ENG 06 Fall 2021 Final Project

Up to now in ENG6, we have focused on teaching you the "how" of programming. In the team project you will be taking your own ideas and bringing them to fruition through your knowledge of computer programming. Software development is rarely a one-person effort, so the project will be team-based. Teams can be formed with members of any section. You can form your own team of **four**. No other team size will be allowed. Only if strictly needed, the TAs may form smaller teams or add members to teams. *Beyond the core part of the final project, we ask you to implement a number of special features, called Reach elements, so as to make your project different from your classmates.*

Important: We discourage the use of other Matlab code written by someone else, however, if you use it you must reference the code creator.

Project: Dice Game

Project Description: Implement a MATLAB computer program of dice game of your team's choice. For example, possible candidates are Farkle. Or Left Center Right. An example of a computer dice game implementation is Yahtzee. (it is clear what is expected of the players, however with respect to the visual and auditory aspects, it is not a good example). The dice game must involve one or two players. A player should be able to make strategic decisions to win the game. The program should roll the dice upon request, make apply the rules and score the game. Each team makes decisions about what programming elements will engage the users. Special attention should be paid to:

1. Clarity on how to play the game.
2. How the persons should interact with the program.
3. The visual, auditory cues and special effects (e.g. animations, a sound clip when the dice are rolled).
4. The users should be able to play the game with each other over the internet.

The implementation of the dice game should involve two players at different locations using a keyboard or a mouse to play their turn. All projects should have the following elements:

1. A graphical user interface created using App Designer. You are not allowed to implement the project using Guide; submissions programmed with Guide will receive zero points without exception.

2. An animation.

3. A sound effect.

4. Make use of user-defined OOP class in at least one programming element.

5. One or more tables.

6. The capability to play the game between two, or more, players remotely.

7. **Clearly indicate in your code and your video where these elements are implemented. In your YouTube video, please point out how you implemented some features (especially in the Core and the Reach) inside your code. What functions did you use? Did you use any data structures such as structs etc? What was challenging about implementing a certain feature and why?**

Appendix

- MATLAB supporting files - zipped directory

Links to external resources:

- Controlling Random Number Generation
- Play Audio
- MathSoft Guide

Collaboration Policy: Once teams are formed you are only allowed to talk and collaborate with members within your team. Team members are expected to equally participate, and collaboratively work towards the completion of the project. Other than contacting the teaching assistants for clarification, you may not seek the assistance of other persons to complete your team's project. (Of course, general discussions about how to implement GUI, OOP and other programming constructs could be discussed with other students, but your team must be totally responsible for the implementation of code used in your project).

Grading Criteria: The projects are open ended. As long as your program can perform the assigned tasks, there will be no correct or incorrect approaches. Certainly there will be more acceptable and attractive solutions, and that will be judged in comparison with competing solutions submitted by your classmates. The final project will be graded in six parts:

1. ***Project proposal***: (10% of grade) Each team submits a 2-3 page via Canvas a project proposal describing the project, a general description of how you will implement the main components of your and a clear description of the Reach/Special features that your team proposes. Essentially, the scope of the project should be challenging enough to merit full credit and doable within the timeline. An Appendix should contain a breakdown of programming tasks, and who will be responsible for what, along with a timeline that will meet the submission deadline (we suggest you make use of a Gantt chart. The expectation is that each team member must take responsibility for a specific aspect of the project and grading for each member will be adjusted according to how the project tasks were delegated and who was responsible for what aspects of the project. The more specific you can be in defining the programming tasks, what functions should exist, and what each function should accomplish, the better.

NOTE: You must specify which dice game you are planning to implement (e.g., Yahtzee) and have the game approved by the project TA. For example, a game like Pig (https://en.wikipedia.org/wiki/Pig_(dice_game)) will not be approved because it is too simple.

2. ***Core***: (50% of grade) Complete the basic project as outlined in the project description.

For example: Show whose turn it is to play, an image background such as a green table, an image showing the dice roll outcome, the scores, etc.

- **Features of the GUI:**
  - Roll dice button
  - Display scores edit fields
  - Anything else you need or want to add depending on the game you have chosen.

3. ***Reach/Special Features***: (30% of grade) Implement the project enhancements described in your proposal. Your completion of the Core and the creativity of your proposal will be taken into account during the grading process.

- **Animations**
  - Rolling dice
  - Scoring system
  - Others
- **Sound**
  - Rolling dice
  - Scoring system
  - Others

4. ***Additional Core Requirement: Remote players and Tables****:*

- The GUI interface must include a table keeping a record of the rolls for each player throughout the game.

- The capability to play the game between two, or more, players remotely. *In remote play, data must be transferred bidirectionally between both players, i.e. there must be no difference in the gameplay between the players.*

5. ***Youtube Video Requirements*****:** (10% of grade) Youtube has several examples of ENG6 videos (search ENG6). The format of the video is entirely up to your team as long as the following criteria are met:

A. Maximum length of the video is 10 minutes

B. Each team member must be seen in the video to present their work and contributions

C. A clear and easy to follow demonstration that shows the correct functionality of your program (show you program actually working in the video – not screen shots of before and after.)

D. Explain how to use the data acquisition GUI, or how to play the game, in either a brief PDF document or in the Youtube video.

E. **Use visual aides to help explain your steps (whiteboard, markers, poster, etc.). The video does not have to be fancy, just effective in relaying the most important information.**

6. ***Team Evaluations***: Each member must provide a brief personal summary of her/his involvement and contributions. Each team member is required to submit evaluations of your and your teammates' contribution, one for each of Core and Reach. For example, if your team has members A, B, C, and D, your evaluation can be similar to the following for a single member. An example is shown below.

A: Team Member A was in charge of writing the code to execute to simulate a dice roll when a button was clicked. For the Reach, A was in charge of adding 5 different sound effects that could play when the user opens up a new game. Team Members B, C, and D agree that A performed these tasks for the project.

Project Deadlines:

Deadline #1: Monday, November 15, 2021 11:59 PM: **Submit the Project Proposal:** A team member must submit the project proposal to Canvas. Only one team member should do this!

The submission should also contain an image of the design view with the main components of your game. The image must show the buttons, axes, images, edit fields, etc.

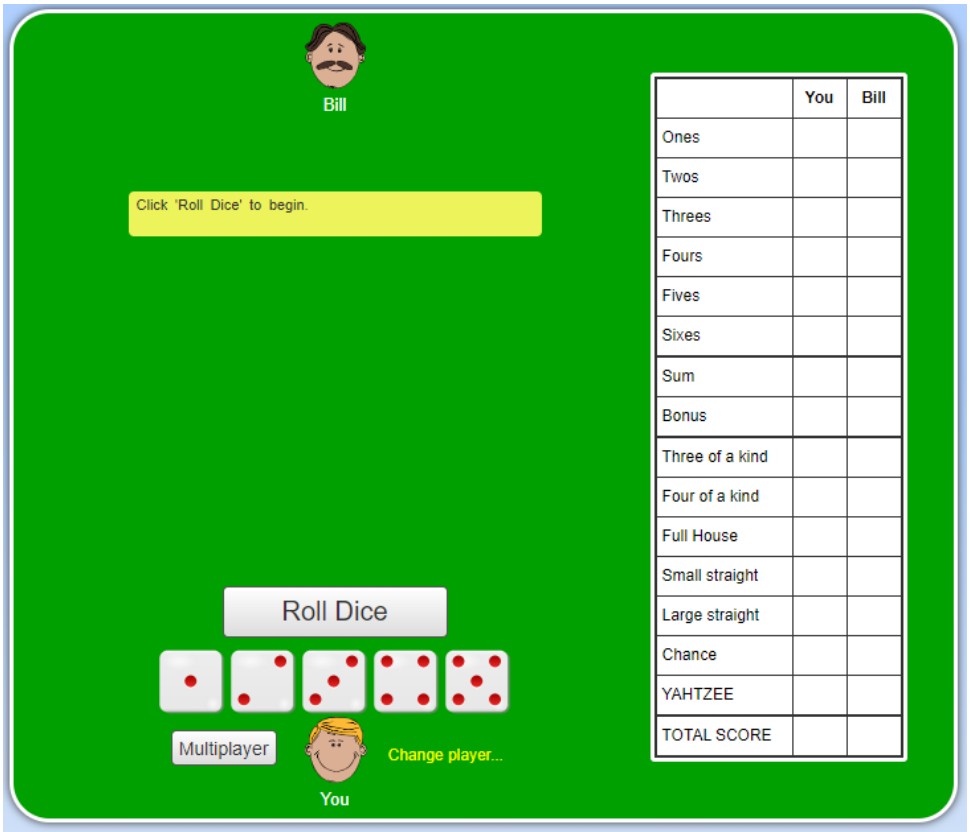

Figure. Example of a design view: Yahtzee dice game

Deadline #2: Monday, November 29, 2021 11:59 PM: **Submit the core**. Each team will submit all relevant code files. Each team will submit a zip file of all the code, the zip file will have the mlapp. and all .m files, all .img files and any other files that are needed for the game to run.

The submitted .mlapp must allow the game to be played by one or two players using the same keyboard.

Note: The UI components for the remote player locations and tables can be avoided in this stage.

Deadline #3: Friday, December 3, 2021 11:59 PM: **Submit the Final Project.** The final project must include the **Additional Core Requirements and the Reach/Special features:** Implement tables, remote locations and the project extensions described in your proposal.

Each team will submit all relevant coding files, a link to Youtube video and team evaluation materials. Each team will submit a zip file of all the code, the zip file will have all .mlapp files, all .img files and any other files that are needed for the game to run. In addition, it should contain a PDF of the team evaluation document. The link of the Youtube should be accessible to all those who use the link.