

James Gosling
(FATHER OF JAVA)
started the Project
in early '90s

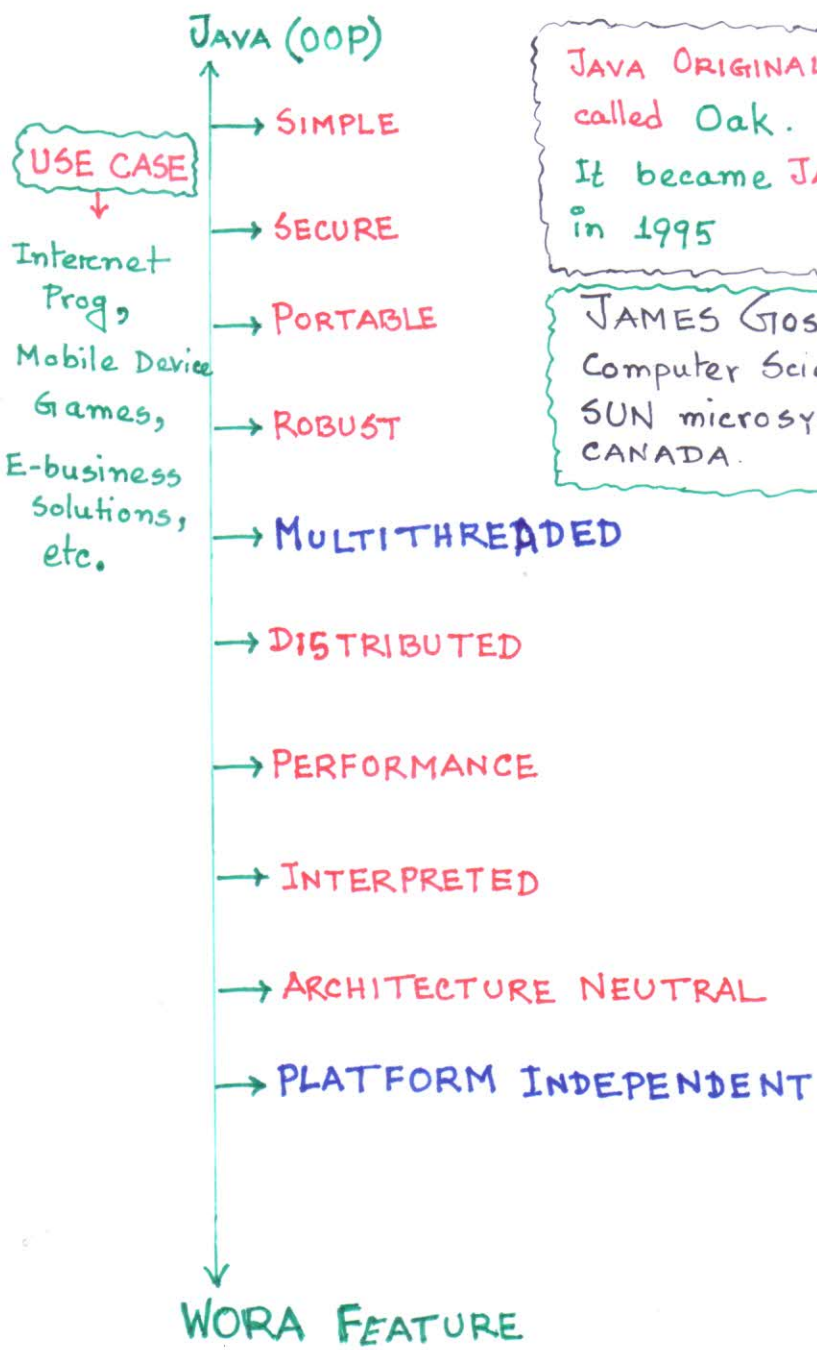
JAVA BUILDING BLOCK (JABS)

5 STAIRS 5 PART 1

About Java: JAMES GOSLING, SUN MICROSYSTEM, COMPUTER SCIENTIST (CANADA)
Java program can execute in any environment.

For which there is a Java Run-time System (JVM).

Java is an Object oriented programming (OOP).



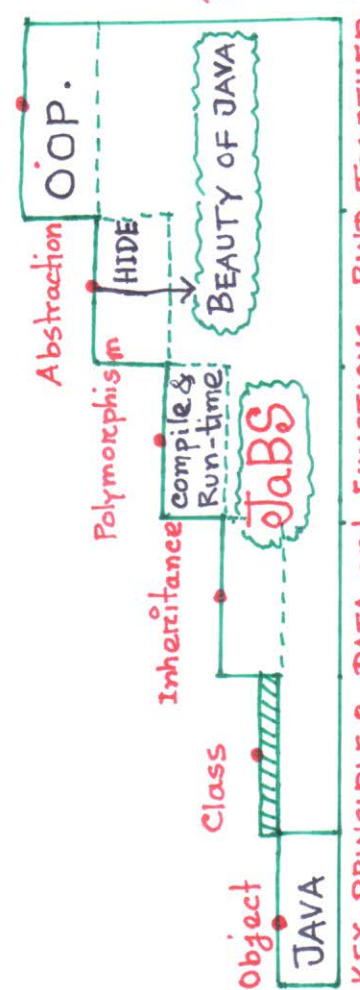
JAVA ORIGINALLY called Oak.
It became JAVA in 1995

JAMES GOSLING
Computer Scientist
SUN microsystem
CANADA.

Encapsulation

Figure: JaBS

Acronym given by (DHMAI)



KEY PRINCIPLES: DATA and FUNCTIONS BIND TOGETHER

5 keys and 4 (Four) Apartments (JVM) (JAVA)

(WRITE ONCE, RUN ANYWHERE)

[This means a programmer can develop JAVA code in one system, can expect to run on Any other system.]

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(DHMAI)
Assistant Professor, EWU, BD
Specialist on System-on-Chip SW
Embedded System SW
Internet Protocol and
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```
import java.lang.*;  
import java.util.*;
```

Try Not to use "*" → "means import all. Import that you need!"

That you need!"

JaBS sheet

```
public class JavaMostConceptInOneProgramDhmai  
{
```

Function
overloading
↓
Same Name
Different Param

```
    int number;  
    private int privateNumber;  
    private String nameStr;  
    /*...*/  
    public JavaMostConceptInOneProgramDhmai ( ) { system.out.println("default Constr"); }  
    /*...*/  
    public JavaMostConceptInOneProgramDhmai (int num, int pNumber, String ename)  
    {  
        number = num;  
        privateNumber = pNumber;  
        nameStr = ename;  
    }  
}
```

Simple thinking: Everything in Java → Just Set/Get

int number
set/get

```
    public void setNumber (int sNumber) { number = sNumber; } // public void setNumber(...);  
    public int getNumber ( ) { return number; } // Get number  
    /*...*/  
    public void setName (String name) { nameStr = name; }  
    public String getNameStr ( ) { return nameStr; } // Get nameStr.  
    /*...*/  
    public void setPrivateNumber (int pNumber)  
    {  
        privateNumber = pNumber;  
    } // set privateNumber  
    /*...*/  
    public int getPrivateNumber ( ) { return privateNumber; }  
}
```

set/get
privateNumber

"A good Practice
In Programming
to Add Comments.
Comments can be
followed Doxygen
Format"

```
/*-----*/  
/* Multithreading has been discussed in a separate page */  
/* @copyright: East West University  
/* prepare by Dr. Hasan Mahmood Aminul Islam  
/* Assistant Professor, Dept. of CSE, EWU, Bangladesh  
/*  
/* setNumber(int); getNumber();  
/* setPrivateNumber(int); getPrivateNumber();  
/* setName(string); getNameStr();  
/*-----*/
```

```
public static void main (String[] args)  
{  
    JavaMostConceptInOneProgramDhmai objExample =  
        new JavaMostConceptInOneProgramDhmai ( );  
    objExample.setNumber (5);  
    // System.out.println ("check if properly set" + objExample.getNumber ());  
    System.out.println ("check if properly set" + objExample.getNumber ());  
}  
} // End of class JavaMostConceptInOneProgramDhmai
```

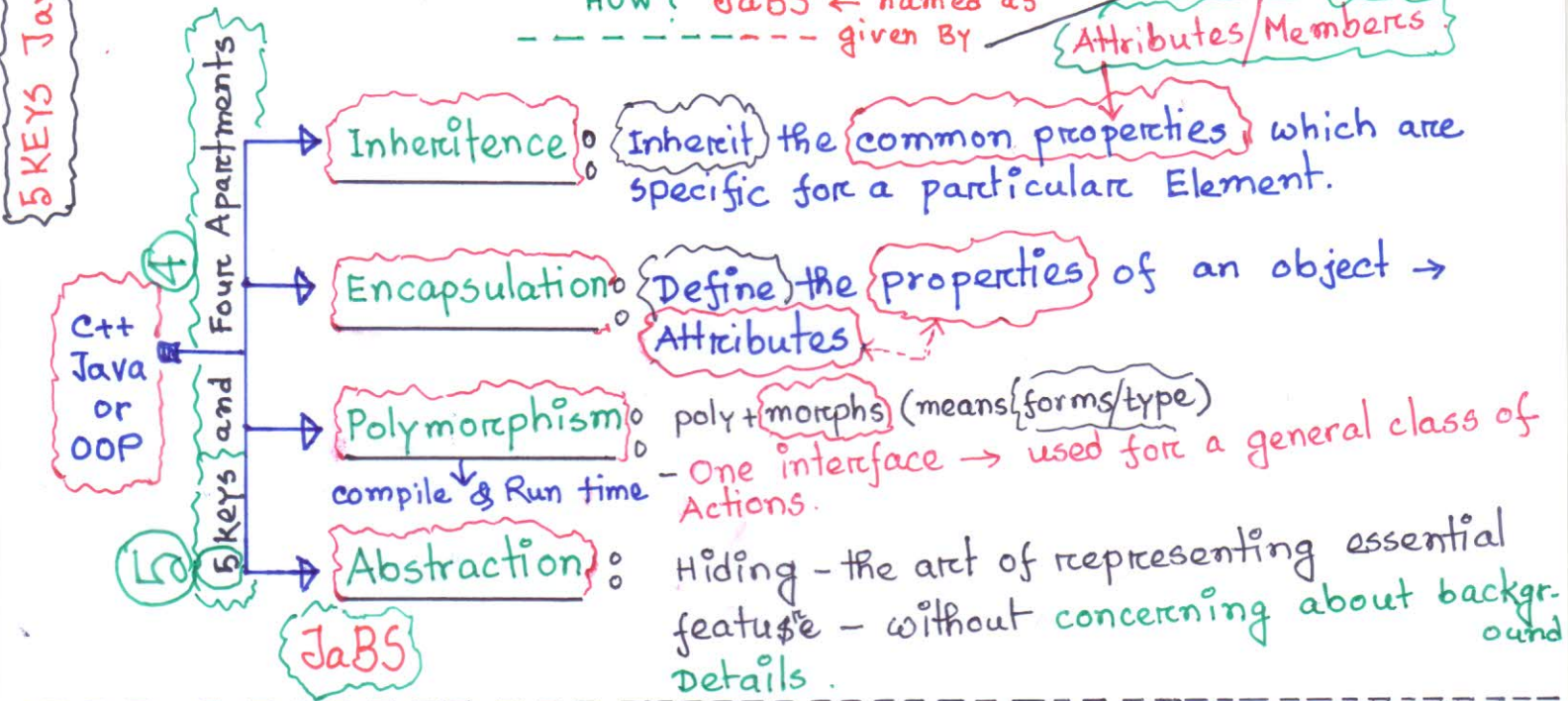

Java Building Stairs.

Object oriented Programming

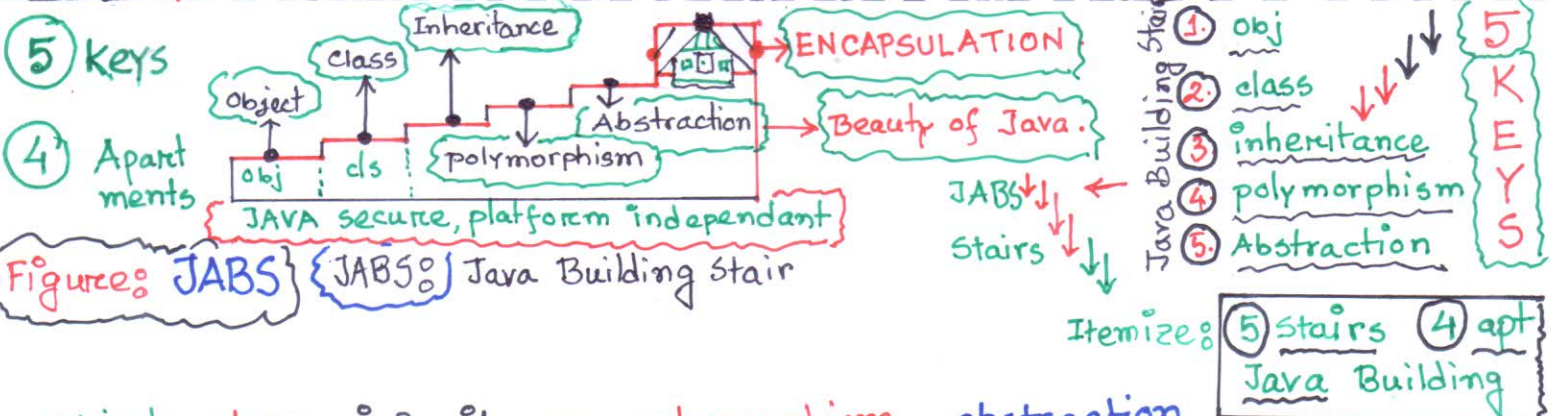
Key principle: DATA and Function's bind together.

HOW? JaBS ← named as given By

Attributes/Members



Java programs can execute in any environment ← JVM (Java Run-time System)



object class inheritance polymorphism abstraction

Inheritance - Encapsulation - Polymorphism - Abstraction

(JaBS) (JaBS) (JaBS) ← named/term as given by DHMAI

surgery of Dhmai Tax

Surgery of Dhmai Java prog

MAIN function/Method

START/Entry/ Gate/ Main gate of Java (JAB)

Then LINEWISE
in a seq. of Line Number

@copyright: EWU DHMAI

Java Code Segment

Handwritten Java code for a class named `DhmaiJava`. The code includes a constructor and a `main` method. Annotations explain the components:

- `public` is annotated as "public".
- `DhmaiJava` is annotated as "class name".
- `// constructor` is annotated as "same as Constructor".
- `public DhmaiJava()` is the constructor.
- `System.out.println(" Dhaka , BD");` is the statement inside the constructor.
- `// main` is the comment for the main method.
- `public static void` is the access modifier and return type.
- `main` is the method name, annotated as "main".
- `(String[] args)` is the parameter list.
- `DhmaiJava dhmai = new DhmaiJava();` is the instantiation line, where `dhmai` is annotated as "Obj/instance".

PART ONE (1)

PART TWO: EXAMPLE.

JAVA (MULTITHREADING)

What is Multithreading?

A small unit of a Java Application can EXECUTE IN PARALLEL.
(task)

* Beauty of Java { RUNS MULTIPLE Applications
in PARALLEL.

RECAP: A simple program runs in sequence and the code statements execute one-by-one.

NOTE: LATER IN YOUR B.Sc Program in EWU, some courses e.g., Operating System, will strengthen your knowledge about Threads and Processes in many application.
Real Life Example: Online Chats, Multi-player CHESS GAME.

"JABS" :-
• MULTITHREADING
VS
• MULTIPROCESSING

[When we talk about multithreading we don't care about core whether if the machine has a 2-core processor or 16-core processor.]

JAVA Supports for MULTITHREADING - HOW? "Thread" class

What we can do in JAVA?

- We can create MULTIPLE threads in our program and start the threads.
- JAVA RUNTIME will take care of creating machine-level instructions and work within Operating System (OS) to execute them in PARALLEL.

Two DIFFERENT types of Threads —
→ USER Thread → when we start an application, the main is the 1st user thread created.
→ DAEMON Thread same as USER Thread.

N.B. → WHEN ALL USER Threads ARE Executed,
JVM tears down/terminates the program.

