Unit 6 Lesson 1A Syntax of Decision making

We make decision every day and in doing so frequently have to make a choice between two or more actions. Our decisions are influenced by one or more factors, depending on the conditions, limitations, circumstances which exist at the time of decision making.

For example:

```
if you are healthy, then
   you should go to school
otherwise you should stay home.
```

Computers cannot think (yet!) and make decision however the Arithmetic Logic Unit (ALU) can evaluate any expression which uses comparison for being True or False.
The syntax used in such cases is a specific structure called an ***IF*** statement.

Processing uses an if statement having a form similar to the conditional English statement shown above.

```
if (<boolean expression>)
  <statement1>
else
  <statement2>
```

Syntax:

- A decision making block must start with an ***IF***.
- A boolean expression needs to be constructed for evaluation by the ALU.
- The boolean expression **must** be surrounded by brackets, they are not optional.
- If the boolean expression is TRUE then $statement_1$ is executed
- Else is not mandatory but it makes the program more readable when and if the boolean expression is FALSE.
- In either case ***the outcome of an if structure is only one*** and only one statement is performed.

Example with code:

```
This program compares two temperatures in  integer format entered by the user and evaluates
which temperature is higher.
void setup()
{
Int temp1=0;
Int temp2=0;
  int temp1 = getInt("Please enter first temp");
  int temp2  = getInt("Please enter a second temp");
  if ( temp1>temp2)
    println("The  first temp is higher");
  else
    println("The second temperature is higher");
}
```

Compare the three code snippets below. Will their output be the same? Why or why not?

```
if (x > 0)
    println("x = " + x);
```

```
if (x > 0)
    println("x = " + x);
  else
    ;
```

```
if (x <= 0)
    ;
 else
   println("x = " + x);
```

Yes, I believe they will be the same. The first two have the same boolean expression, and while the second one has an "else", there's nothing in that section so there's no difference. While the third one may have a different boolean expression, there's nothing for it to do if it is that expression, and that expression covers everything other than what the previous statements covered. The "else" will do the same thing as the "if"s for the previous snippets, and covers the same values so yes, their outputs are all the same.

1. Write only Processing statements to perform each task. NO COMPUTER!

   a. Add one to the value of *zeroCoun*t if the variable *total* has the value zero.
   b. Add one to the value of ***pageCount*** if the variable ***lineCount*** is greater than ***pageLength***.
   c. Set the value of the boolean variable ***leftSide*** to true if the int variable ***pageNum*** is even, and to false if ***pageNum*** is odd.

A)
```
if (total == 0)
  zeroCount += 1;
else
```

B)
```
if (lineCount > pageLength)
  pageCount += 1;
else
```

C)
```
if (pageNum % 2 = 0)
  leftSide == true;
else
  leftSide == false;
```

Decisions Homework Assignment /20 T/A

Work with a partner. Write a complete Processing application for each of the following problems.

1. Write a Processing program which will compare the amount of time between your return home from school and bedtime with the number of hours you need for homework to determine if you will be able to go to bed on time. The message output should state if you need to stay late to finish your homework or go to bed on time. Name the program **Bedtime.pde**

2. Create a program which will assist any teenager in deciding whether to attend a school dance. *(Hint: consider all deciding factors such as ticket price, friends attending, theme of the dance etc).* Name the program **Dance.pde**

1. Each program must have the following methods – title(),introduction(),userInput(), display() and setup().
2. Save each program separately . Place all programs in one folder YourName_Conditionals1 and drop off.