

<http://www.cs.columbia.edu/~sklar/cs1007>

today:

- news
- reading user input
- `java.lang` package
- `String` class
- type conversion
- command line arguments
- the `switch` branching statement
- loops
- reading: *ch 2.6 3.1-3.5*

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reading user input.

- note: the book uses something called the "Keyboard" class:
it is not part of the standard Java class library
- there are three kinds of interactive user input:
 - (1) command line input
 - (2) program prompted input
 - (3) event driven input

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the `java.lang` package.

- `java.lang.Object`:
the superclass for all Java classes, at the top of the hierarchy
- `java.lang.Boolean`,
`java.lang.Character`,
`java.lang.Byte`,
`java.lang.Short`,
`java.lang.Integer`,
`java.lang.Long`,
`java.lang.Float`,
`java.lang.Double`:
wrappers around primitive data types; define limits and contain conversion methods
- `java.lang.String`
- `java.lang.Math`

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news.

recitation sign-up today!!!

- packet circulating
- sign up for ONE recitation
- your homework will be returned to you at the recitation for which you sign up!

If you miss class, sign up in the CS dept office (450 Mudd).

Ask Alice at the front desk for the sign-up sheet.

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some definitions.

- object — variables are either:
 - (1) primitive data type (e.g., `int`, `char`, etc)
 - (2) Java *object*
- class — the formal definition of an object, can contain:
 - (1) variables and constants
 - (2) constructors
 - (3) methods
- class library — set of classes that support programming, usually grouped by similar purpose
- package — way of grouping classes within a library
- API — Application Programmer Interface
- Java is organized hierarchically

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`java.lang.Integer` class.

- a *constructor*:
`public Integer( int value );`
- some *constants*:
`public static final int MIN_VALUE`
`public static final int MAX_VALUE`
- some *methods*:
`public int intValue();`
`public static String toString( int i );`
`public static Integer valueOf( String s );`

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java.lang.String class.

- some constructors:
public String(); public String(String value);
- some methods:
public static String valueOf(int i);
public int charAt(int index);
public int compareTo(String anotherString);

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command line arguments.

```
import java.lang.*;
public class ex1 {
    public static void main ( String[] args ) {
        Integer tmp;
        int i;
        System.out.println( "number of args = " + args.length );
        System.out.println( "first arg = " + args[0] );
        System.out.println( "second arg = " + args[1] );
        tmp = Integer.valueOf( args[0] ); // String -> Integer
        i = tmp.intValue(); // Integer -> int
        // now we're ready to do some Math!
    } // end of main
} // end of class ex1
```

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the switch branching statement .

```
import java.lang.*;
public class ex3 {
    public static void main ( String[] args ) {
        String s;
        char c;
        System.out.println( "number of args = " + args.length );
        System.out.println( "first arg = " + args[0] );
        s = new String( args[0] ); // constructor
        c = s.charAt( 0 );
        System.out.println( "c = "+c );
        switch( c ) {
            case '0':
                System.out.println( "c is a digit" );
                break;
            case '1':
                System.out.println( "c is a digit" );
                break;
            case 'A':
                System.out.println( "c is a letter" );
                break;
            default:
                System.out.println( "c is undefined" );
        } // end of switch
    } // end of main
} // end of class ex3
```

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java.lang.Math class.

- some constants:
public static final double E
public static final double PI
- some methods:
public static int abs(int a);
public static native double sin(double a);
public static native double cos(double a);
public static native double tan(double a);
public static native double pow(double a, double b);
public static native double sqrt(double a);

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the if branching statement.

```
import java.lang.*;
public class ex2 {
    public static void main ( String[] args ) {
        String s;
        char c;
        System.out.println( "number of args = " + args.length );
        System.out.println( "first arg = " + args[0] );
        s = new String( args[0] ); // constructor
        c = s.charAt( 0 );
        System.out.println( "c = "+c );
        if ( c == '0' ) {
            System.out.println( "c is a digit" );
        }
        else if ( c == '1' ) {
            System.out.println( "c is a digit" );
        }
        else if ( c == 'A' ) {
            System.out.println( "c is a letter" );
        }
        else {
            System.out.println( "c is undefined" );
        }
    } // end of main
} // end of class ex2
```

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if with compound statements .

```
import java.lang.*;
public class ex4 {
    public static void main ( String[] args ) {
        String s;
        char c;
        System.out.println( "number of args = " + args.length );
        System.out.println( "first arg = " + args[0] );
        s = new String( args[0] ); // constructor
        c = s.charAt( 0 );
        System.out.println( "c = "+c );
        if ( ( c == '0' ) || ( c == '1' ) ) {
            System.out.println( "c is a digit" );
        }
        else if ( ( c == 'A' ) || ( c == 'B' ) ) {
            System.out.println( "c is a letter" );
        }
        else {
            System.out.println( "c is undefined" );
        }
    } // end of main
} // end of class ex4
```

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compound switch.

```
import java.lang.*;
public class ex5 {
    public static void main ( String[] args ) {
        String s;
        char c;
        System.out.println( "number of args = " + args.length );
        System.out.println( "first arg = " + args[0] );
        s = new String( args[0] ); // constructor
        c = s.charAt( 0 );
        System.out.println( "c = "+c );
        switch( c ) {
            case '0':
            case '1':
                System.out.println( "c is a digit" );
                break;
            case 'A':
                System.out.println( "c is a letter" );
                break;
            default:
                System.out.println( "c is undefined" );
        } // end of switch
    } // end of main
} // end of class ex5
```

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looping.

- if you want to do something many times
- two types of loops:
 - counter controlled
 - condition controlled
- three loop statements:
 - for
 - while
 - do

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for loop.

```
import java.lang.*;
public class ex6 {
    public static void main ( String[] args ) {
        Integer tmp;
        int n, i;
        tmp = Integer.valueOf( args[0] ); // String -> Integer
        n = tmp.intValue(); // Integer -> int
        System.out.println( "counting up to " + n + "..." );
        for ( i=0; i<n; i++ ) {
            System.out.print( i+ " " );
        } // end for
        System.out.println();
    } // end of main
} // end of class ex6
```

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increment and decrement operators.

- increment: ++

i++;

is the same as:

i = i + 1;

- decrement: --

i--;

is the same as:

i = i - 1;

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