Practice for Midterm 1
Practice problems

- These slides have six programming problems for in-class practice
- There are an additional seven programming problems for take-home practice
- The midterm will have four problems of similar difficulty
- A JavaFacts summary is posted on the course web page, and will be available during the midterm
Other problems

- The midterm will also have a number of t/f, multiple choice or short answer questions
- The programming problems will count for the majority of points on the exam
Key points

• How to create and initialize a variable
• How to call a method on an object
• How to design or evaluate an expression
• How to make decisions using *if* and *if/else* statements
In each programming problem, you are given a code framework similar to the following. Solve the problem by filling in the necessary statements in place of ‘..’. You may assume that the necessary ‘import’s have been made.

```java
public class ProblemX{
    public static void main(String[] args) {
        ..
    }
}
```
Input three integers from a user (call them $a$, $b$, $c$). You may assume that the user input will be correct.

Output the message that correctly describes the numbers:

- "Three negative"
- "Two negative and one non-negative"
- "One negative and two non-negative"
- "Three non-negative"
Practice 2

• **Input:** You are given a Rectangle r.

```java
public class ProblemX{
    public static void main(String[] args) {
        Rectangle r;
        r.setValues();
        ..
    }
}
```
Practice 2

• **Do:**
  – Determine the dimensions of r.
  – If the height and width are not equal, set the larger one equal to the smaller one.

• *Output: "r is a n by n square", where "n" is the actual height and width of r.*
Rectangle Methods

- void setValues()
- int getWidth()
- int getHeight()
- void setWidth(int newWidth)
- void setHeight(int newHeight)
Practice 3

• The statement `Math.random()` generates a random double greater than or equal to 0.0 and less than 1.0.

• *Input:* Use this statement to generate a roll of two dice (call them $a$ and $b$).

• *Output:*
  – Print out the values of the two dice.
  – If they sum to 2, 3 or 12, print out "Craps. You lose."
  – If they sum to 7 or 11, print out, "You win."
  – Otherwise, print out, "Roll again."
Practice 4

• The statement `Math.random()` generates a random double greater than or equal to 0.0 and less than 1.0.

• *Input:* Use this statement to generate four random numbers in the range 0-99. Call them $a$, $b$, $c$, $d$.

• *Output:*
  - Print out the four numbers generated.
  - Print out, "The largest is" and then the largest of the four numbers.
Practice 5

• *Input* three strings from the user. Call them s1, s2 and s3.

• *Output*: Print out the three strings ordered by length, shortest first. If two strings are of equal length, their order doesn't matter.
Practice 6

• *Input* a string from the user.

• *Output*:
  – If the string is empty, print out, "Non empty string, please."
  – Otherwise, if the first character is an upper or lower case letter or underscore, print out, "Legal identifier."
  – Otherwise, print out, "Illegal identifier."
Take home practice 1

• **Input** three integers from a user (call them \(a, b, c\)). (You may assume that the user input will be correct.)

• **Output** the message that correctly describes the numbers:
  – "Three even"
  – "Two even and one odd"
  – "One even and two odd"
  – "Three odd"
Take home practice 2

- **Input:** You are given a Rectangle r.
- **Output:**
  - If the width of r is greater than the height, print out, "Landscape."
  - If the height of r is greater than the width, print out, "Portrait."
  - If the height and width of r are equal, print out, "Square."
Take home practice 3

• The statement `Math.random()` generates a random double greater than or equal to 0.0 and less than 1.0.

• Input: Use this statement to generates a random lower case letter of the alphabet.

• Output:
  – Print out the letter generated.
  – If the letter is 'a', 'e', 'i', 'o' or 'u', print out, "Vowel."
  – Otherwise, print out, "Not a vowel."
Take home practice 4

- **Input** three strings from the user. Call them s1, s2 and s3.
- **Output**: Print them out in lexicographic (dictionary) order.
Take home practice 5

• *Input* a string from the user.
• *Output*:
  – If the string is empty, print out, "Non empty string, please."
  – Otherwise, if the first character is a digit, print out, "Starts with digit."
  – If the first character is a lower case letter, print out, "Starts with lower case letter."
  – If the first character is an upper case letter, print out, "Starts with upper case letter."
  – Otherwise, print out, "Starts with non-alphanumeric."
Take home practice 6

• *Input* a string from the user.
• *Output:*
  – Print out the string.
  – If the string (ignoring case) is 'yes', print out “Affirmative.”
  – Otherwise, print out, "Not affirmative."
Take home practice 7

- **Input** two strings from the user; call them s1 and s2.
- **Output:**
  - If either is less than two characters in length, print out, "Too short."
  - Otherwise, if the first two characters of each is the same, print out, "Same prefix".
  - If the last two characters of each is the same, print out, "Same suffix." Note that the prefix and suffix of a string may overlap.