Welcome to ICS 111 Lab

Section 3 and 4

Week 4

****Read through HW3 Assignment****

Tuesday Outline

- Lab 2 Review (Breakout groups)
- Conditional Statements(If Else, Switch)
- Program Design (Breakout groups)
- HW 3 NOTE: No calculation in part D

Lab 2: Review (Breakout Groups)

- How did the lab go for you?
- What did you find challenging?
- What errors or issues did you encounter and how did you resolve them?

Conditional Statements: If-Else

- Conditional statements are a way for your program to make decisions.
- Condition is defined and contained in parentheses and will evaluate to TRUE or FALSE.

```
if (condition)
{
    // Executes this block if
    // condition is true
}
else
{
    // Executes this block if
    // condition is false
}
```

Conditional Statements: If- Else

Syntax 3.1 if Statement

Syntax

```
if (condition)
{
   statements
}
```

```
if (condition) { statements1 }
else { statements2 }
```

A condition that is true or false.
Often uses relational operators:
== != < <= > >= (See page 89.)

Braces are not required if the branch contains a single statement, but it's good to always use them. See page 86.

```
if (floor > 13)
{
   actualFloor = floor - 1;
}
else
{
   actualFloor = floor;
}
```

Don't put a semicolon here! See page 86.

If the condition is true, the statement(s) in this branch are executed in sequence; if the condition is false, they are skipped.

Omit the `else` branch if there is nothing to do.

Lining up braces is a good idea. See page 86.

If the condition is false, the statement(s) in this branch are executed in sequence; if the condition is true, they are skipped.

Textbook:
p83

If-Else Logic Chart

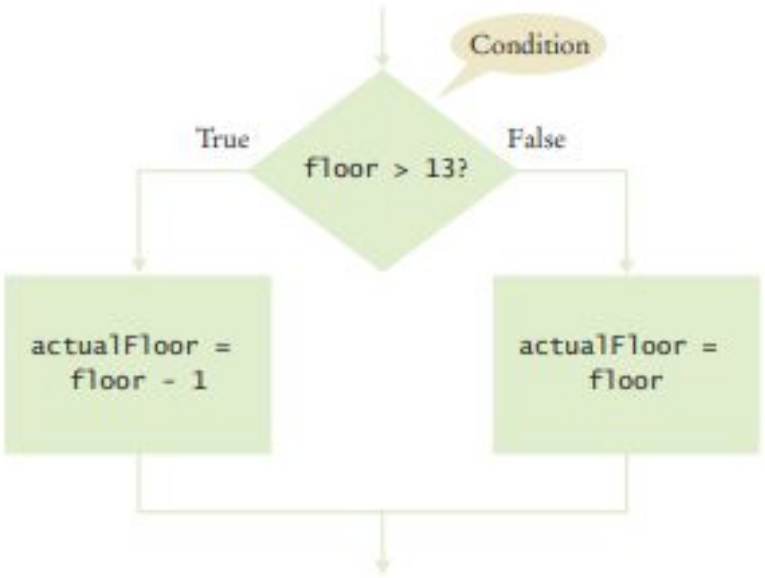


Figure 1
Flowchart for `if` Statement

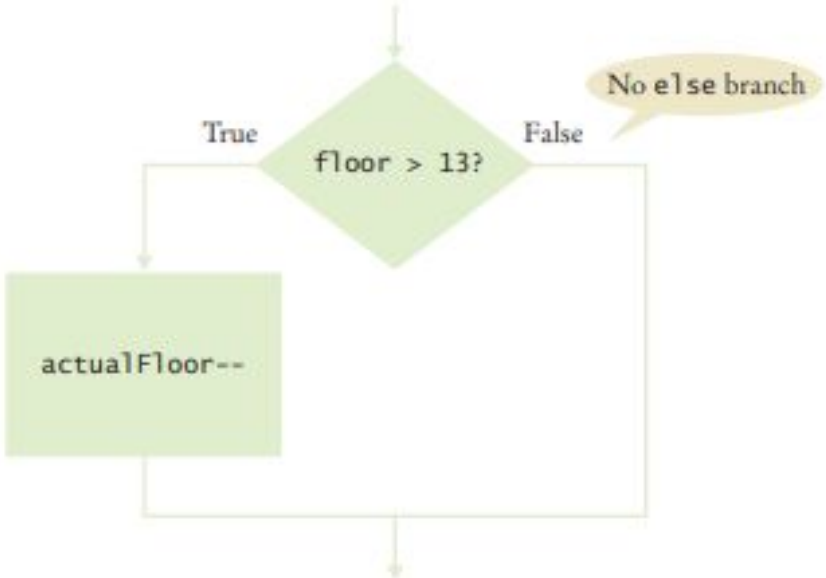


Figure 2
Flowchart for `if` Statement with No `else` Branch

Switch Statements in Java:

- The switch statement is a multi-way branch statement. It provides an easy way to dispatch execution to different parts of code based on the value of the expression.

- Source: https://www.geeksforgeeks.org/switch-statement-in-java/

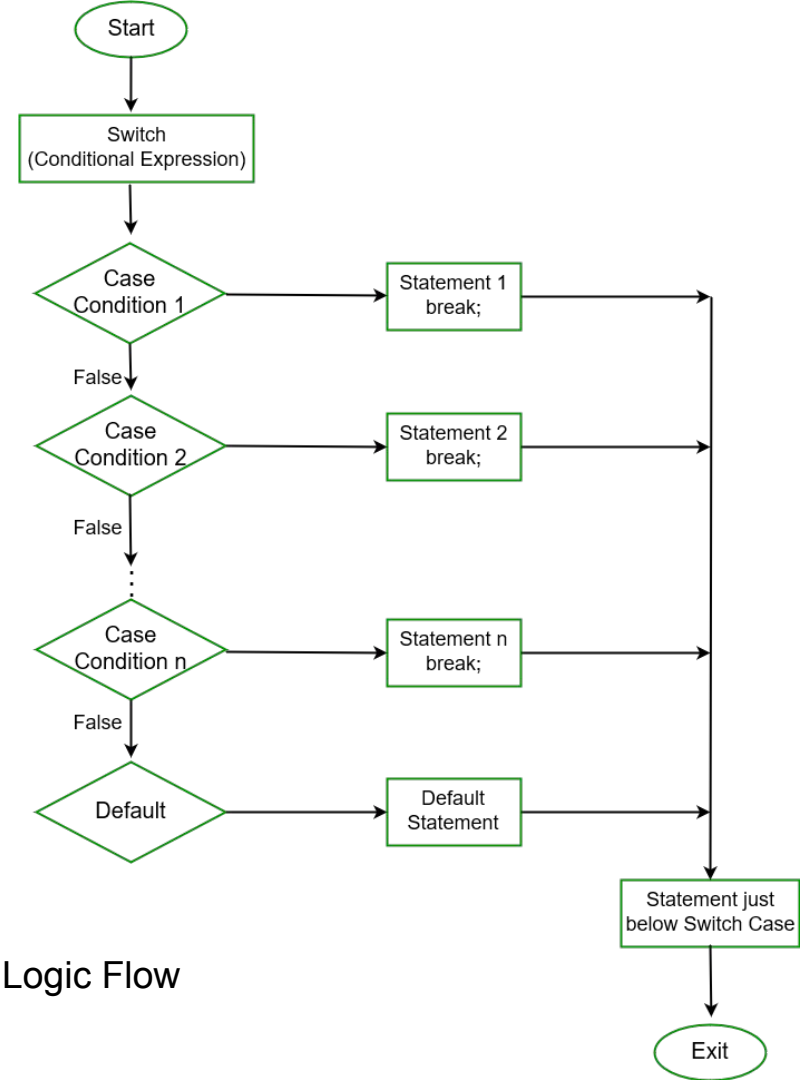
Switch Statements: Syntax

```
// switch statement
switch(expression)
{
   // case statements
   // values must be of same type of expression
   case value1 :
      // Statements
      break; // break is optional

   case value2 :
      // Statements
      break; // break is optional

   // We can have any number of case statements
   // below is default statement, used when none of the cases is true.
   // No break is needed in the default case.
   default :
      // Statements
}
```

Switch Statements:

```
//Switch Statement Example (G4G)

int month = 4;
String monthString = null;

switch(month) {

  case 1: monthString = "January";
          break;
  case 2: monthString = "February";
          break;
  case 3: monthString = "March";
          break;
  case 4: monthString = "April";
          break;
}

System.out.printf("\n\n Month is %s", monthString);
```

Code Example



Logic Flow

Program Design/Outlining (Breakout Groups)

1. Identify overall goal of the program
2. Define program outputs
3. Outline program logic according to the assignment:
    - Identify libraries used (if any), define variables,conditional statements, special calculations, etc.
    - Write out the flow of the program [pseudo code]
4. Develop Unit Tests** (we are not doing this step)
5. Implement code

Part A:

- Write a program (PrintDistance.java) that reads a number of feet from the user, then prints out either the same number if the feet are less than **5280**, or otherwise the number of miles and feet.

  i.e. Enter the number of feet: 5290
  You entered: 1 mile 10 feet

- Your program must correctly print the miles and feet, correctly using the singular form (foot instead of feet, mile instead of miles) if there is just one mile or one foot.

- Your program should also check that the number of feet entered by the user is greater than 0. If the number is 0 or less, your program should print "Number out of range" instead of "You entered: ...".

Program Outputs:

Possible outputs:

- Feet
- Mile
- Miles
- Mile and Foot
- Mile and Feet
- Miles and Foot
- Miles and Feet
- Number out of range

Logic Outline: Part 1

Libraries: Scanner

Variables:

Type	Variable Name	Desc.
int	input	User input; from Scanner
int	miles	Miles calculation
int	feet	Feet calculation

Conditional Statements: if-else

Calculations:

-
```
miles = input / 5280;
feet = input % 5280;
```

Logic Outline: Part 1

Libraries: Scanner

Variables:

Type	Variable Name	Desc.
int	input	User input; from Scanner
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Conditional Statements: if-else

Calculations:

-
```
miles = input / 5280;
feet = input % 5280;
```

Modulo ‘%’: calculates the remainder

Logic Outline: Part 2- Pseudo Code

1. Print output to prompt user to enter number
2. IF user input is less than or equal to 0; print “Number Out of Range”
3. Otherwise (ELSE) IF the input is less than 5280; print “you entered…”
4. Otherwise(ELSE) calculate miles and feet and print “you entered …miles…feet”

Note: This is a draft; do not follow for actual assignment

Week 4: Resources

- HW 3: http://www2.hawaii.edu/~esb/2022spring.ics111/hw03.html
- Textbook PDF: http://bedford-computing.co.uk/learning/wp-content/uploads/2015/09/Java-for-Everyone-Late-Objects.pdf
- Switch Statements vs If- Else: https://www.geeksforgeeks.org/switch-vs-else/