

important terms from today's lecture in no particular order:

program	identifier	constant/named
application	block	constant
comment	statement	strongly typed
whitespace	parameter	language
indenting	reserved word	data type
block vs inline	case sensitive	primitive data type
comment	declaration	literal
class	assignment	String literal
method	int	

- **In the Java programming language:**
 - A program is made up of one or more *classes*
 - A class contains one or more *methods*
 - A method contains program *statements*

Java Program Structure

```
// comments about the class
public class MyProgram
{
}

```

The diagram illustrates the structure of a Java class. A red arrow points from the text "class header" to the line "public class MyProgram". A large red bracket on the left side of the code block spans from the opening curly brace to the closing curly brace, with the text "class body" positioned to its right. Below the closing curly brace, the text "Comments can be placed almost anywhere" is displayed.

Java Program Structure

```
// comments about the class
public class MyProgram
{
    // comments about the method
    public static void main (String[] args)
    {
    }
}
}
```

method body

method header

Notes

Basic program – heading – inline comments

Class – name begins with capital letter

Inline comments

Comment for overall program and the method

Every statement ends in a semi-colon.

Every statement in java has a particular syntax. See Appendix L for complete syntax.

```
//*****
//  Lincoln.java          Author: Lewis/Loftus
//
//  Demonstrates the basic structure of a Java application.
//*****

public class Lincoln
{
    //-----
    //  Prints a presidential quote.
    //-----
    public static void main (String[] args)
    {
        System.out.println ("A quote by Abraham Lincoln:");

        System.out.println ("Whatever you are, be a good one.");
    }
}
```

Second example is not formatted for readability

```
/**
 * Lincoln2.java      Author: Lewis/Loftus
 *
 * Demonstrates a poorly formatted, though valid, program.
 */
public class Lincoln2{public static void main(String[] args){
System.out.println("A quote by Abraham Lincoln:");
System.out.println("Whatever you are, be a good one.");}}
```

Third example incorporates our classroom style

```
/**-----  
//  
// Name: Lewis/Loftus  
// Date: 09/06/04  
// Assignment: PianoKeys.java  
//  
/**-----  
// PianoKeys class  
// Demonstrates the declaration, initialization, and use of an  
// integer variable.  
/**-----
```

Header to include the author's name, date and assignment. A description of the overall class. (If this were a programming test, the header would have been followed by the reference

```
public class PianoKeys  
{  
    /**-----  
    // Prints the number of keys on a piano.  
    /**-----*/  
    public static void main (String[] args)  
    {  
        int keys;    // keys will hold the number of piano keys  
        keys = 88;    // number of keys on a standard piano  
  
        System.out.println ("A piano has " + keys + " keys.");  
    }  
}
```

Class name is in Title case

- Main method is described using javadoc format.**
- method name, main, is in lower case.**
- keys is a descriptive variable name in lower case.**
- Declaration associates a memory location with a name and a length (type).**
- Declaration and initialization are separated into two statements.**
- Everything within the class block is indented three spaces. Everything within the main block is indented three additional spaces.**


Final example shows more complex program using successive assignment.

```
/**-----  
// Author: Lewis/Loftus  
// Date: 09/06/04  
// Assignment: Geometry.java  
/**-----  
// Demonstrates the use of an assignment statement to change the  
// value stored in a variable.  
/**-----
```

```
public class Geometry  
{  
    /**-----  
    // Prints the number of sides of several geometric shapes.  
    /**-----*/  
    public static void main (String[] args)  
    {  
        int sides; // stores number of sides for the shape  
  
        // Begin changing number of sides and printing shape.  
        sides = 7;  
        System.out.println ("A heptagon has " + sides + " sides.");  
  
        sides = 10;  
        System.out.println ("A decagon has " + sides + " sides.");  
  
        sides = 12;  
        System.out.println ("A dodecagon has " + sides + " sides.");  
    }  
}
```

- Declaration is separated from rest of the code.**
- Each assignment print group is separated by whitespace.**
- Program and main method are documented.**
- Inline comments describe the variable, sides, and the actions to be carried out.**

Named constants

```
//*****  
//  
// Name: Lewis/Loftus  
// Date: 09/06/04  
// Assignment: PianoKeys4.java  
//  
//*****  
// PianoKeys class  
// Demonstrates the declaration, initialization, and use of an  
// integer variable.  
//*****  
  
public class PianoKeys4  
{  
    /**-----  
    // Prints the number of keys on a piano.  
    //-----*/  
    public static void main (String[] args)  
    {  
        final int KEYS=88; 

|                                                                         |
|-------------------------------------------------------------------------|
| since a constant does not change we declare and initialize in same step |
|-------------------------------------------------------------------------|

  
        System.out.println ("A piano has " + KEYS + " keys.");  
    }  
}
```

Declare and initialize done as one step, only for CONSTANTS.

Note naming convention of constants. They may not appear to the left of an assignment after first value assigned.

Keyword “final” designates KEYS as a constant.

Data and data types

int is a data type (can also be called an abstract data type).

Used to hold integer values.

It is a primitive type – it is built into the language.

Java has 6 different numeric primitive data types.

int byte short long float double

See chart on page 74

Numeric representation of numbers means that the float numbers are approximation. Double has more precision than float.

Java has 2 other primitive data types.

char boolean

All variables must be declared before use.

Java is strongly typed. If you declare a variable of a particular type, you cannot use it to hold a value of a different type.