

TUTORIAL #3.04: do-while

Unit 3 Programming Structures

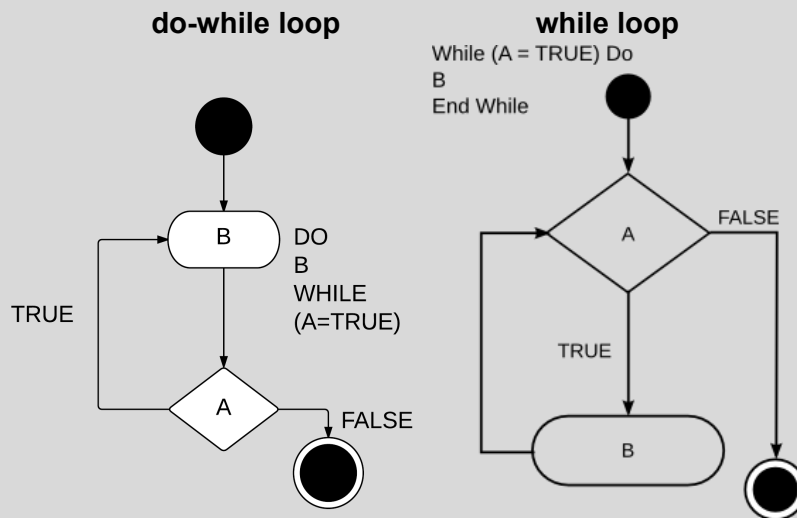
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DO-WHILE LOOPS

Unlike `for` and `while` loops, which test the loop condition at the top of the loop and only enter the loop if the condition is met, a **do-while** loop checks its condition at the bottom of the loop. Because the code in the loop runs **BEFORE** the conditional, they are guaranteed to execute at least one time.



Why use do-while?

If you want or need commands to execute at least once and then possibly repeat, a do-while loop might be for you! This is useful if you want to display a menu, or run code until a request to terminate, or start a component as “on” (outputting or sensing) until something changes.

Or, if you’re Wile E. Coyote, you probably should stick with a `while` loop:



STRUCTURE: do-while

```
do {  
  // statement block  
} while (condition);
```

Parameters

condition: a boolean expression that evaluates to true or false.

Example

The following example will print the values 0-99. It will NOT print 100 because after printing 99, x will increment, and then the program will determine that x is no longer < 100.

```
int x = 0;  
  
do {  
  Serial.println(x); // print variable x  
  x++;               // increment x  
} while (x < 100);    // exit the loop after x becomes 100
```

STARTER BUILD -- do-while Loops

Tutorial Code

Copy and paste this code into Arduino IDE and click VERIFY to compile (and save, if you want).

```
// Your Name  
// Your Robotics Course Section  
// Title (Name of Tutorial/Project)  
// Description: Restate the purpose of the program in your own words  
// Date Started - Date Completed  
  
void setup() {  
  Serial.begin(9600);  
}  
  
void loop() {  
  
  String destReached = "no";  
  
  do {  
    Serial.println("Are we there yet?");
```

```

while(!Serial.available()) {}
destReached = Serial.readString();
Serial.println(destReached);
} while (destReached == "no");

Serial.println("I'm so happy we're here!");
}

```

If you're not sure about a line of code or have a question, leave me a comment (either a private comment on the assignment OR highlight the line, CTRL+ALT+M and @ me).

Circuit Image

Build the circuit shown below using the components listed. You can do this in TinkerCad OR using a kit.

No circuit for this! But you still need to attach your Arduino (IRL or TinkerCad).

Build the circuit shown in the above diagram. You may do this in TinkerCAD OR using your Arduino kit.

Include a picture of your circuit that shows all connections. *You can attach the image to the assignment instead of pasting it in the document.*

***No circuit!** I'm leaving this space here so that next time I make a tutorial I don't have to add it back in.*

IF YOU ARE USING AN ARDUINO KIT

1. Copy/paste the starter code into the Arduino IDE.
2. Click **VERIFY** to compile the program and ensure there are no errors.
3. Save the program.
4. Connect the microcontroller of your circuit to your computer using the provided USB cable.
5. Make sure your board settings and COM port are correct.
6. Click **UPLOAD** to run the program.

IF YOU ARE USING TINKERCAD

1. Copy/paste the starter code into the Arduino IDE.
2. Click **VERIFY** to compile the program and ensure there are no errors.
3. Save the program.
4. In your TinkerCAD project, hit **Code**, select **Text**, and copy/paste your code into the scripting area.
5. Click **Start Simulation** to run the program.

Your serial monitor should repeatedly ask if we're there yet until the response isn't "no."

Challenge: Challenge Challenge

Revisit one of our previous tutorials (sample code OR challenges) and implement a do-while loop. **Your tutorial or project MUST include a minimum of 2 components (inputs or outputs).**

You may choose to additionally streamline the code using any functions or structures we have learned so far.

1. Copy & paste your modified code below (**with comments and header**).

2. Insert or attach an image of your circuit that clearly shows all connections.

3. **Attach a video of your working monitor to this assignment. (You can use your phone).** If you cannot attach a video, please include multiple images of your circuit in all possible states.

4. **EXPLAIN** why a do-while loop is useful specifically to the tutorial or challenge you chose.