

# Assignment Arduino 1: Volume Control

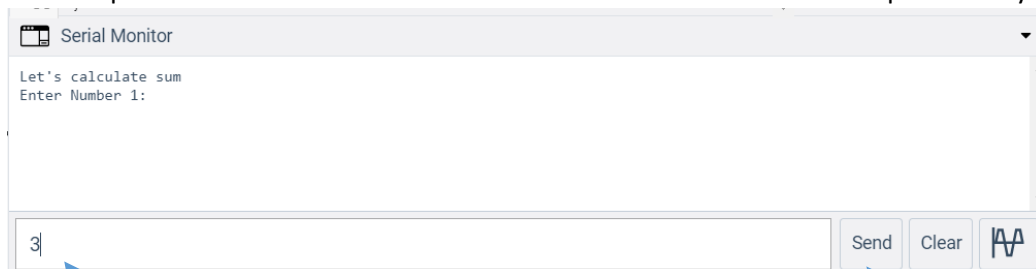
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## Part 1: Entering Data, Manipulate the Data, and Circuit Output

A. Copy the following code. Code will show how to use enter two numbers from the serial monitor.

```
1 float number1, number2, sum;
2
3 char junk = ' '; //Variable Used to erase Bad Input
4
5 void setup()
6 {
7   Serial.begin (9600); //Connects User to Serial Monitor for Input/Output on Screen
8
9   Serial.println ("lets calculate sum"); //Serial.println: Places text or variable value on screen
10  //The ln drops the cursor to the next line
11
12  Serial.flush(); //Wait for the Transmission of outgoing data to complete
13 }
14
15 void loop()
16 {
17   //Input Process for Input Number 1
18   Serial.println ("Enter Number 1: ");
19   while (Serial.available() == 0); //;w will wait until the input buffer has a character
20   {
21     number1 = Serial.parseFloat(); //Serial.parseFloat() reutnrs the first valid number from the Serial Buffer
22     Serial.print ("Number 1 = ");
23     Serial.println (number1); //Displays User Input
24     while (Serial.available() > 0) //Removes non-numeric characters from the buffer
25     {
26       junk = Serial.read(); //Clears the Keyboard Buffer for next input
27     }
28   }
29   //Input Process for Input Number 2 (NOTE: Process is the same as input for number 1)|
30   Serial.println ("Enter Number 2: ");
31   while (Serial.available() == 0);
32   {
33     number2 = Serial.parseFloat();
34     Serial.print ("Number 2= ");
35     Serial.println (number2);
36     while (Serial.available() >0)
37     {
38       junk = Serial.read();
39     }
40   }
41   sum = number1 + number2; //Calculates the Sum
42   Serial.print ("sum ");
43   Serial.println (sum); //Outputs the Sum
44 }
```

b. Run the Simulation > Open Serial Monitor > Enter Data when Asked > Press Send to accept the entry > Check Answer

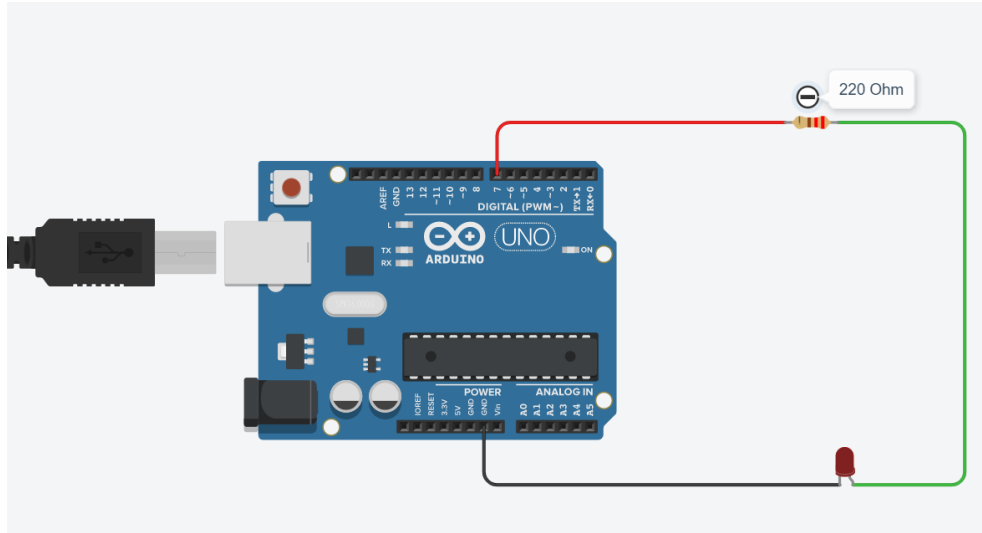


Type in the Value

Press Send to  
accept the value

## Part 2: Controlling Arduino Board LED

- a. Wire the following Circuit
- b. Declare in Void Setup > pinMode (7, OUTPUT);  
NOTE: May use a variable for port 7 (i.e int redled = 7;)



### Modify the code to do the following

- a. Change the code to calculate the volume of a cone
- b. Flash the lights as follows
  - i. Volume < 100
    - Flash ON = 2 sec
    - OFF = 2sec
    - 3 Times (USE For Loop or Do/While Loop)
  - ii.  $100 \leq \text{Volume} \leq 500$ 
    - Flash ON = 1 sec
    - OFF = 3 sec
    - 3 Times (USE For Loop or Do/While Loop)
  - iii. Volume > 500
    - Flash ON = .5 sec
    - OFF = 2sec
    - 3 Times (USE For Loop or Do/While Loop)

**Hint:** If statements can only check one thing at a time. For example finding a number between 1 and 10.

Mathematical way to write range  $1 \leq x \leq 10$

Programming way to write range if  $(x \geq 1 \ \&\& \ x \leq 10)$  then.... This if statement would have code carried out when any number that is between 1 and 10. Notice the use of the AND (&&) statement to connect the two comparisons. Both sides has to be true in order to carry out the proceeding code.

Programming to stay outside the 1- 10 if  $(x < 1 \ || \ x > 10)$  then.... This if statement would have code carried out when numbers are outside 1-10. Notice the use of the OR (||) statement. Only one side has to be true to carry out the proceeding code

- c. Run the simulation > Test the various options to make sure the LED turns on and off correctly.

### Part 3: Limiting the times through the loop

NOTE: There is no way to exit the Void Loop() in Arduino. However a delay statement or moving into a loop that does nothing can solve this problem. (I.E Create a Loop: while (true) {} (while TRUE will always make the loop true so it will run infinitely.) Modify the program to do the following

1. After the first time through the program ask the user if they want to find the volume of another cone.  
Use 0 for Yes and 1 for No
  - a. If Yes repeat the program
  - b. If No end the program and say "Goodbye!"

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