Arduino Control Structures

Introduction

In any programming language, control structures are the constructs that determine how the computer moves through the code based on some kind of logic. They include things like loops, switches, and iff statements. In this section, we'll look at some of the more common structures used Arduino projects.

Loops

Loops are used to execute some line of code over and over again. Some loops, like the one that calls the function named loop, are infinite loops: they keep going forever (until we cut the power to the device). Other loops, continue execution until some logical condition is met, then they break out of the loop and code execution continues.

For Loop – This is a loop that is executed some predetermined number of times. The for loop contains an index which is incremented each time through the loop, showing you how many times you've been through the loop at any given point.

```
for (start; stop ; increment){
     //body
}
```

For instance, here is a loop that simply prints all the values from 0-100

```
for (int i = 0; i <= 100; i++){
     Serial.println(i);
}
```

While Loop – This is a loop that is executed as long as some logical expression remains true. You've already seen several instaces of these in the provided sketches.

```
while (condition) {
     //body
}
```

For instance, here is a code snippet that adds increases a variable named i by some random number between zero and ten until that number exceeds 100. Each time through the loop it prints out the value.

```
int i = 0;
while (i<100) {
     i += random(10)
     Serial.println(i);
}
```

If Statement – This is a structure that checks for a logical condition, and it its met, it executes the code inside the curly braces.

```
if (condition) {
     //body
}
```

For instance, here is a code snippet that checks if the value of a variable named i is greater than 50, if it is, it prints that the variable is greater than 50.

```
if (i > 50) {
     Serial.println(i + "greater than 50");
}
```

Else Statement – Follows an if statement and is executed in the event that the if statement is NOT executed.

```
else {
     //body
}
```

For instance, here is a snipped that prints an alternate statement to the event that i is less than 50.

```
else {
     Serial.println(i + "less than 50");
}
```