Lab 01: Arduino 01
Due: September 9th, 2019
20 Points

Name _____

Purpose: This lab will introduce you to the fundamentals of electric circuits. There are actually 3 simple circuits that you build in the lab period, each building upon the knowledge you gain in the previous one. You are also introduced to some of the basic components we will be using, namely the breadboard, wires, resistors, LEDs and switches.

Preparatory: You should have complete lab 0 successfully (lab 00 in your green and white book). You will need your arduino kit to perform the lab and you will also read through the entire lab in the book (page 20 to 31)
Warning! Remember that LEDs will burn out if used without a resistor! You need a 220 ohm resistor (see page 41 in the book for help). Also remember that LEDs are directional and the long leg (anode) must go to power (+) and the shorter leg ground!

Submission: This lab will be turned in **at the beginning** of our next lab class. You may complete the lab on the handed out copy and turn in. There is no digital submission in iLearn required, i will add your lab grade there when it is graded.

Questions:

1. What changes other types of energy into electrical energy and vice-versa:
   _____
2. Things that convert other forms of energy into electrical energy are called
   _____
3. Things that convert Electrical energy into other forms of energy are called
   _____.
4. _____ are closed loops of wire with a power source that do something useful with the energy.
5. Energy flows from a point of _____ potential energy (referred to as power +) to a point of _____ potential energy.
6. Usually the point of least potential energy in a circuit is known as
   _____

7. Circuits where electricity always flows in one direction are known as _____

8. Circuits where electricity changes direction many time a second are known as _____

9. The difference in energy between one point of a circuit and another is called: _____ The symbol used to denote it is: _____

10. The amount of electrical charge flowing past a specific point in your circuit is called: _____ The measurement we use for it is called: _____ and it uses the _____ symbol

11. How much a component reduces the electrical flow of energy moving though it is called _____. It is measured in _____ and uses the _____ symbol.

12. The long leg of an LED is called an _____ which connects to _____ the shorter leg connects to _____.

13. A component that resists the flow of electricity by converting some of it to heat so that other components may get specific levels of voltage they require are called _____.

Circuit 1:

14. The arduino is used in this lab to provide the circuit _____.

15. Pressing the button on your breadboard results in _____.

Circuit 2:

16. What do you have to do to light the LED in the Series circuit?

_____.

Why?

Circuit 3:

17. What do you have to do to light the LED in the Parallel circuit?
_____.

Why?

18. Using Ohm's law answer the following: given that your circuit is provided 12 volts and you have a 220 ohm resistor in the circuit, what is current measured in milliamps going to the LED? (show your math, 2pts)