

CSc 1350:Nesting If-then-else Statements

Supplementary Notes

- Nested If-then-else Statements

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Definition 1. A **nested if statement** is one that is defined within the scope of another *if* statement.

Example 1.

Listing 1: A Nested-if Code Segment

```
if (grade >= 60)
{
    if (grade < 70)
        System.out.println("Not interested in CS but I passed.");
    else
        System.out.println("I showed some interest in CS.");
}
```

When will ‘*I showed some interest in CS.*’ be printed? Note: In a nested if-then-else statement, the *else* pairs with the *if* closest to it, unless the order of execution is changed by inserting braces. The spacing and/or indentation does not determine the order of execution. However, indentation and spacing are used within code block to conform to programming standards and conventions and makes the code more readable. Which *if* does the *else* pair with in the example above? How would you add a *counter* variable to the code segment in Example 1 to count the number of comparisons made during the execution of the code segment?

Example 2.

Listing 2: A Nested-if Code Segment

```
if (grade >= 60)
{
    if (grade < 70)
        System.out.println("Not interested in CS but I passed.");
}
else
    System.out.println("I showed some interest in CS.");
```

When will ‘*I showed some interest in CS.*’ be printed? Example 2 is not functionally equivalent to Example 2. Observe where the braces are placed. Which *if* does the *else* pair with? How would you add a *counter* variable to the code segment in Example 2 to count the number of comparisons made during the execution of the code segment?

Example 3. List all pairs of values of *x* and *y* in the range $1, \dots, 10$ for which each name will be printed?

Listing 3: A Nested-if Code Segment

```
if (x >= 6)
{
    if (y < 3)
        System.out.println("Angelina Jolie");
    else
        System.out.println("Brad Pitt");
}
else
{
    if (y > 9)
        System.out.println("Jennifer Garner");
    else
        System.out.println("Ben Affleck");
}
```

How many comparisons are made when Brad Pitt is printed? What is the least and most number of comparisons made when this code is executed? Which name(s) are printed in each case? How would you add a *counter* variable to the code segment in Example 3 to count the number of comparisons made during the execution of the code segment?

Example 4.

Listing 4: A Nested-if Code Segment

```
if(examsavg > 80)
    if(attendance >= 30)
        if(pgmassgs > 20)
            System.out.println("Your grade is A.");
```

Why are braces not necessary? How would you add a *counter* variable to the code segment in Example 4 to count the number of comparisons made during the execution of the code segment?