

Let's Practice

Introduction
to
Programming

Laura Hobbes
LeGault

Review

Quickly:
Pretty Code

User Input

Other Variable
Types

Totally
Random!

Task: Write a program to calculate and output the surface area of paper in a ream of printer paper.

Relevant numbers:

- 1 paper dimensions: 8"x11"
- 2 number of sheets of paper in a ream: 500

Things to use: variables, constants

Using methods as expressions

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Recall: Expressions have two parts: *operators* and *operands*.

- 1 Math operators: $+$, $-$, $\times$, $\div$ become $+$, $-$, $*$, $/$
- 2 Integer division: $1/3 = ?$
- 3 Modulo: $5\%3 = ?$
- 4 Increment/decrement: $x++$; or $x--$;
- 5 Compound assignment: $x = x+1$ becomes $x += 1$

What about more complex operations, like powers or roots?

- 1 5^2 becomes `Math.pow(5,2)`
- 2 $\sqrt{25}$ becomes `Math.sqrt(25)`

Making Code Readable: Comments

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Adding comments makes code easier to read:

```
/* variable declarations */
```

```
int l = 8; // length
```

```
int w = 11; // width
```

```
/* calculate area */
```

```
int a = l*w;
```

```
System.out.println("Area = " + a);
```

The compiler ignores these; they're just for the programmer.

Making Variables Variable

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We can do output *to* the user, how about input *from* the user?
Before your class declaration, include a new line:

```
import java.util.Scanner;
```

Inside your code, declare a new Scanner so you can use it:

```
Scanner in = new Scanner(System.in);
```

Using Scanner

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To read in an integer:

```
Scanner in = new Scanner(System.in);  
System.out.print("Enter an integer: "); // why?  
int x = in.nextInt();
```

To read in a double:

```
Scanner in = new Scanner(System.in);  
System.out.print("Enter a double: "); // why?  
double y = in.nextDouble();
```

Strings and characters

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String literal: `"string"`

char literal: `'c'`

Empty String: `"`

Adding Strings together: `"Hello, "+" world!"`

String operations

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With Scanner:

Getting a char: `in.next()`;

Getting a String: `in.nextLine()`;

Using String methods:

To get a particular character: `s.charAt(ind)`;

To get a substring: `s.substring(beg,end)`;

To find the length: `s.length()`;

Note: 0-based indexing!

Random Number Generators

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In Java: Random class

⇒ Must include line `import java.util.Random;`

To declare: `Random rng = new Random();`

To get a number: `int rand = rng.nextInt(range);`

MOAR Practice

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With a partner: write a dice rolling program!

- 1 Prompt user for number of sides on the die
- 2 Get user input
- 3 Generate random number as a roll
- 4 Output result