

Project 1: Car alarm system

Connect the components and program the Arduino to create a car alarm system as described next.

Components needed:

- Arduino
- 2 push buttons
- 1 buzzer
- 1 green led
- 1 red led

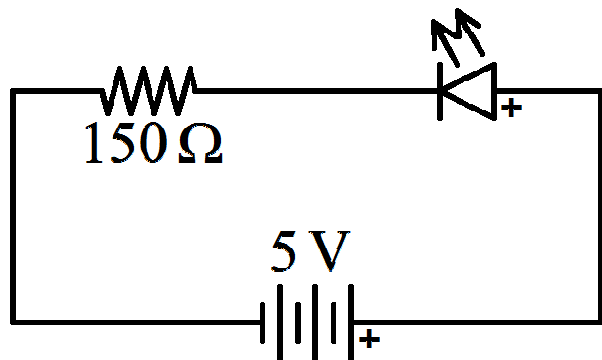
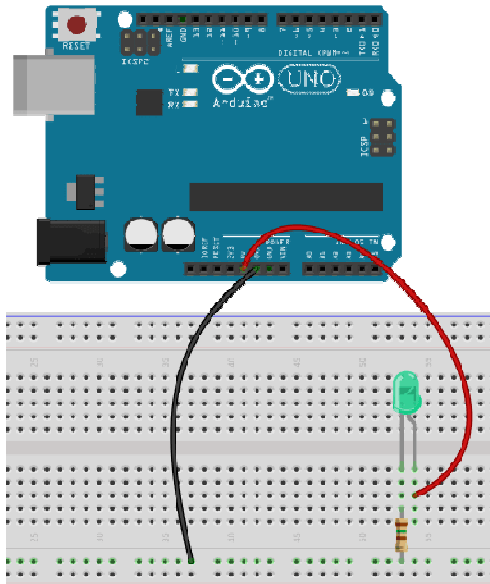
System detail:

The car alarm system has the following features:

1. Turn on both leds for half a second when power is turned on or reset to show that the system is ready.
2. One push button (button A) is the master switch used for turning on and off the system. Each short press (less than 1 second) of the button will alternate back and forth between turning on the system and turning off the system.
3. The green led is turned on together with a double beep on the buzzer to show that the system is on. The led is turned off together with a single beep to show that the system is off. Note that this is NOT to show whether the alarm is on or off. (3)¹
4. One push button (button B) for the car door switch.
5. The alarm is turned on when the system is on and the door switch is pressed. The output alarm consists of the red led and the buzzer. The buzzer will alternate between a high pitch (1000 Hz) and a low pitch (440 Hz) at a rate of 1 Hz. The red led will flash at a rate of 1 Hz. (4)
6. A short press (less than 1 second) on button A will turn off the alarm.
7. Keep a count of how many times the alarm has been turned on.
8. A long press (more than 1 second) on button A will show the alarm count (from step 7) by blinking both the red and green leds that many times at a rate of 1 Hz. (5)

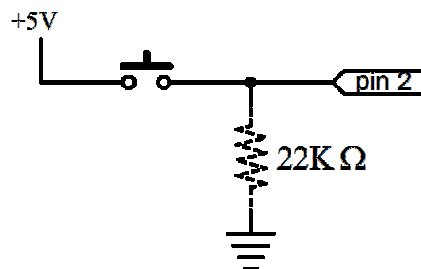
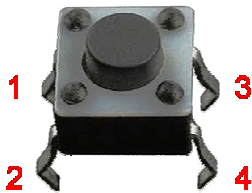
¹ Numbers in parenthesis are points that you get when you accomplish up to that step. Total points possible is 5.

LED connections:



The long leg on the LED is the positive side.

Push button connections:



An internal pull-down resistor is built-in to each of the digital pins on the Arduino so you do not need to connect the resistor. Use the command `pinMode(2, OUTPUT)` to use the pull-down resistor on pin 2 and use pin 2 for **input**. Note that the input/output direction is different.