

# APSC 200 P2: Week 3 Outline

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Queen's University

July 23, 2019

## 1 Objectives

The general objectives for this week are

1. to create a folder in which to place your MATLAB functions and simulation app,
2. to begin translating mathematics from Week 2 into MATLAB code, and
3. to continue documenting your design process in preparation for the final report by
  - (a) establishing metrics to evaluate design choices, and
  - (b) beginning Triple Bottom Line analyses for your project.

### 1.1 Formation Algorithm

1. Implement the adjacency matrix formulas derived in Week 2 in the *calcA.m* function.
2. Write code for the *calcL.m* function that calculates the Laplacian Matrix given the adjacency matrix.

### 1.2 Flocking Algorithm

1. Use *MatrixEditorFlocking* app to enter leader path, parameters, and initial agent data derived in Week 2.
2. Write code for the *calcA.m* function that calculates the adjacency matrix design parameters used for the algorithm and the current distance between agents.
3. Write code for the *calcL.m* function that calculates the Laplacian matrix given some adjacency matrix.

### 1.3 Opinion Algorithm

1. Use *MatrixEditorOpinion* app to enter initial node data derived in Week 2.
2. Write code for the *calcA.m* function that calculates the adjacency matrix using the radius of communication and the distance between nodes.
3. Write code for the *calcL.m* function that calculates the Laplacian matrix given some adjacency matrix.

### 1.4 Lloyd's Algorithm

1. Use *MatrixEditorLloyd* app to input density. functions/matrices constructed in Week 2 and initial agent positions
2. Write code for the *communication.m* function to determine which agents are in communication.
3. Write code for the *assignAgentPoints.m* function to determine the observed region of each agent.

## **2 Lectures and Workshops**

There are two workshops scheduled for this week. During these times, you are to work on the above tasks and ask TAs any questions you may have about your project.

## **3 Deliverables**

This weeks deliverables are

1. Progress Report 1.