**Main Idea**

So far we’ve written methods, but every time we need to use the same method in a different program, we have to copy/paste it into our new program.

How can we improve that situation?

**JDK Classes**

The Java Development Kit (JDK) has many classes already defined

See [http://download.oracle.com/javase/7/docs/api/index.html](http://download.oracle.com/javase/6/docs/api/index.html).

This shows the Application Program’s Interface (api) for ALL classes in the JDK

Class names are written in CamelCase

**Creating our OWN classes**

Suppose the JDK doesn’t have a class I need?

Requirements:

*Example: Sorting Class*

We have three different sort methods we can use to sort our arrays. We can make a class to organize these methods and make them accessible to many programs.

UML Diagram:

How do I use insertionSort on my array named “grades”?

public class SortingGradesInt  
{  
 public static void main(String[] args)  
 {  
 Scanner myScan = new Scanner(System.in); //for user input  
 System.out.print("How many grades would you like to enter?");  
 final int NUM = myScan.nextInt(); //number of grades to input  
 int [] grades = new int[NUM]; //initialize the array to hold the grades  
   
 readInValues(grades, myScan);  
 outputValues(grades, myScan);  
 // call the method in SorterInt class to sort the array  
   
   
 outputValues(grades, myScan);  
 }  
 public static void readInValues(int[] array, Scanner scan)  
 {  
 for(int i=0; i<array.length; i++)  
 {  
 System.out.print("Enter the value to put the array: ");  
 array[i] = scan.nextDouble();  
 }  
 }  
 public static void outputValues(int[] array, Scanner scan)  
 {  
 for(int i=0; i<array.length; i++)  
 System.out.println(array[i]);  
 }  
}

|  |
| --- |
| SorterInt |
|  |
| + static selectionSort(array:int[ ], num:int): void  - static indexOfLargestElement(array:int[ ], size:int): int  + static bubbleSort(array:int[ ], num:int): void  + static insertionSort(array:int[ ], num:int): void |

|  |
| --- |
| SortingGradesInt |
|  |
| + static readInValues(array:int[ ], scan:Scanner): void  + static outputValues(array:int[ ]): void  + static main(args:String[ ]): void |

*Example: Value Reading Class*

From Lab 6 we can generalize our dimension method to read in a value until the user enters a double:

public static double readDouble(Scanner scan)

{

//Keep trying until they get it right

while(!scan.hasNextDouble())

{

String garbage = scan.nextLine();

System.out.println(“Please enter the value as a real number”);

}

//They finally entered a number! Read it in and return it

return scan.nextDouble();

}

Could this method be useful in other programs too?

Are there other related methods that might make sense to group with this one?

UML Diagram:

Could we use this class in our example on the prior page?

**How do we use this new class in another class?**

public class PaintingArea

{

public static void main(String[] args)

{

announce();

Scanner userinput = new Scanner(System.in);

System.out.print(“Please enter the height of the room you’d like to paint in feet: ”);

double height =

System.out.print(“Please enter the width of a wall in the room: ”);

double width =

System.out.print(“Please enter the length of a wall in the room: ”);

double length =

double area\_to\_paint =

System.out.println(“You will need to paint “ + area\_to\_paint + “ feet of walls”);

}

private static void announce()

{

System.out.println(“This program determines the area of a room for painting”);

}

private static double calculateArea(double w, double h, double l)

{

return width \* height \* length;

}

}

|  |
| --- |
| PaintingArea |
|  |
|  |

|  |
| --- |
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