# JAVA PROGRAMMING: A STUDENT-FRIENDLY APPROACH

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# Chapter 1

## Simple Java Program

# Problems with computers

- Computers have to be programmed.
- Programming is difficult to do correctly. Computers often do not work properly because of faulty programming.

But . . .

# Computers are everywhere

The reason:

Computers are incredibly versatile because they are programmed.

So the principal problem with computers (they have to be programmed) is the principal reason we use them.

## Decimal

2   3   5    digits

$$10^2 \; 10^1 \; 10^0 \quad \text{weights}$$

$$\text{Value} = 2 \times 10^2 + 3 \times 10^1 \; + \; 5 \times 10^0 = 235 \text{ decimal}$$

## Binary

1   1   1    bits

$$2^2 \quad 2^1 \quad 2^0 \quad \text{weights}$$

$$\text{Value} = 1 \times 2^2 \; + \; 1 \times 2^1 \; + \; 1 \times 2^0 = 7 \; \text{decimal}$$

# Java is free format

```
System.out.println(20+3);

System.out.println(20 + 3);


System
.
Out
.
println
(
20
+
3
)
```

# Illegal statement

```
S ystem.ou t.pri ntln(2 0 + 3);
```

No embedded spaces allowed within a token

```
class class name
{

        .

        .

        .

}
```

# Method

A named sequence of statements

```
Method header
{
    statements
}
```

# Simple program

One method inside a class:

```
class class name
{
    method header
    {
        statements
    }
}
```

# First Program

class name

method name        parameter

```
class Program1
{
    public static void main(String[] args)    } method header
    {
        System.out.println(20 + 3);               method
        System.out.println("20 + 3");              body
    }
}
```

# Watch your cases

| yes | no |
|-----|-----|
| `class` | `Class` |
| `public` | `Public` |
| `static` | `Static` |
| `main` | `Main` |
| `String` | `string` |
| `System` | `system` |

## Compile with

```
javac Program1.java
```

## Run with

```
java Program1
```

```
23
20 + 3
```
⎫
⎬ Output generated by program
⎭

# Again, watch your case

Must match class name exactly

```
class Program1
{
   . . .
}
```



```
java Program1
```

# Logic error

```
System.out.println(200 + 3);
```

Want to compute  20 + 3

*Just because a computer provides an answer for some problem does not mean the answer is correct.*
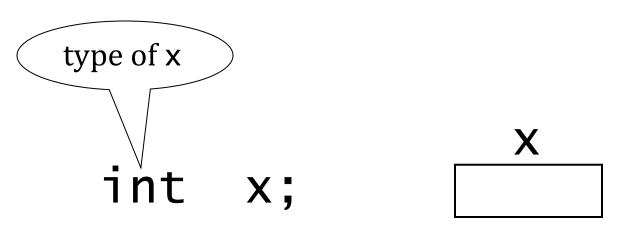
# Compile-time error

```
System.out.println[5];
```

# Run-time error

```
System.out.println(5/0);
```

# Declaring a variable

type of x

```
int  x;
```

x

Can store integer values only in x.

$$x = 2 + 5;$$

x

| 7 |
|---|