What If:

An Introduction to Conditional Statements

- Conditional statements describe the behavior of the computer in response to various situations.

- A computer will respond differently to different commands. (Humans employ similar logic—if it's snowing outside, we wear a coat and boots; if it's sunny and warm, we wear a T-shirt.)

- The computer makes decisions based on what's happening in a program. However, since computers are not intelligent, they must be told exactly what to do in every situation.

- Think back to the sandwich activity . . .

- Say the cafeteria serves only sandwiches except on Fridays, when it serves both sandwiches and pizza. Since most students would rather eat pizza, the cafeteria should make fewer sandwiches on that day.

  - If it is not Friday, make 100 sandwiches

  - Else, if it is Friday, make 30 sandwiches

- How does a conditional statement change the sandwich-making computer 'program' you created?

a. Take a slice of bread

b. Open the jar of peanut butter by twisting the lid counter clockwise

c. Pick up a knife by the handle

d. Insert the knife into the jar of peanut butter

e. Pull the knife out of the jar of peanut butter and run it across the slice of bread

f. Set down the knife

g. Take a second slice of bread

h. Repeat steps a–f with the second slice of bread and the jar of jelly

i. Press the two slices of bread together such that the peanut butter and jelly meet

- *If it is not Friday, repeat steps a–i 99 more times*

- *Else, if today is Friday, repeat steps a–i 29 more times*

What if you want to make an apple pie? Your recipe calls for <u>exactly</u> 5 apples. You need to decide if you need to go to the grocery store to buy apples or not. Consider the following situations, and describe what you would do in each "what-if" situation:

- What if you have 1 apple? *Go to the grocery store to buy more apples*
- What if you have 5 apples? *Do not go to the grocery store*
- What if you have 8 apples? *Do not go to the grocery store.*
- *What if you have –3 apples: What? You must have made a mistake! Negative apples make no sense.*

Using language a computer could understand:

- **IF** you have less than 0 apples:
  - *then you have made a mistake and should count again*

- **ELSE IF** you have less than 5 apples (*AND the IF was not executed so you know you have at least 0 apples*):
  - *then buy more apples*

- **ELSE** (*If the above are false, you must have 5 or more apples*):
  - *then you don't need to buy more apples*

Rewrite this problem one more time, with the special C language format ("a" will represent the number of apples you have):

```
if (a < 0)
{
Count again
}
else if (a < 5)
{
Buy more apples
}
else
{
Don't buy more apples
}
```