CS 113 – Computer Science I

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

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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 or arrays!

int [ ][ ] vals = new int[8][10];
    [rows][columns]
Command line arguments (revisited)

```java
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 {
    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) create canvas in screen window of width w and height h (in pixels)
- void setXscale(double x0, double x1) reset x-scale to (x0, x1)
- void setYscale(double y0, double y1) reset y-scale to (y0, y1)
- void setPenRadius(double radius) set pen radius to radius

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)
StdDraw: Basics

public class StdDraw (basic control commands)

void setCanvasSize(int w, int h) create canvas in screen window of width w and height h (in pixels)
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void setPenRadius(double radius) set pen radius to radius

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:

```java
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)`