



Fundamentals of Object Oriented Programming

CSN- 103

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```
import java.util.Scanner;
class AddNumbers
{
    public static void main(String args[])
    {
        int a, b, c;
        System.out.println("Enter two integers to calculate
        their sum ");
        Scanner in = new Scanner(System.in);
        //System.in as InputStream
        a = in.nextInt();
        b = in.nextInt();
        c = a + b;
        System.out.println("Sum of entered integers = "+c);
    }
}
```

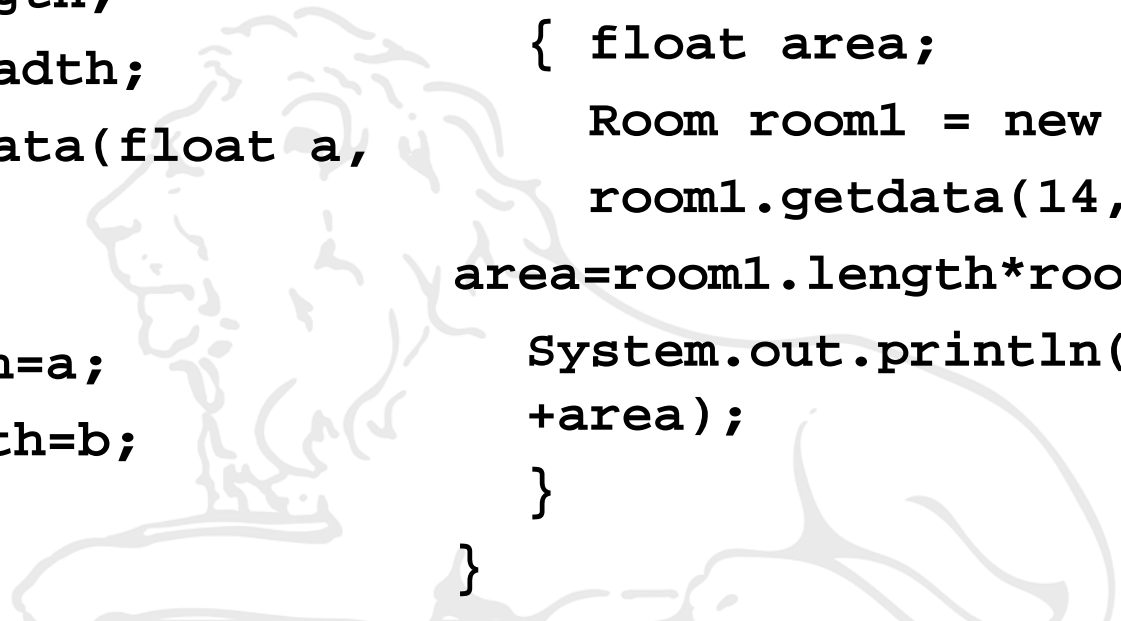
Handwritten annotations:

- object* (with arrow pointing to `Scanner in`)
- class* (with arrow pointing to `Scanner`)
- cin >> a;*
- cin >> b;*
- C++* (with bracket under the two lines above)
- input a*
- input b*
- Pseudo code* (with bracket under the two lines above)

An Application with Two Classes

```
class Room{
    float length;
    float breadth;
    void getdata(float a,
float b)
    {
        length=a;
        breadth=b;
    }
}

class RoomArea{
    public static void
    main(String args [ ])
    { float area;
        Room room1 = new Room();
        room1.getdata(14,10);
        area=room1.length*room1.breadth;
        System.out.println("Area=",
+area);
    }
}
```

A faint, light gray illustration of a lion statue, likely the Ashoka Lion Capital, is visible in the background of the code block.



Java Program Structure

// Finding Factorial

/ HelloWorld */*

// Add Num

Documentation Section	←	Suggested
Package Statement	←	Optional
Import Statements	←	Optional
Interface Statements	←	Optional
Class Definition	←	Optional
Main Method Class { Main Method Definition }	←	Essential

How Java differs from C

```
int a;  
cout << &a;
```



- Java does not include keywords **sizeof** and **typedef**
- Java does not contain the data types **struct** and **union**
- Java does not define the type modifiers keywords **auto**, **extern**, **register**, **signed** and **unsigned**
- Java does not support an explicit pointers
- Java does not have a preprocessor and therefore we can not use **#define**, **#include**, and **#ifdef** statements



How Java differs from C++

- Java does not support operator overloading
- Java does not have Template class
- Java does not support multiple inheritance of classes. This is accomplished using a new feature called “Interface”
- Java does not support global variables. Every variable and method is declared within a class and forms part of that class
- Java does not use pointers
- There are no header files in Java



Java and Internet

- Started with HotJava, a web browser to run applets on internet
- Websites with Java applet
- Java and WWW
- Web Browsers like HotJava, Netscape Navigator, Internet Explorer, Chrome....
 - HTML documents and `<APPLET>`



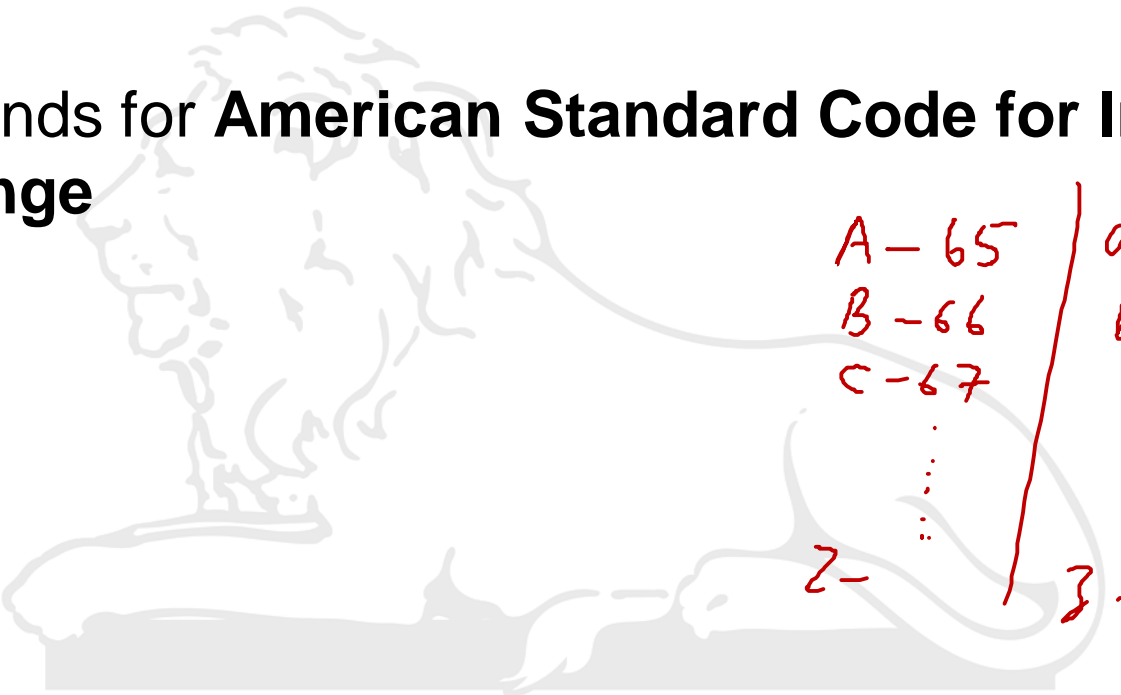
JAVA Tokens

- Reserved Keywords
- Identifiers
- Literals
- Operators
- Separators



Java Character Set

- ASCII character set in developing the programs
- ASCII stands for **American Standard Code for Information Interchange**



A-65	a-97
B-66	b-98
C-67	...
...	...
Z-	z-

</> source code

```
1  /* package whatever; // don't place package name! */
2
3  import java.util.*;
4  import java.lang.*;
5  import java.io.*;
6
7  /* Name of the class has to be "Main" only if the class is public. */
8  class Ideone
9  {
10     public static void main (String[] args) throws java.lang.Exception
11     {
12         char x; // char str;
13         x=66;
14         System.out.println(x);
15     }
16 }
```

input Output

Success #stdin #stdout 0.09s 27768KB

B

- <https://ideone.com/D0zYjL>



Keywords

Abstract	assert	boolean	break	byte
case	catch	char	class	const
continue	default	do	double	else
enum	extends	final	finally	float
for	goto	if	implements	import
instanceof	int	interface	long	native
new	package	private	protected	public
return	short	static	strictfp	super
switch	synchronized	this	throw	throws
Transient	try	void	volatile	while

Identifiers

A23 ✓

X 2factorial X



X 2java X

- Programmer-designed tokens
 - Classes, methods, variables, objects, labels, packages and interfaces
- Java identifiers follow the following rules
 - They can have alphabets, digits and the underscore and dollar sign characters
 - They must not begin with a digit
 - Uppercase and lower case letters are distinct
 - They can be of any length
- Name of all **public methods** and **instance variables** start with a leading lowercase letters
 - average
 - sum

→ ✓ Average ✓
A\$b ✓
A_B ✓

Identifiers

- When more than one words are used in a name
 - dayTemperature
 - firstDayOfMonth
 - totalMarks ✓
- All **private** and **local variables** use only lowercase letters combined with underscores
 - length
 - batch_strength
- All **classes** and **interfaces** start with a leading uppercase letter
 - Student
 - HelloJava
 - Vehicle
 - MotorCycle

total Marks X

Identifiers

- Variables that represent **Constant Values** use uppercase letters and underscores
 - TOTAL
 - F_MAX
 - PRINCIPAL_AMOUNT