COGS 400/CISC/CMPE 452
Assignment 2
Perceptron

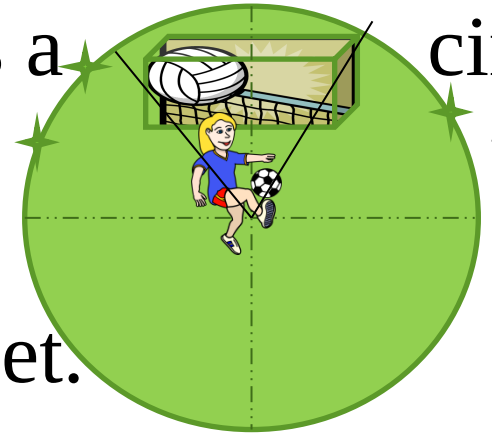
Farhana Zulkernine

General Instructions for Code and Submission
(for all assignments)

- You can use any programming language (preferred C, C++, Java, or Matlab)
- For all assignments you have to submit
  - The source code with inline comments and comments in the beginning of the program saying briefly what your program does and how.
  - The executable with anything else that may be required to run your binary (libraries, input).
  - A readme.txt or word document file explaining your results. Your choice of initial values of variables and architecture of your network can influence your results.
  - Outputs as requested (as a text or doc file)
- Make **one zip file named as Asg#_studentID**.
- Upload your assignment to the moodle site.

Assignment 2

- Let's say that a blind person is shooting soccer ball from the centre of the field. Her friends standing outside the field is guiding her by saying 'left/right/goal' to indicate if she has to shoot more towards left or right or if it is a goal. There is a circular net that helps to keep the ball inside. The stars show where the ball hits the net.



Assignment 2 (cont…)

- Design a perceptron that would model this and learn the correct shooting angle based on the feedback 1=left, -1=right and 0=goal by finding the linear separators that identify the zone from the shooting point to the insides of the goal posts.
- Apply both learning algorithms (simple feedback and error correction) and compare them based on training time and final outcomes.
- Assume that
  - someone always puts the ball at the same point in front of the middle of the goal posts.
  - The shooter always shoots in straight line.

Data (x, y, d)

- The 2-D points on the net where the ball hits and the corresponding feedbacks are given in the attached excel file.
- Assume the initial weights and the learning rate. Mention those in your report.

Outputs

- Submit
  - The initial and final weights of the perceptrons and explain your overall result (time to train, experience of assumed learning rates and initial weights, final results) for both
    - Simple feedback learning
    - Error correction learning
  - What parameter can you use to model the learning for the following two types of players? Why? Explain.
    a) What if the player is impatient and restless?
    b) What if the player is very focused and attentive?

Deliverables

- A zip file **Asg#_studentID** containing the following.
  - The source code with comments.
  - A readme.txt or word document file with necessary explanations, execution instructions and output data (as requested). Remember that two learning algorithms have to be implemented.
  - The executable with other modules if required for execution (include in the text file how to execute code if special input is required). If a data file is needed for execution, include it in the same directory as your executable in the zip file.
    - You will not get the 3 marks if we cannot execute your code.

Marks and Deadline

- Assignment should be uploaded to Moodle by **October 18, 2015**.
- Mark Distribution for a total of **10 marks**
  - Comments in program (in line and beginning of program) and explanations: 2 marks
  - Proper execution : 4 marks
  - Output : 4 marks (2 algorithms + explanations)
- Late submission each day -1.