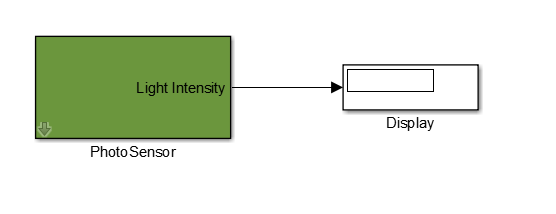
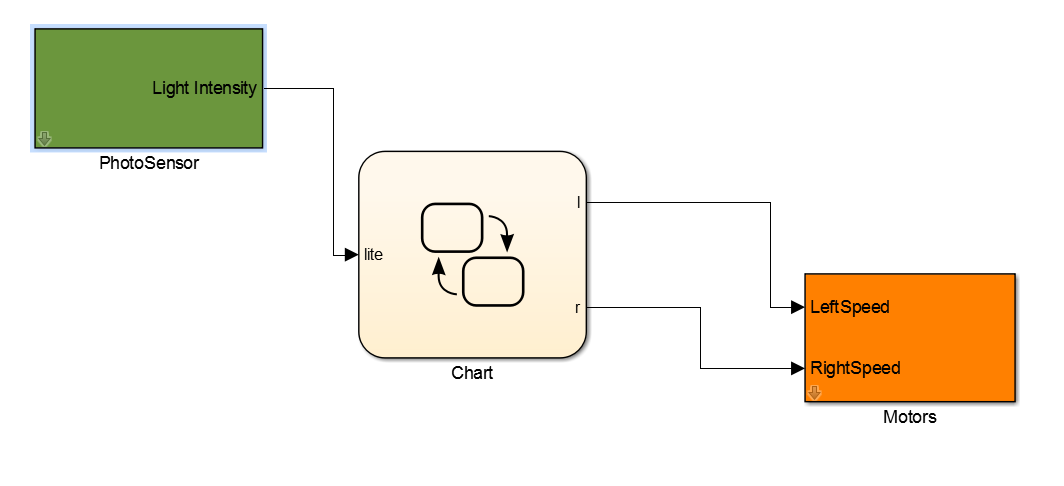
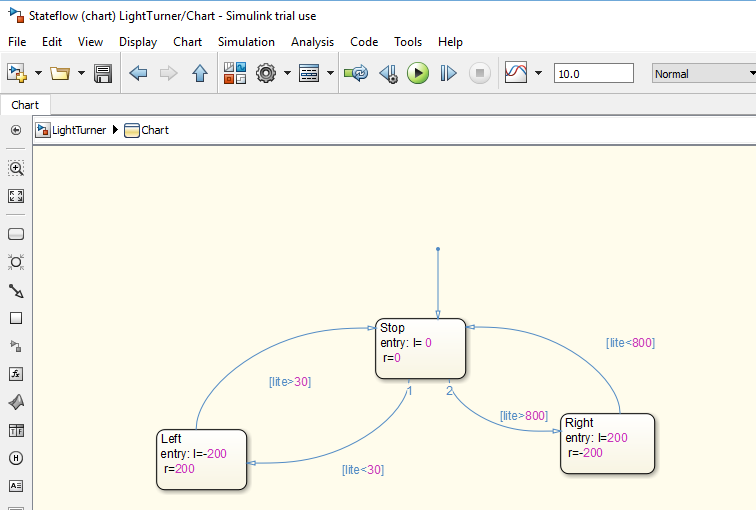
Standards Covered: (f), (g), (h), (i), (j)

**Part 1**

Goals: To test the photosensor on the MiniQ robot and record values for the light turner miniQ exercise.

Sequence:

1. Present students with the idea of a “light turner robot”. How it will turn when a hand is in front of it. This can be made by recording the photo sensor values on the miniQ robot. Create the Simulink model with students: *(10 min)* 
2. Students begin on creating a Simulink model to get the desired behavior- “light turning robot.” This template should be presented after students have had the opportunity to experiment with creating a model themselves: *(30 min)* 
3. Have students program in colors on the RBG light for when the robot turns. *(20 min)*

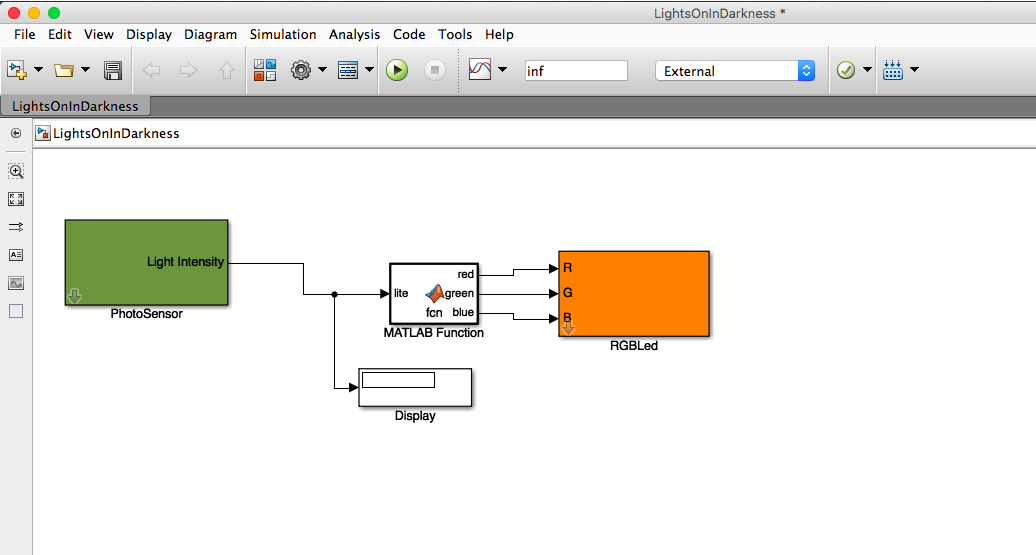
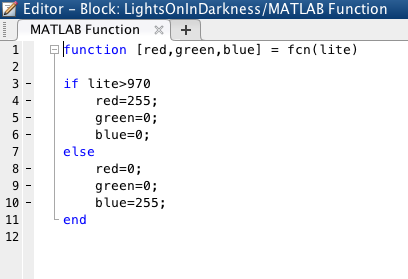


**Part 2**

Reference: Index: LightsOnInDarkness.slx

Goals:In the Simulink model below, whenever the lights dim the RGB LED on the miniQ robot will change color.

Sequence:

1. Students are tasked with creating a robot whose lights change color when the room is dark. Give students time to create this Simulink model on their own before presenting them with the LightsOnInDarkness.slx file *(20 min)*
2. Review the LightsOnInDarkness.slx file, explain the construction of the function and how the lines of code can be represented in Simulink as well *(20 min)* 
3. If we click into the MATLAB function block what we’ll see is the code below. The outputs on the function are [red,green,blue] while the input into the function is named “lite”. This construction can be seen in line 1: 
4. So when the lite reading is greater than 970 the red value will output 255 while the green and blue values provide 0 as their output. This will cause the RGB LED to turn red when the lights are dim “else” (in line 7) the LED color will be blue.

Activity:

1. Experiment with different color values as well as “lite” intensity thresholds (in line 3) to see what occurs. *(20 min)*

Evaluation:

1. Students present their light turner bots to peers and talk about what the different colors on their robot represent as far as the Mini Qs movement.
2. Have students run their light turner robots in a small location. An activity to consider is to see if there is a way to time the sequence of turns and also coordinate the colors which the robots flash.
3. Have the robots turn in circles and change colors when the lights are turned off in the room.

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