



CS 113 – Computer Science I

Lecture 07 – I/O (Input, Output, & Drawing)

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09/22/2022

Announcements

- Assignment 02
 - Due tonight - Thursday 09/22
- No Lecture next Tuesday (09/27):
 - watch the recording from Section 1's Monday (09/26)
- Office hours:
 - Adam's: 10:30-11:30am on Wednesdays



Agenda

- Announcements
- Arrays:
 - 2-dimensional
- I/O – Section 1.5 of textbook
 - Command line args
 - Input
 - Output
 - Drawing

2D Arrays

`int [] vals:`

defines an array of integers

We can also have an array of arrays!

```
int[ ][ ] vals = new int[8][10];  
                [rows][columns]
```

Command line arguments (revisited)

```
public static void main(String[] args)
```

Command line arguments are an *array of String*

Exercise: Write a program called `commandLineArgs.java` that prints out all the command line arguments that are passed in.

```
class CommandLineArgs {
```

Run | Debug

```
    public static void main(String[] args) {  
        for (int i = 0; i < args.length; i++) {  
            System.out.println(args[i]);  
        }  
    }  
}
```

Redirection – Output

We can save the console output of a program to a file

```
java compiled_java_class > file
```

Redirection - Input

We can load console input into a program from a file

```
java compiled_java_class < file
```


StdDraw: Basics

public class StdDraw *(basic control commands)*

void setCanvasSize(int w, int h)	<i>create canvas in screen window of width w and height h (in pixels)</i>
void setXscale(double x0, double x1)	<i>reset x-scale to (x0, x1)</i>
void setYscale(double y0, double y1)	<i>reset y-scale to (y0, y1)</i>
void setPenRadius(double radius)	<i>set pen radius to radius</i>

public class StdDraw *(basic drawing commands)*

void line(double x0, double y0, double x1, double y1)
void point(double x, double y)

StdDraw: coordinate systems

Draw on a canvas

Canvas has a height (y) and width (x)

Drawing a line: specify the coordinates of the beginning and end of the line

Drawing a circle: give x, y coordinates of center, and the radius

Origin is the bottom left of the circle: (0, 0)

Top right is (1, 1)

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public class StdDraw *(basic drawing commands)*

void line(double x0, double y0, double x1, double y1)
void point(double x, double y)

StdDraw: Shapes

```
public class StdDraw (shapes)
```

```
void circle(double x, double y, double radius)
```

```
void filledCircle(double x, double y, double radius)
```

```
void square(double x, double y, double r)
```

```
void filledSquare(double x, double y, double r)
```

```
void rectangle(double x, double y, double r1, double r2)
```

```
void filledRectangle(double x, double y, double r1, double r2)
```

```
void polygon(double[] x, double[] y)
```

```
void filledPolygon(double[] x, double[] y)
```

StdDraw: Draw a face!

More Applications

Animations

StdAudio

More File IO (Using intro-cs library)

Redirection (< or >) feeds input or output between a program and file

We can also read & write files using Java code

```
In reader = new In(filename)
```

```
Out writer = new Out(filename)
```

Filenames are location with respect to the program location

I/O Summary

Methods of input:

- Command line arguments
- Console input
- Redirection from command line (<)
- Open and read a file, `In reader = new In(filename)`

Methods of program output

- Console output
- Redirection from command line (>)
- Open and write to a file, `Out writer = new Out(filename)`