**CSCE 155N Matlab Programming Project 1 – Summer 2012**

**Assigned: Tuesday 7/23/2013**

**DUE DATE:**

**Monday 7/29/2013 at 11:59 PM**

**(hardcopy in class on Tuesday)**

**Duel to the Death!**

**Problem Statement:**

The class Web site has a short script *cannonGame.m* that has a single player fire cannon shots at some stationary object with the goal of hitting it in a minimum number of shots. A plot is displayed showing the arc of the cannonball. This program may be used as a starting point for our project.

We are simulating a duel in which the parties pick their weapons, and on a count (which should be counted out in real time) step away from each other, then turn, aim, and fire. The quickness of turning, aiming, and firing is input by the players at each round, noting that this does affect accuracy. If neither is dispatched in the round, another round is begun with the count reduced. There are many details that are not specified, and you are encouraged to be inventive in what you decide to do.

Have the two players enter their names so that the computer uses it in the updates. Then rather than having cannons (not very common in duels!), allow the players an option of several weapons, including both lethal and non-lethal such as pistol, bow and arrow, paint ball, or squirt gun. Research or experiment and use realistic data for the weapons you permit, such as speed, weight (if relevant), maximum kill distance, aerodynamic characteristics, etc. Make careful use of random numbers in representing human error factors that are somewhat dependent on quickness of the draw. Note that one does want to be quick enough to fire before being hit! With each round, the duelists march fewer steps away from each other so they become progressively closer. Consider each person (as a target) to be composed of rectangles representing the head, torso, arms, and legs. Lethal weapons will kill upon hitting the head or torso with at least some minimum velocity, and will impair the target in various ways when hitting elsewhere. What you do with non-lethal weapons is up to you!

You are to work in teams of two or three students to design prototypes in Matlab. Larger teams may be allowed by permission, but there would be higher expectations.

**Collaboration:**

Work together as a class on any or all aspects of the research and design. Ideally take advantage of the talents of each member of the team, but recognize that each is responsible for the entire project! This means being prepared to answer questions on the code even if your allocated task was to write the report. It is essential to keep track of who did what and where any useful information was found. Record each time you helped someone else and each time someone helped you. Keeping a log is highly recommended. Note that Piazza keeps a record automatically!

**What and How to Submit:**

Read and have your program conform to the “Program Documentation Guidelines” which are online.

By the deadline hand in electronically the two files, duel.m (the Matlab script file for the game), and duel.doc (which contains summaries, documentation, and sample runs). Only one copy per group needs to be submitted – it does not matter who does the handing it. In class the day after the deadline, hand in the hardcopy version, stapled together with the cover page in front.

Each team member should electronically on his/her own account submit his/her own analysis of the relative contributions of all the members toward the project. This is in addition to the acknowledgement section of the main report. Assuming allocation is fairly even, all will receive the same grade.

The Word document should contain the following, all carefully labeled:

* Cover page with name(s) and the account under which it is submitted, title, date submitted, etc.
* A discussion of the features you implemented in the project. Describe how they work and what Matlab options were used to program them. This should be at a fairly high level, not a line-by-line analysis of the code.
* An “instruction manual” that a non-programmer can use to run the duel game.
* An annotated cut and paste sample dialog of the running of the program. (Hint: Use the ‘diary’ command and/or capture screen shots.)
* A discussion of the testing that was performed. This should include testing of each component as it was being built, and testing of the final program ensuring that it works properly under a comprehensive range of conditions.
* An annotated cut and paste of a sample dialog, demonstrating how your program responds to extreme and faulty input. (This could be combined with the previous section.)
* Acknowledge all collaborations (both internal to the team and external), detailing what each person contributed individually, and what was done jointly. Indicate approximate percentages of the work contributed by each person in design, coding, testing, documentation, and report preparation.

**Grading Criteria:**

* Program functions as intended – 30%
* Program logic is well designed – 20%
* Documentation guidelines are followed – 20%
* Handin Documents formatted and arranged as specified – 10%
* Testing is comprehensive – 10%
* Quality of the user’s manual – 10%