COLOUR DETECTION BASED ROBOTIC AUTOMATION

ECE366 Project

Submitted by:

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Submitted to:

Dr. Sachin Gupta

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Abstract:

The Main aim of this project is demonstrating the methodology for identifying the shades of the colors with an exact prediction by their RGB values. According to a study, a normal human can able to identify nearly 1 million shades of the colors, so in this project we used LABVIEW software for identifying some shades of the colors. RGB are the three different colors which are helpful in forming all types of colours. In robotics these colors play very important role that are helpful to recognizing/ identifying the shades of the object easily.

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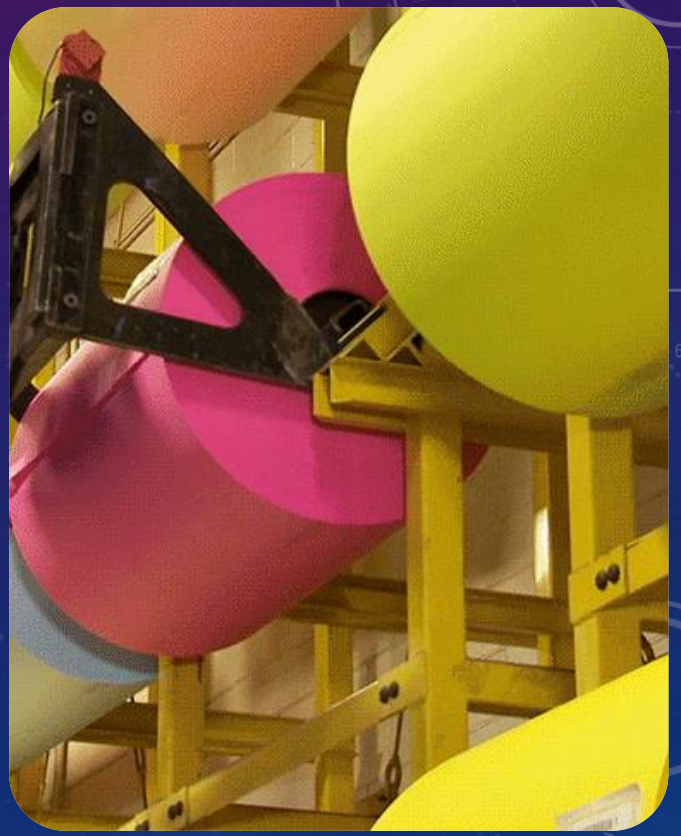
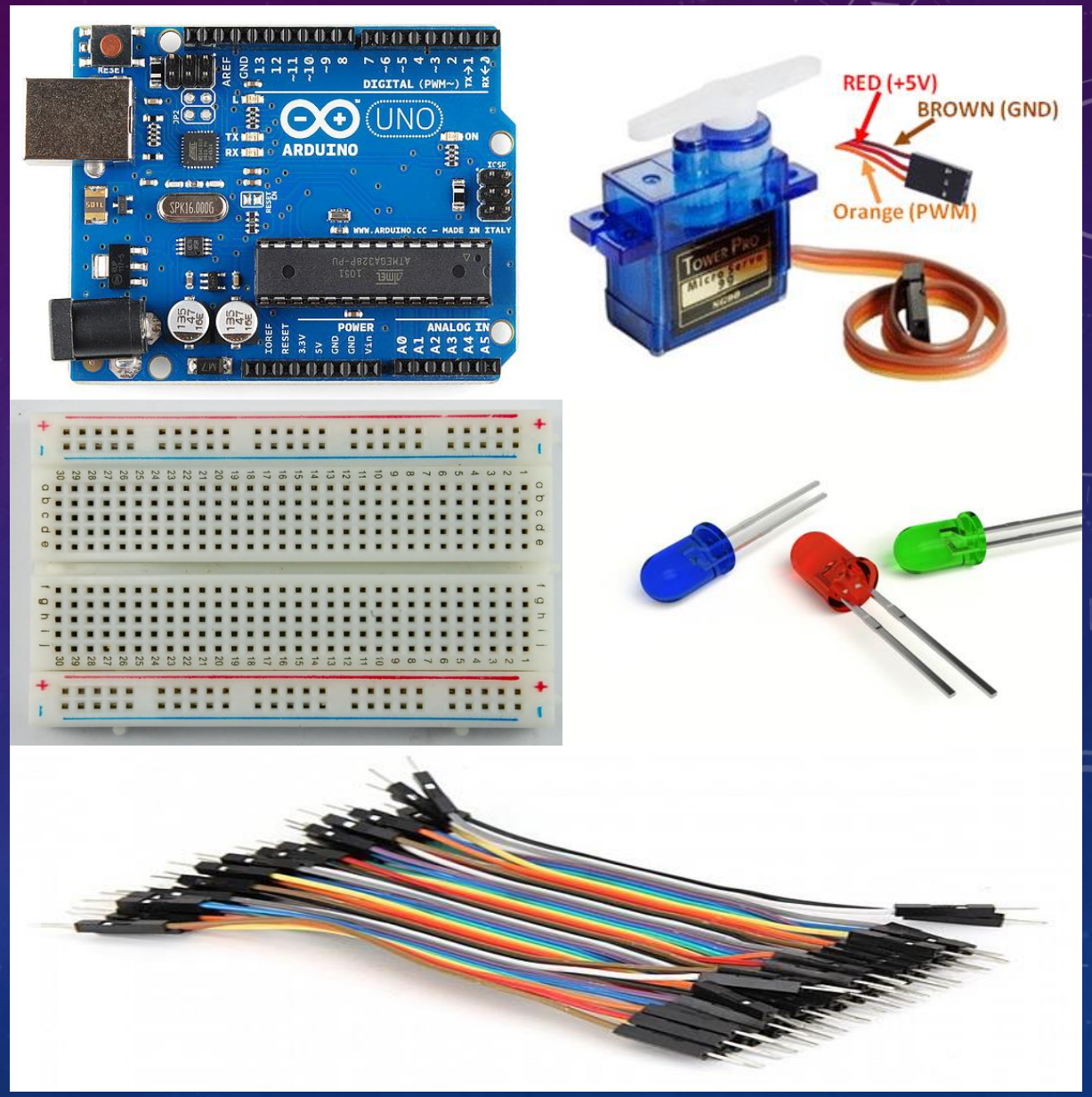
Introduction:

- This type of automated system can be used in warehouses for reducing human efforts.
- For implementing this project, we used LabView software.
- In LabView software we designed a system with vision and maker hub modules that is used to detect the colors and send according output to Arduino.
- In this we used 2 Arduinos, 1 for communication with LabView and other for giving instructions to servo motors to perform assigned task.



Components used:

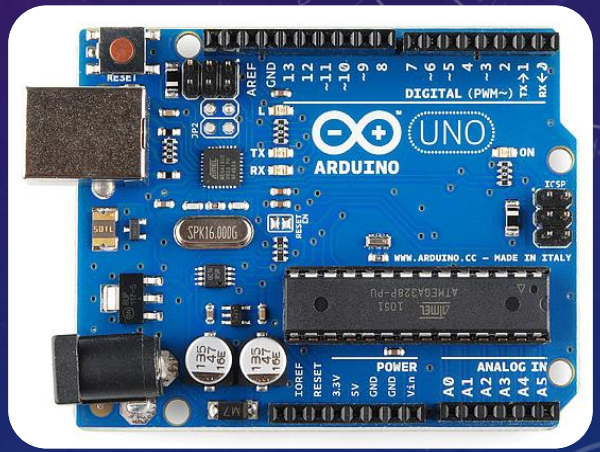
1. Arduino UNO
2. Servo motors
3. Bread board
4. Leds
5. Jumper Wires



Arduino UNO

Arduino UNO board is the open-source software and hardware microcontroller board. In this project we used two Arduinos.

1. For communication with LabView
2. For running servo motors as per output received from first Arduino.

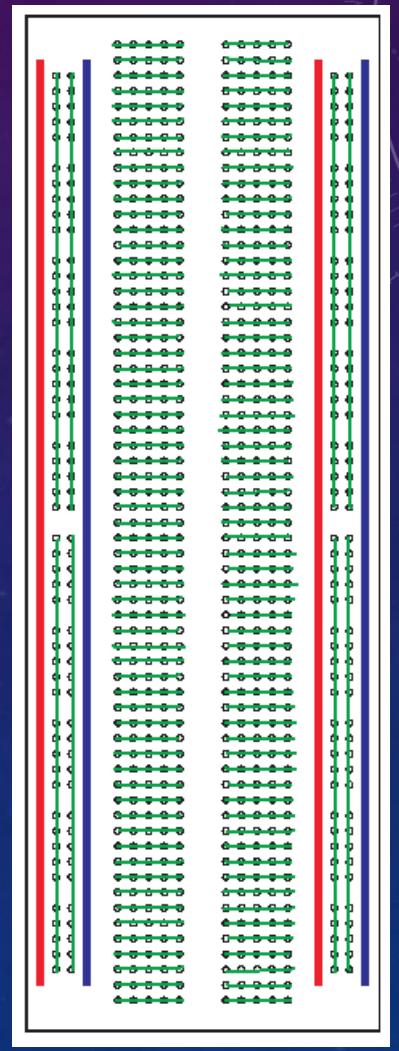


Servo motors:

- A servo motor is a type of motor that can rotate with great precision.
- Normally this type of motor consists of a control circuit that provides feedback on the current position, this feedback allows the servo motors to rotate with great precision.
- If the motor is rotating with DC powered by a DC power supply, then it is called DC servo motor, and if it is AC-powered motor then it is called AC servo motor.
- Here in this project we are using 3 DC micro Servo Motors.

Breadboard:

- A breadboard (sometimes called a proto-board) is used for building temporary circuits.
- It is very useful to users/designers because it allows components to be removed and replaced easily.
- It is useful to the person who wants to build a circuit to demonstrate its action, then to reuse the components in another circuit.

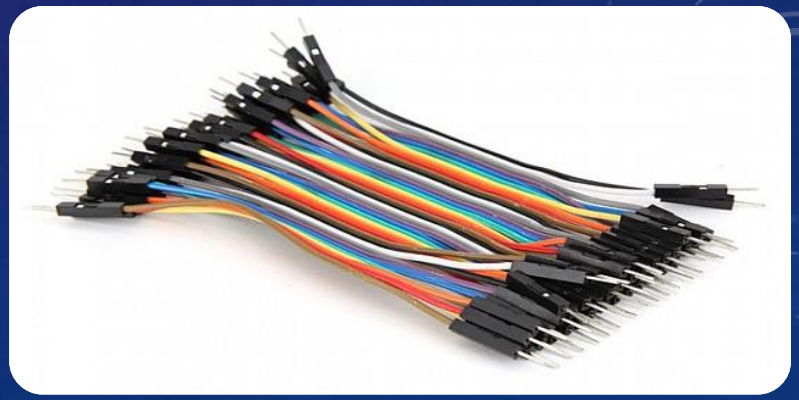


LEDs

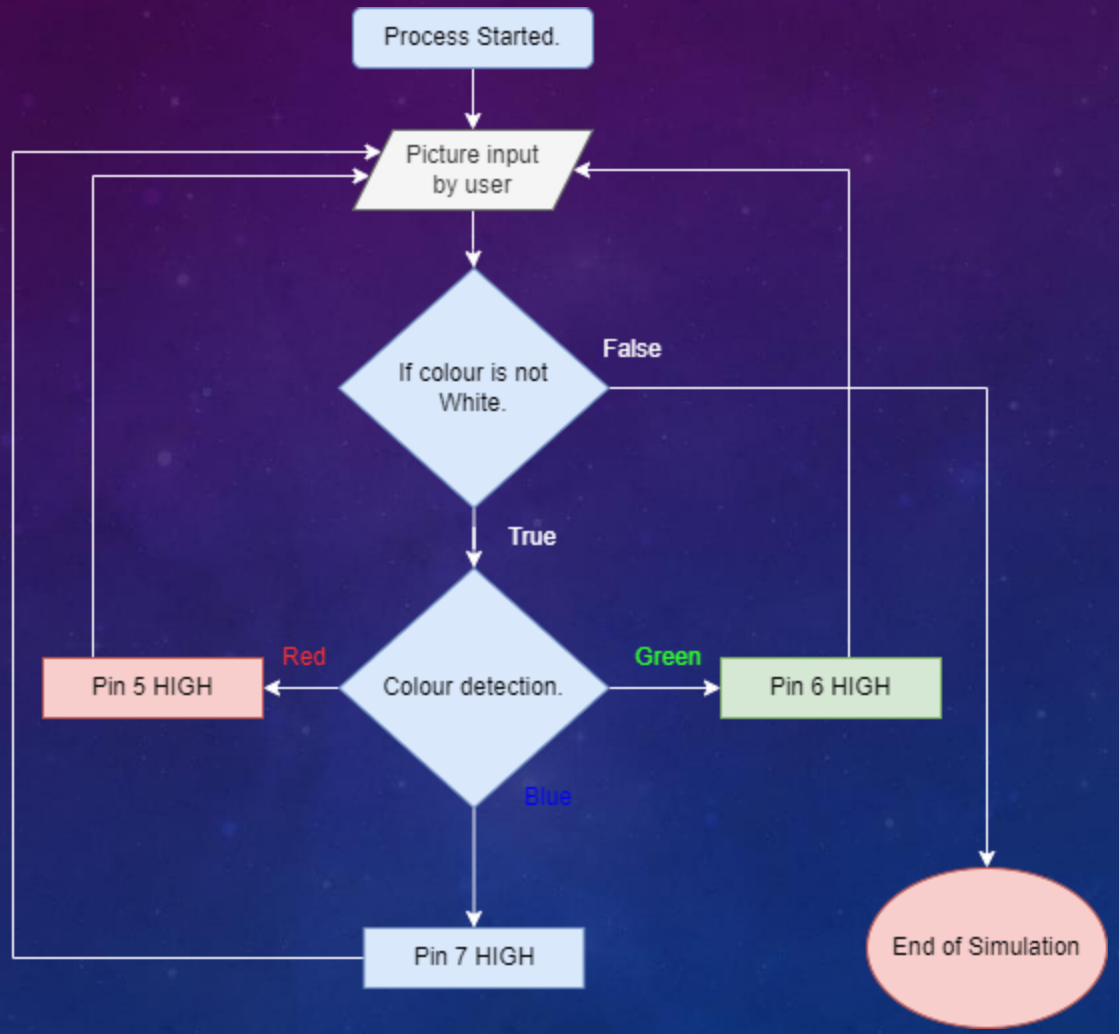
- In this project LEDs are just used for checking whether the 1st Arduino is giving correct output or not.

Jumper wires

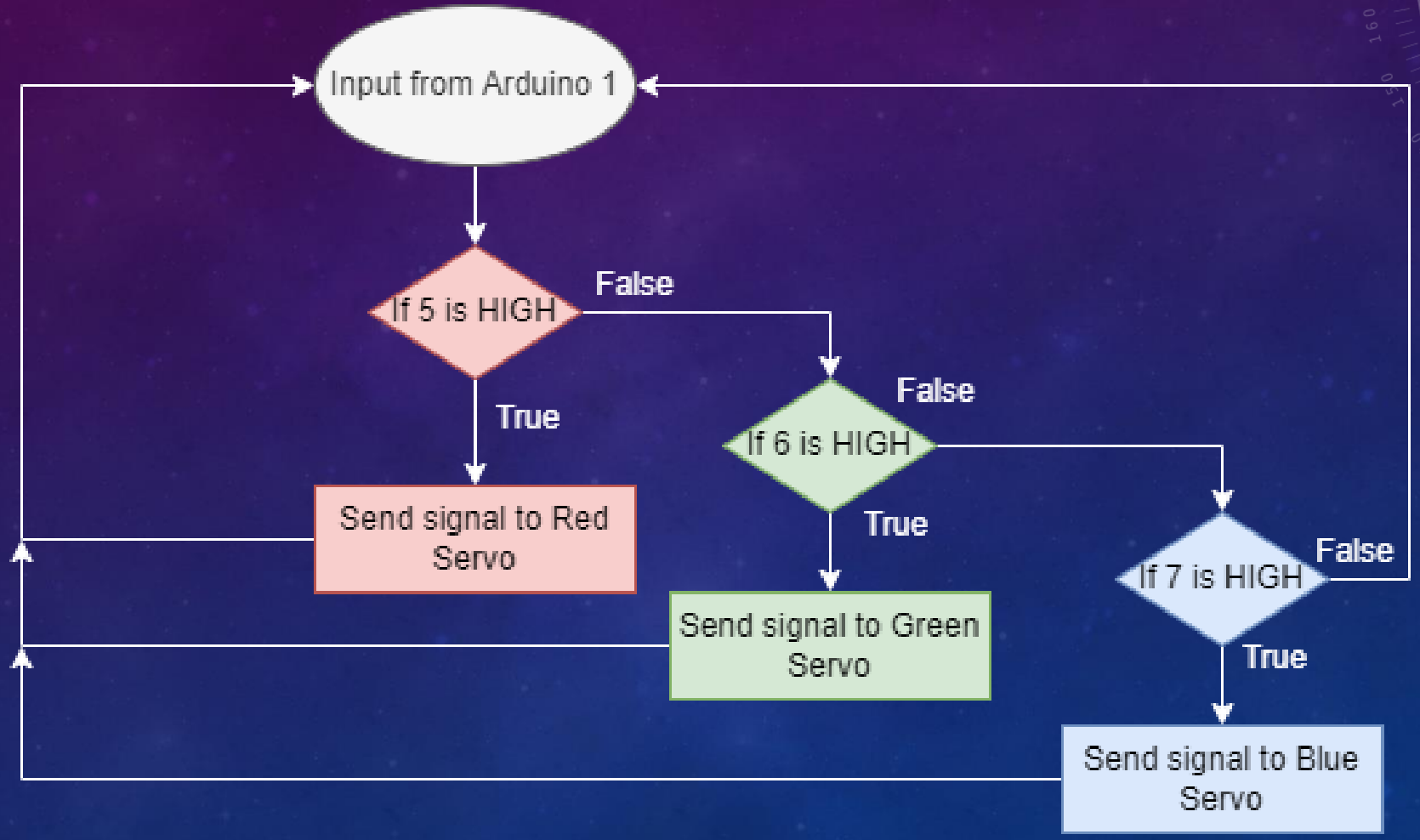
- Here we used male to male jumper wires for connecting Arduino and other components together on breadboard.
- These makes connections easy on breadboard.



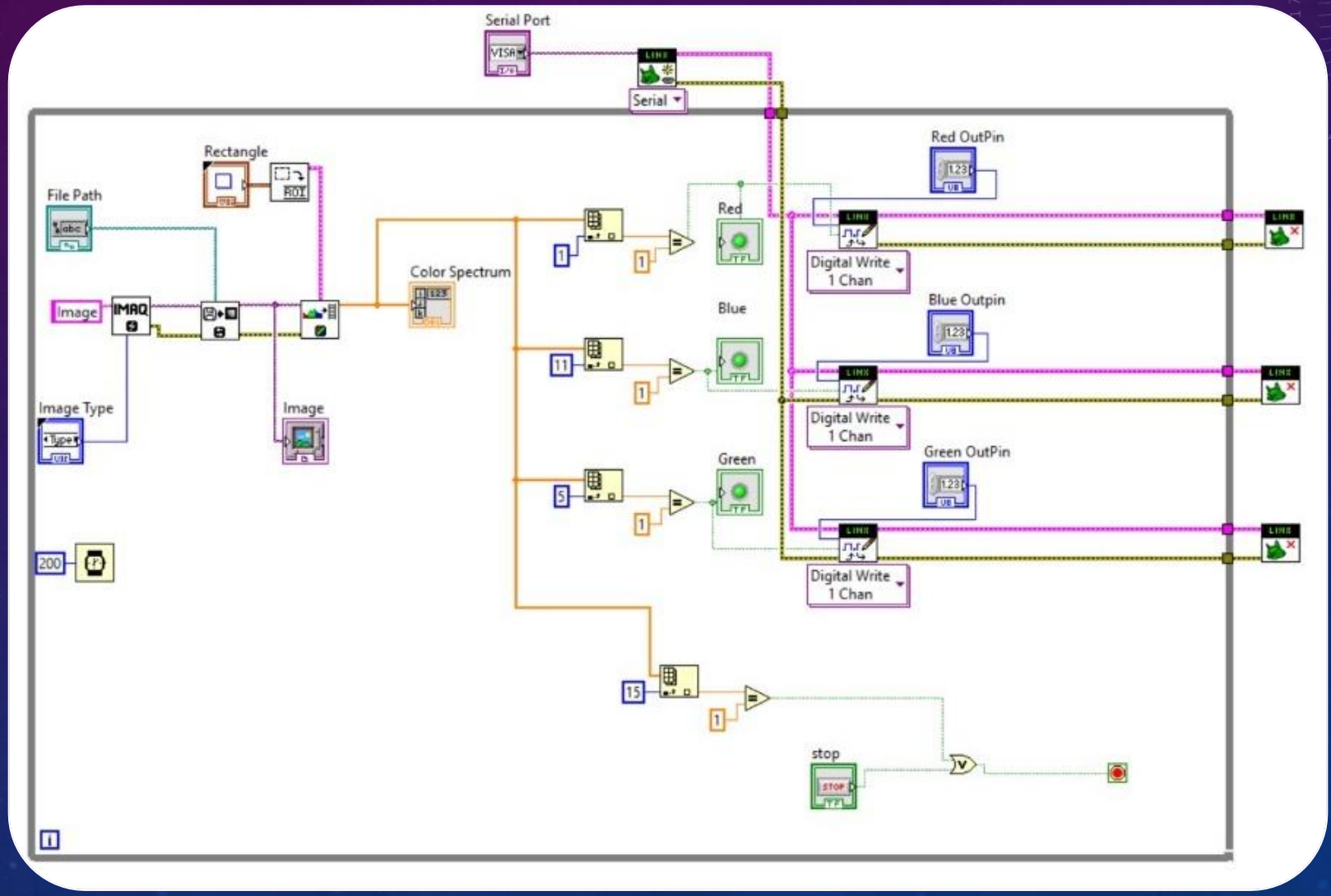
Flow chart for LabView & Arduino 1:



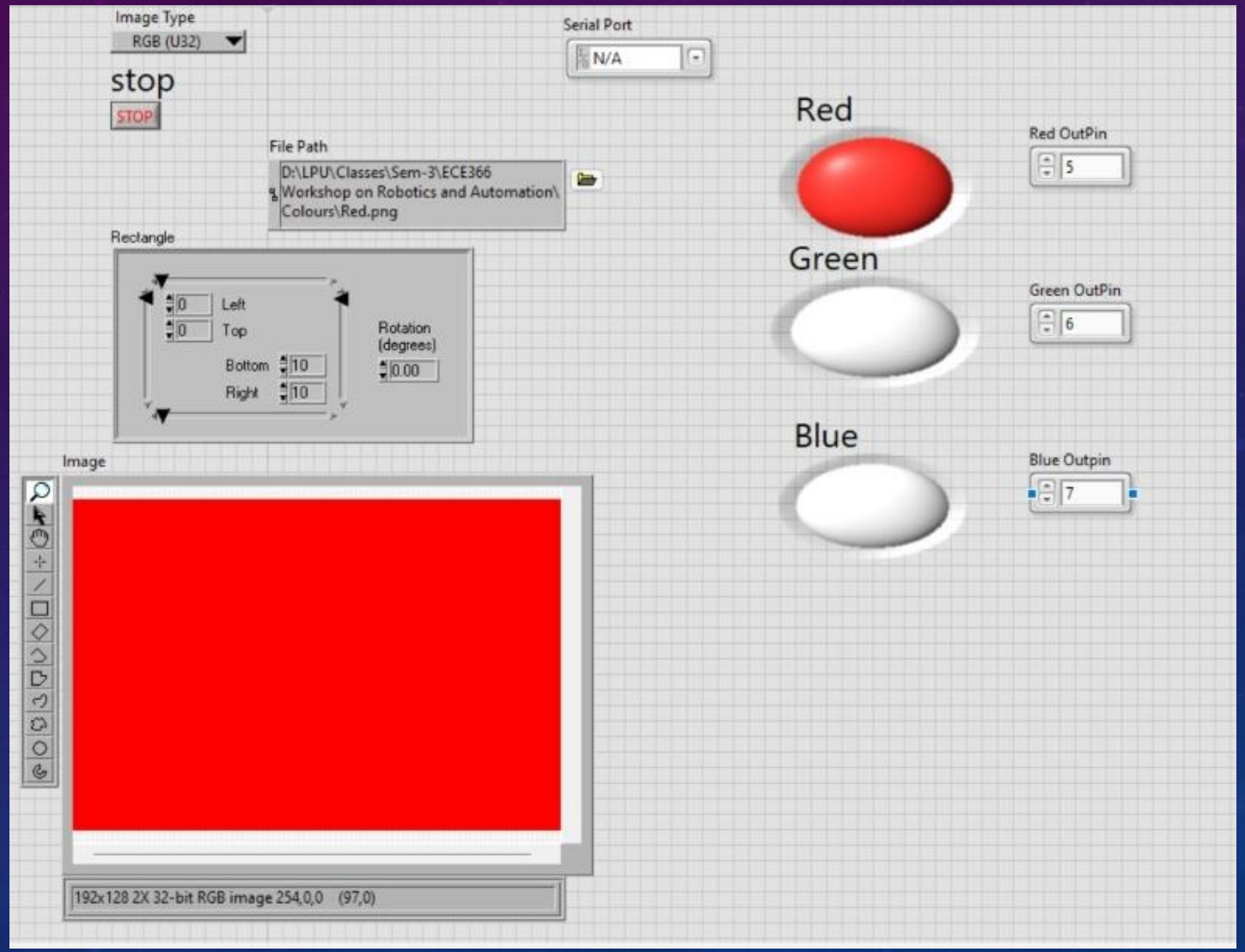
Flow chart for Arduino 2 :



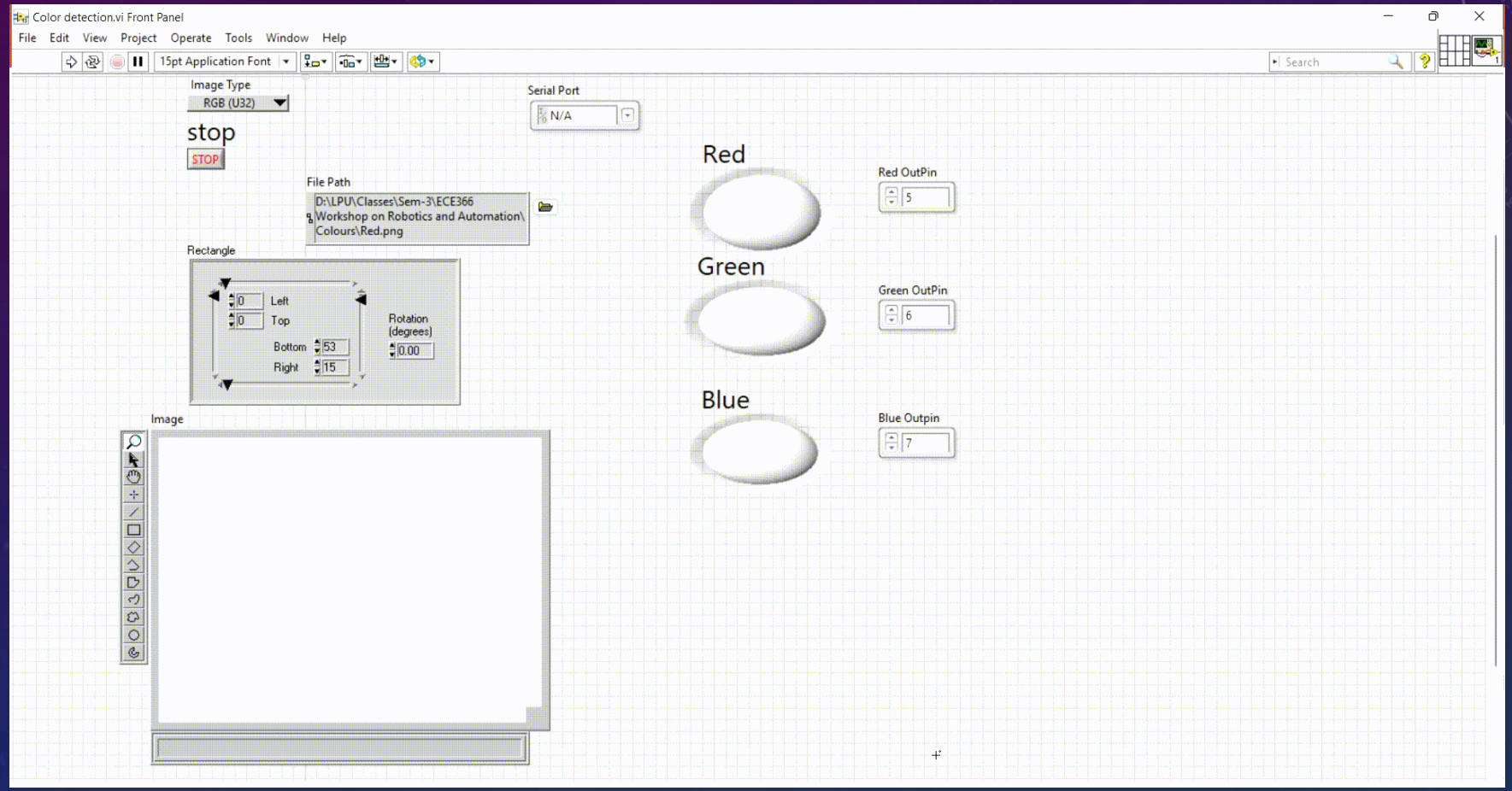
Project code(LabVIEW Block diagram):



Front panel (LabView):



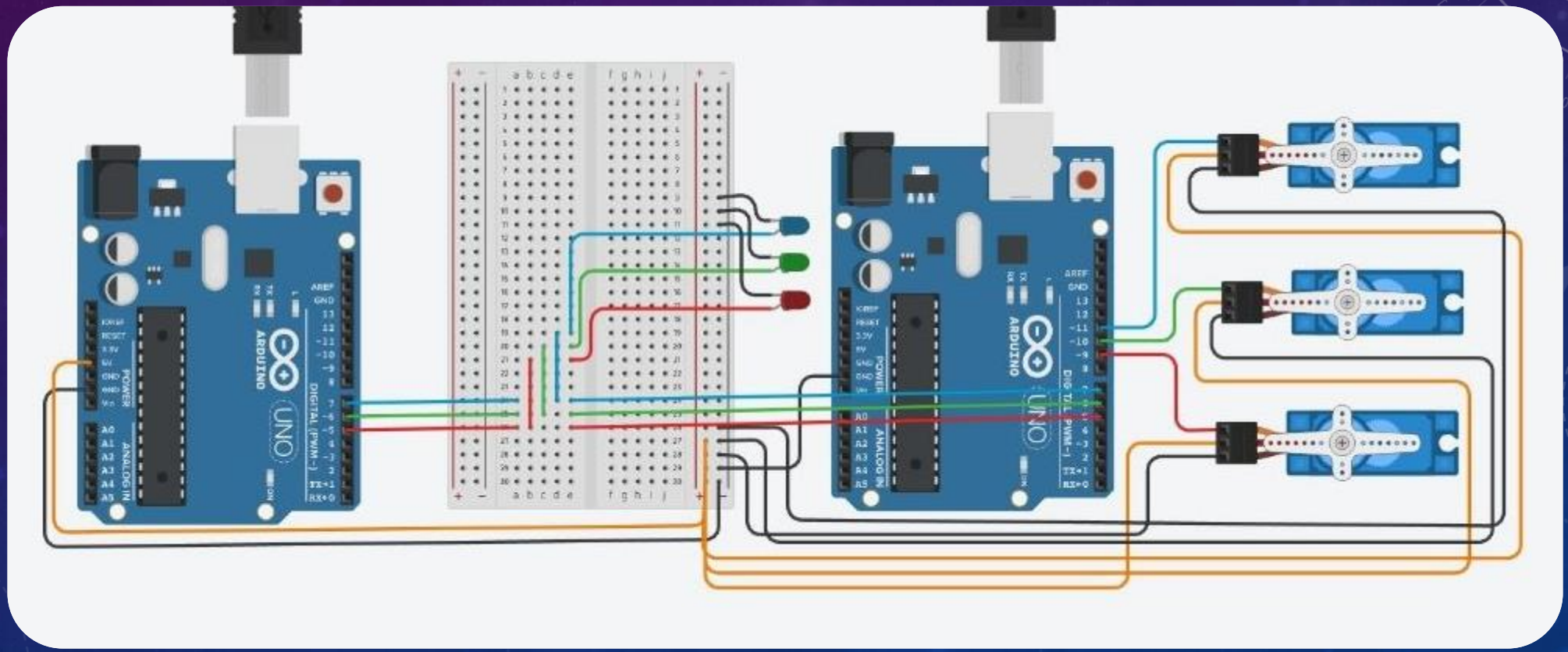
Project plan:



Arduino connections (External):

LabView

Power Supply



Result and discussion:

- Our system is now able to detect and differentiate between colours which are trained to it before.
- LabView is able to communicate with Arduino and send signals based on colour that is detected.
- Using this technique we can automate things with ease in industries and even illiterate can work with this type of systems because this system completely works with only colours.

Future scope:

- In this project we are using 2 Arduinos. We can even use one Arduino to complete this project by directly sending signals to servo motors using VISA module in LabView.
- We can use a better quality camera in this project other than giving colour file as input to LabView.
- We can even make the system faster by implementing this in dedicated system or high standard systems.

Conclusion:

- Finally we implemented many of the modules we learnt in LabView software for completing this project.
- This colour detection based automation makes things easier to design, implement and debug in case of any issues.

References:

- ***LabVIEW™ for Everyone: Graphical Programming Made Easy and Fun, Third Edition*** - By Jeffrey Travis, Jim Kring Publisher: **Prentice Hall** Pub Date: July 27, 2006 Print ISBN-10: *0-13-185672-3* Print ISBN-13: *978-0-13-185672-1*

- ***Introduction to LabVIEW*** ™ Six-Hour Course : **September 2003** Edition Part Number **323669B-01** -***© 2003 National Instruments Corporation***

- ***VIRTUAL INSTRUMENTATION USING LabVIEW*** ™ **:**Jovitha Jerome- Print ISBN-*978-81-203-4030-5*-***© 2010 by PHI Learning Private Limited, New Delhi***. Published by Asoke K. Ghosh, *PHI Learning Private Limited*, M-97, Connaught Circus, New Delhi-110001

Any queries

Thank You