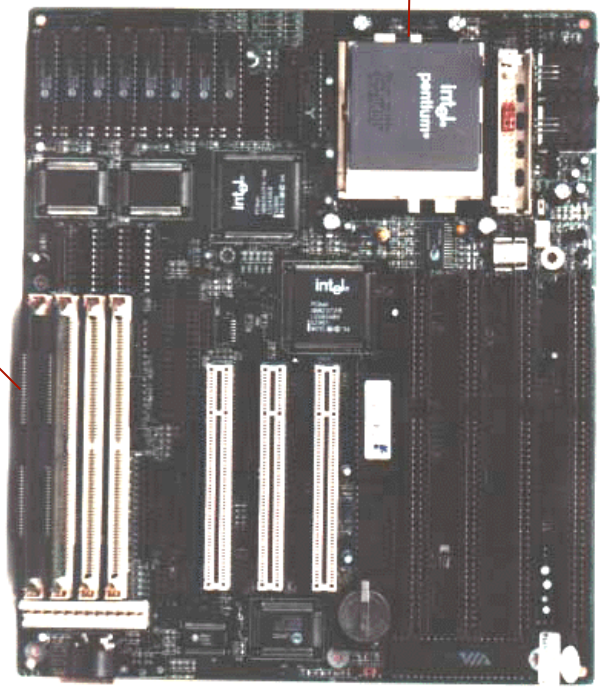
Lecture 1

Hardware, Software, History



http://www.princeton.edu/~orf201

Hardware



Central Processing Unit (CPU)

Device Ports

Clock

Random Access Memory Chips (RAM)

Motherboard

Inputs

CD-ROM (Read Only Memory)

Floppy Disk Drive

Monitor

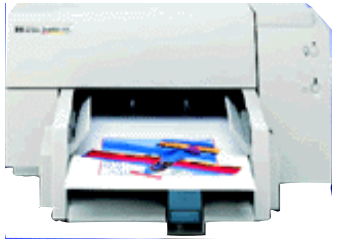
Keyboard

Speakers

Mouse

Outputs

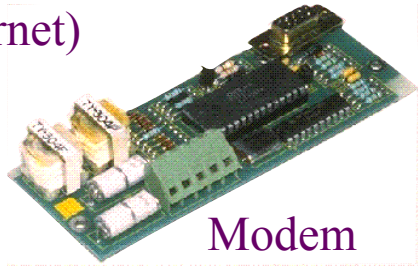
Printer



Hard Disk

Ethernet (connection to Internet)

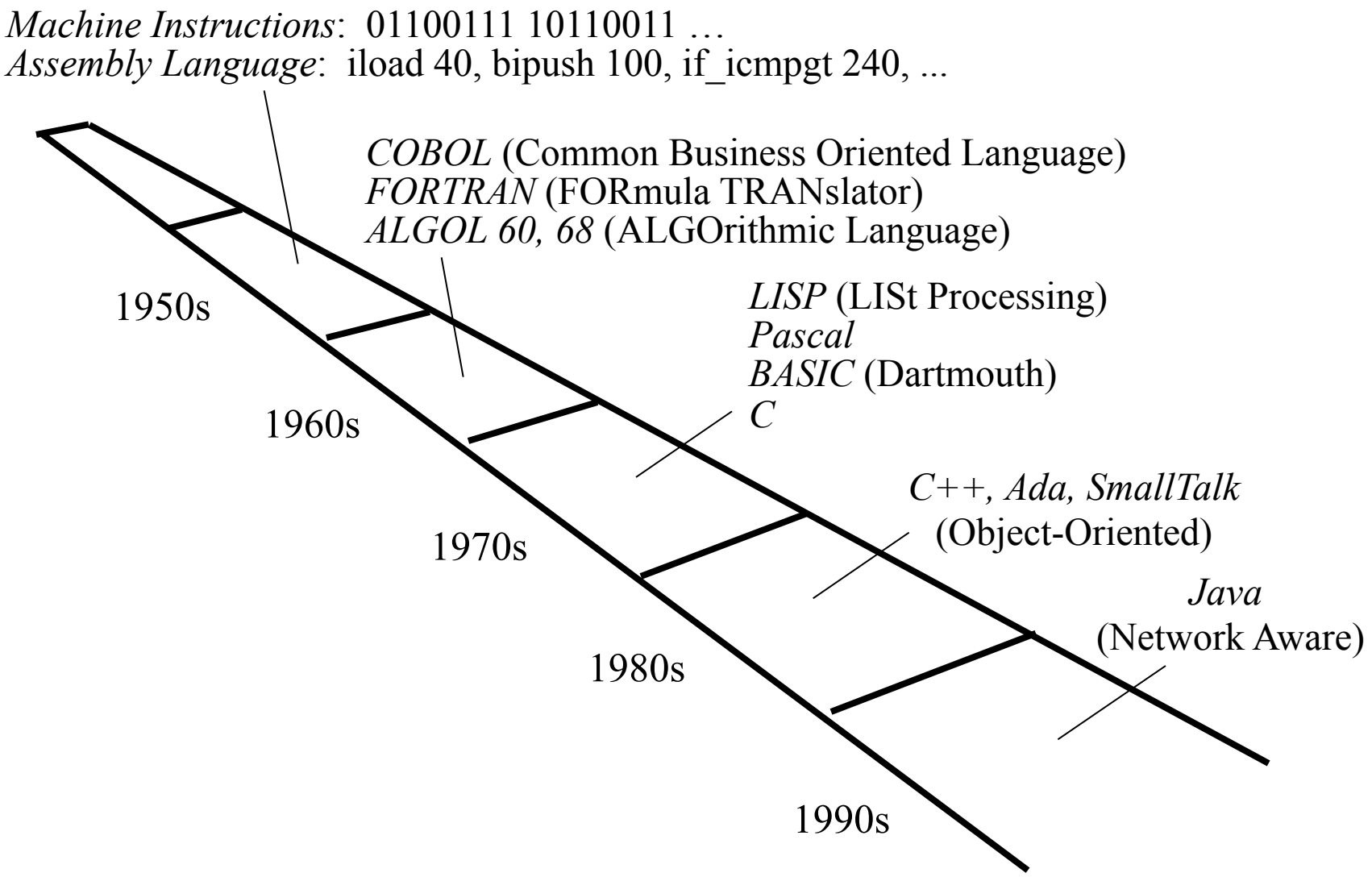
Input/Output



Modem

Devices

Software -- Computer Languages



Software -- Operating Systems

JCL

JCL: Job Control Language

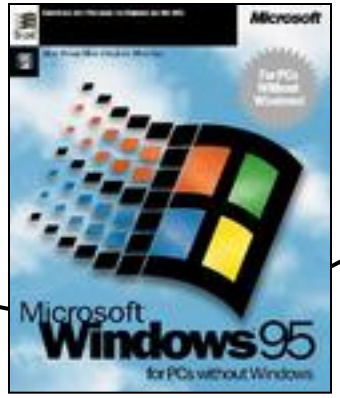
VMS: IBM mainframe and clones

UNIX: Workstations and supercomputers, multitasking, multiuser, network capable

DOS: PC Operating system, small, single user, kludge

DOS

MacIntosh Operating System: Idiot proof



Windows 95: PC

Windows NT: PC, trying to be like UNIX

Hello World

The file **`Hello.java`**

Every file must have one **`public class`**

Point of entry is **`main()`**

All code must be in a **`class`**

```
public class Hello
{
    public static void main(String[] args)
    {
        System.out.println("Hello, World!");
    }
}
```

To compile:
`javac Hello.java`

To run (execute):
`java Hello`

Output:
`Hello, World!`

Fahrenheit to Celsius

```
/* Program to print a Fahrenheit to Celsius
   conversion table for fahr = 0, 20, …, 300 */
public class FahrCels
{
      public static void main(String [ ] args)
      {
         int fahr, celsius;

         fahr = 0;
         celsius = 5 * (fahr-32) / 9;
         System.out.println(fahr + "\t" + celsius);

         fahr = 20;
         celsius = 5 * (fahr-32) /9;
         System.out.println(fahr + "\t" + celsius);
         .
         .
         Fahr = 300;
         celsius = 5 * (fahr-32) / 9;
         System.out.println(fahr + "\t" + celsius);
      }
}
```

Anything between **/*** and ***/** is ignored by the compiler.

int is the integer data type

fahr and **cels** are *instances* of **int**

= is the *assignment operator.*

Statements are executed in sequence. End with semicolon.

Arithmetic operators: **+**, **-**, *******, **/**

"\t" is the *tab string*

Fahrenheit to Celsius 2

```
/* Program to print a Fahrenheit to Celsius conversion
   table for fahr = 0, 20, …, 300 */

public class FahrCels2
{
    public static void main(String [ ] args)
    {
        int fahr, celsius;
        int lower, upper, step;

        lower = 0;     /* lower limit of temp table */
        upper = 300;   /* upper limit */
        step = 20;     /* step size */

        fahr = lower;
        while (fahr <= upper) {
            celsius = 5 * (fahr-32) /9;
            System.out.print(fahr);
            System.out.print("\t");
            System.out.println("celsius");
            fahr = fahr + step;
        }
    }
}
```

Declare

Initialize

Compute

while (…) {…}

Logical operators:

<, >, <=, >=, ==, !=

print vs. **println**

Run It

To compile:

```
javac FahrCels2.java
```

To run:

```
java FahrCels2
```

The output:

```
0       -17
20      -6
40      4
60      15
80      26
100     37
120     48
140     60
160     71
180     82
200     93
220     104
240     115
260     126
280     137
300     148
```