



# A Brief Introduction to Java

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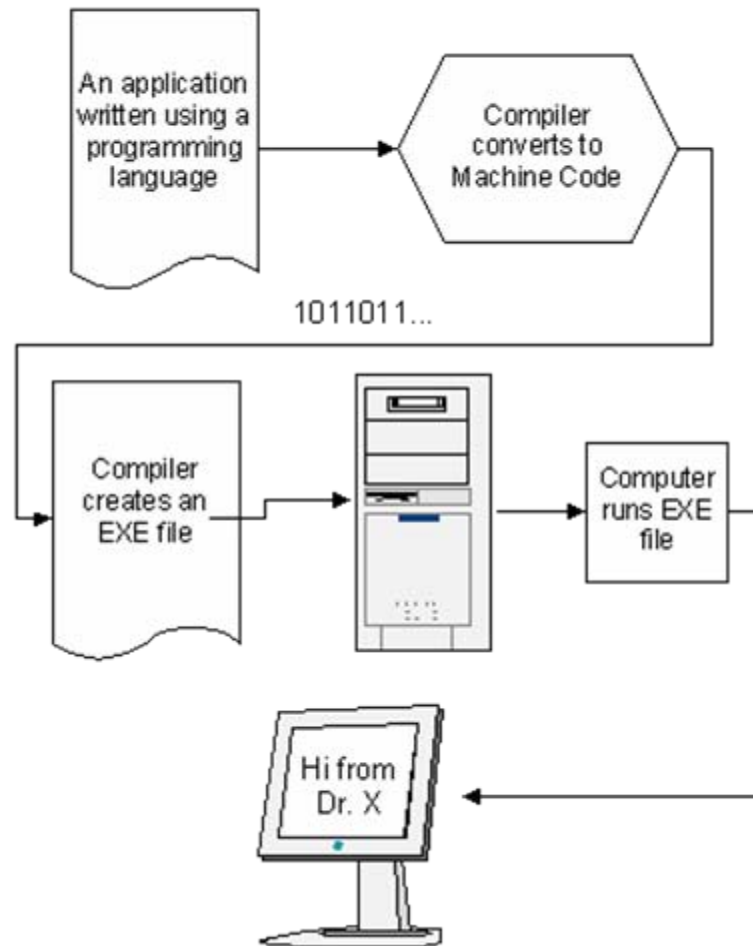
# Outline

1. Computer language
2. An overview of Java
3. Data structure and control flow
4. HTML and Applet basics
5. GUI

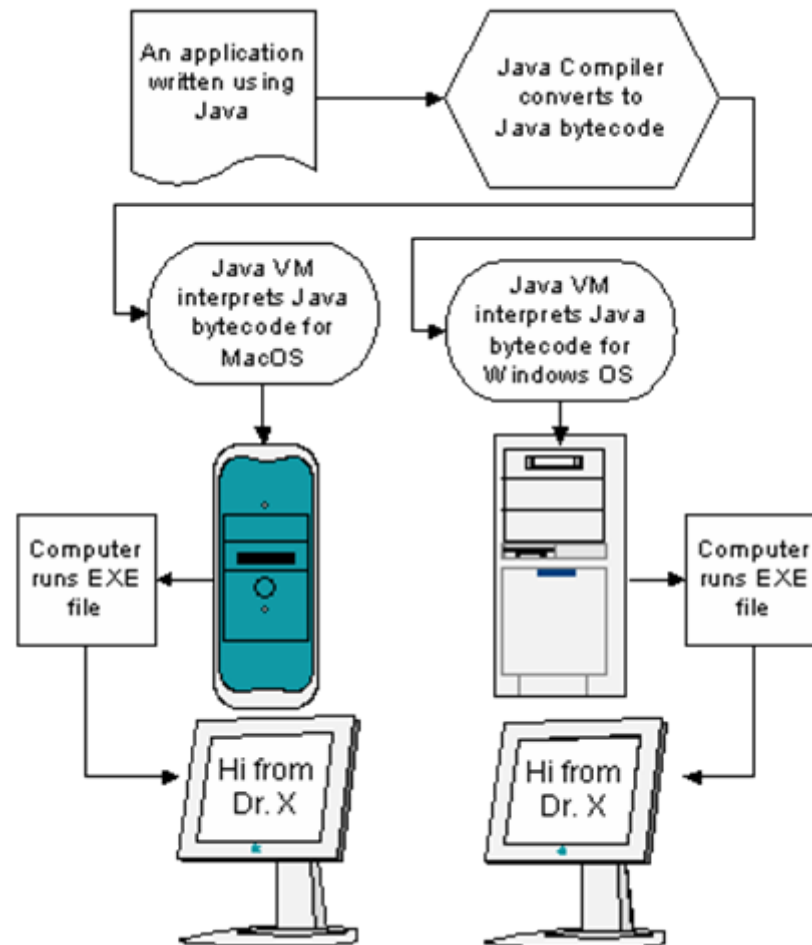
# 1. Computer language

- Machine language / code – what the computer can only understand (0&1)
  - TOO difficult for us
- Source code – can be easily understood by human beings
  - Needs compilation / interpretation

# 1.1 A common process of compilation



# 1.2 Compilation/Interpretation of Java



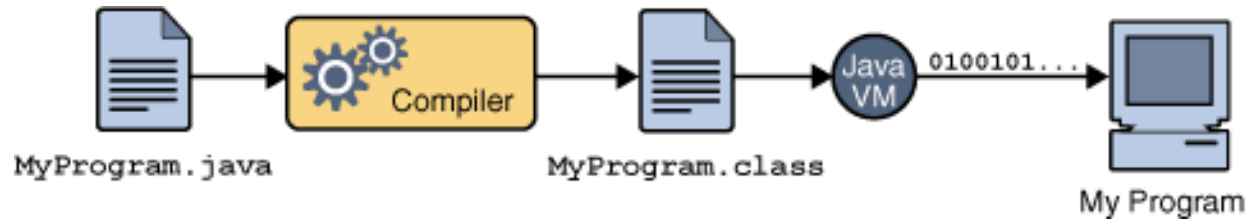
# 2.1 Features of Java



- Simple
- Object oriented
- Distributed
- Multithreaded
- Dynamic
- Architecture neutral
- Portable
- High performance
- Robust
- Secure

Source: <http://java.sun.com/docs/books/tutorial/getStarted/intro/definition.html>

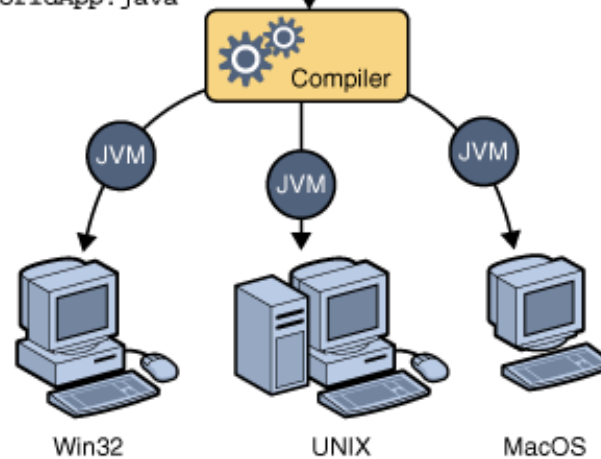
# 2.2 JVM



Java Program

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

HelloWorldApp.java



## 2.3 JRE & JDK

Sun Microsystems provides two principal software products in the Java Platform, Standard Edition (Java SE) family:

### ■ **Java SE Runtime Environment (JRE)**

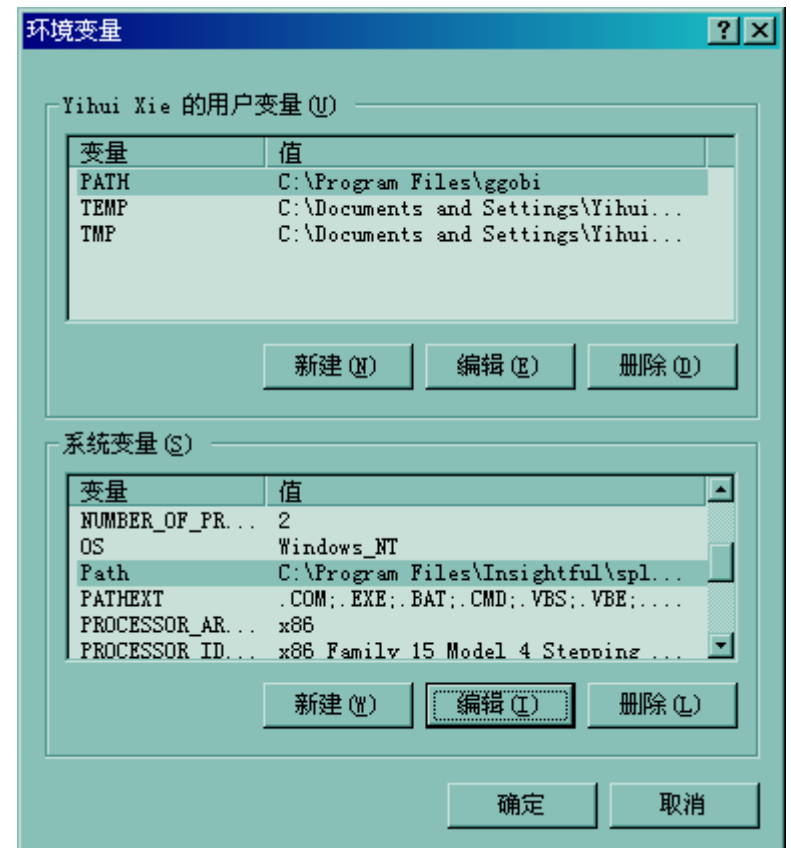
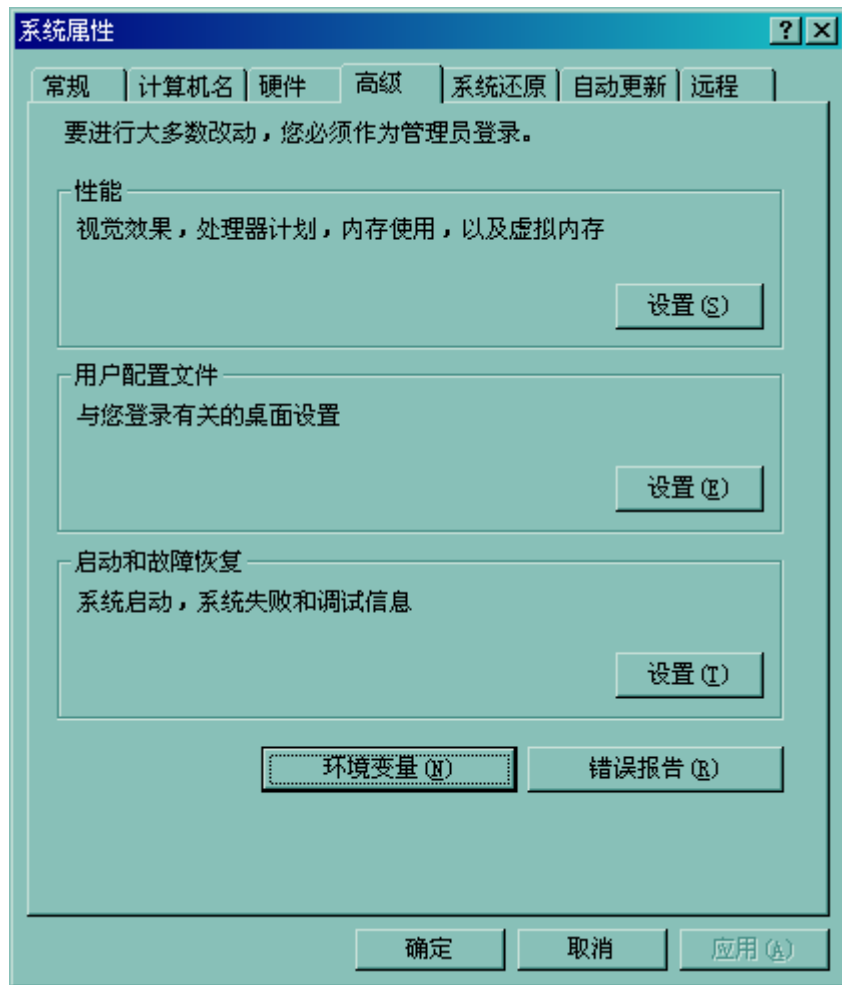
- The JRE provides the libraries, Java virtual machine, and other components necessary for you to *run* applets and applications written in the Java programming language.

### ■ **Java SE Development Kit (JDK)**

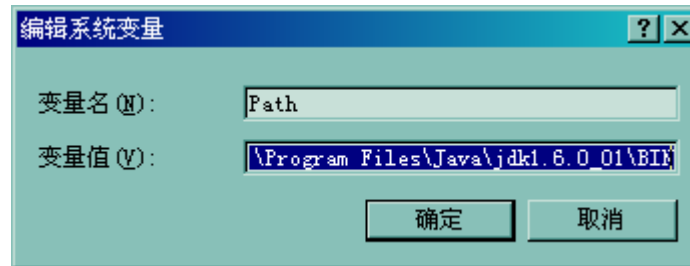
- The JDK includes the JRE plus command-line development tools such as compilers and debuggers that are necessary or useful for *developing* applets and applications.



# 2.4 Configurations



## 2.4 Configurations (cont'd)



GTK\_BASEPATH%\bin;C:\PROGRA~1\CTeX\LOCALT~1\ty\b  
in;C:\PROGRA~1\CTeX\LOCALT~1\cct\bin;C:\PROGRA~1\C  
TeX\texmf\miktex\bin;C:\PROGRA~1\CTeX\gs\gs8.51\bin;C:\  
PROGRA~1\CTeX\WinEdt;%SystemRoot%\system32;%Syste  
mRoot%;%SystemRoot%\System32\Wbem;**C:\Program  
Files\Java\jdk1.6.0\_01\BIN**

## 2.5 Code Editor

- Any text editor is OK (e.g. notepad)
- Eclipse (free)
- Tinn-R

# 3. Data structure and control flow

- Data type
- Control flow

# 3.1 Data Type & Creating Variables

## ■ Data types:

- byte short int long float double
- char
- boolean
- String StringBuffer Arrays

## ■ Creating variables:

- type variable;
- type variable = expression;

## 3.2 Basic output

- `System.out.println();`
- `System.out.print();`

## 3.3 Basic input

- `System.in.read();`
- Type transferring:
  - `(type) expression;`
  - e.g.
    - `(char) input_data;`
    - `(char) System.in.read()`
- throws `java.io.IOException`

## 3.4 Arithmetic Operators

- +
- -
- \*
- /
- %
- Special: ++, --, +=, etc



## 3.5 Arrays & String

- `int[] number = new int[100];`
  - from `number[0]` to `number[99]`
- `String message = new String();`
  - `message = "Hello, I'm Java string!";`
- `String[] args`
  - `args[0], args[1], ...`

## 3.6 StringBuffer

- `StringBuffer var = new StringBuffer();`
- `StringBuffer var = new StringBuffer(40);`
- `StringBuffer var = new StringBuffer("Hi");`
- `var.append();`
- `var.insert();`

# 3.7 Control flow

## ■ Operators

- `==; <; >; <=; >=; !=;`

- `&&; ||;`

## ■ Conditional execution

- `if (test)`
  - `{ statement(s); }`
  - `else`
    - `{ statements(s); }`

## 3.7 Control flow (cont'd)

- `if (test1)`  
    `{ statement(s); }`  
`else if (test2)`  
    `{ statement(s); }`  
  
    ...  
`else`  
    `{ statement(s); }`

## 3.7 Control flow (cont'd)

- `switch(var)`

```
{
```

```
    case value1: statement(s); break;
```

```
    case value2: statement(s); break;
```

```
    ...
```

```
    default: statement(s); break;
```

```
}
```

## 3.7 Control flow (cont'd)

### ■ Repetitive execution

- for (var = start\_value; end\_test; change)  
    {statement(s);}
- for (counter = 0; counter < 10; counter++)
- while(test)  
    {statement(s);}
- do  
    {statement(s);}  
    while(test);

## 3.8 Method & Function

- `public static void somefun(par, ...)`
- `public static int somefun(par, ...)`
  - `return sth;`

# 4. HTML and Applet basics

- Hyper Text Mark-up Language

- `<tag> </tag>`

- `<html> </html>`

- `<body> </body>`

- `<table> </table>`

- ...

- Applet



# 4.1 Basic methods

- `init()`
- `start()`
- `stop()`
- `paint()`
  - `public void paint(Graphics g)`  
    {  
    }

## 4.2 Show texts

- `g.drawString(sometext, top, left)`
- Font
- Color
- Mouse Control
  - `public boolean mouseDown(Event e, int x, int y)`
  - `public boolean mouseDrag(Event e, int x, int y)`

## 4.3 Applet Parameters

```
<html>
```

```
<body>
```

```
  <applet code=StartStop.class  
  width="500" height="300">
```

```
    <param name=*** value=*** >
```

```
    <param name=*** value=*** >
```

```
  </applet>
```

```
</body>
```

```
</html>
```

# 5. GUI

- Button, Canvas, Checkbox, CheckboxGroup, Choice, Label, List, TextField, TextArea, Layout, Panel, ...
- drawLine(), drawRect, fillRect(), drawOval(), fillOval(), drawPolygon(), fillPolygon(), drawPolyline(), fillArc(), drawArc(), ...



# Thanks!