

SEIS 610 Project Deliverable #1 (100 Project Points)

Inception Phase (Project Kickoff)

Missing name!

1. Project Vision

In the second half 2019, Mission to the Moon (<https://mission-to-the-moon.com/>) will send two robotic lunar “rovers” to the moon to visit the historic Apollo 17 landing site. With this project we will *pretend* to be active participants in the lunar mission and write software to assist *pretend* pilots practicing the landing of a spacecraft on the moon. The project is also going to give pretend flight directors the capability of knowing who the best person to land spacecraft. The pilots will be able simulate landings multiple times and the flight director will be able to evaluate how they do.

2. Project Boundaries

- a. This is going to be written in 100% in Java so will NOT run on systems that don't support java.
- b. This will not simulate launching from Earth.
- c. At first it will only be PC based.
- d. It will never run on an iPhone.
- e. It will not be a real-time simulation.
- f. The app will expect a straight down drop, not an angle or other vector arrival.
- g. The application will not accept mouse or controller input at this time.
- h. The app will not support a GUI.

3. Requirements written as User Stories (30 points)

User stories are written in the style of “As a [type of user] I want [some goal] so I can [some reason]. Do not forget the “so I can” clause.

- a. As a pilot I would like to practice landing a spacecraft on the moon. (20 tomatoes) (missing so I can)
- b. As a pilot, I would like to be able to practice landing the spacecraft many times so that I can be good at it. (5 tomatoes)
- c. As a pilot, I would like to be able to keep track of my landings, so I can know if I am improving. (5 tomatoes)
- d. As a pilot, I would like to be able to see a graphic representation of the surface that I am landing on so that I can visualize how the landing is going. (20 tomatoes)
- e. As a flight director, I would like to be able to adjust the amount of fuel in the spacecraft before it arrives at the moon with so that I can see how adaptable my pilots are. (1 tomato)
- f. As a flight director, I would like to be able to change the weight of the spacecraft so that I can test various device configurations. (1 tomato)
- g. As a flight director, I would like to change the value of the gravitation pull so that my pilots can practice landing spacecraft on other planets, or the sun, (but only at night. ☺) (1 tomato)
- h. As a flight director, I would like to be able to set the final arriving altitude at the moon. (missing so I can, missing tomatos)

4. Business Case and Initial Cost Estimate (20 points)

- a. Project has a total of 53 tomatoes.
- b. We believe each tomato is worth 1.5 hours of labor.
- c. We believe our hourly rate to be at \$15.00 per hour, therefore cost of labor for the project will be \$1,192.50.
- d. Existing Software. It seems there is no commercial software compatible with this project. There is an abundance of free and open source software, including software with graphical capability.
- e. The current software available seems to simulate the Apollo landings. While interesting, they are too tightly coupled to the old mission and old equipment. If we want an adequate simulation, we will have to create a special one for this project.
- f. Business risks. Developers could be spending time on this project instead of a project that is more necessary for the group. It is possible nobody will want to use the software when it is ready. It is possible no return on investment is possible as it is so dedicated to this special mission we won't even be able to make a game of it.
- g. The project will only need a PC or two with Java. Maximum tool cost \$1000.00.
- h. **We have decided to build.** As stated before, nothing exists that is exactly suitable. Also, in spite of the business risks, there is one huge potential benefit. If this software assists in a successful mission, it will have saved millions of dollars of investment. Development costs of less than \$2000 plus the other business risks do not outweigh the chance for great benefit.

5. Technical Risks. (15 points)

- a. The software might not work properly **(bad risk, be more specific, why might it not work? What are you afraid of)**
- b. No experience editing, compiling, or building java programs.
- c. No experience outputting data from a java program.
- d. No experience inputting data to a java program
- e. No experience saving data in persistent storage.
- f. No experience processing data. **(be more specific, what data concerns you)**
- g. Limited number of engineers on team with a physics background.
 - i. We don't even know how to calculate decent of a spacecraft on the moon or any other planet.
 - ii. Writing the algorithm to calculate the decent without having an idea how to do it.
- h. No experience with programs with graphics. **(bad risk, the system is already defined to be text only)**

6. Non-functional requirements

[Non-functional requirements are how a system is judged when it is complete. If a system is specified to be secure, specify a non-functional requirement indicating security. Remember, non-functional requirements can form the basis of functional requirements.]

- a.** As a flight director, I want an accurate program for training my and evaluating my pilots so I can be sure they will not crash the device landing.
- b.** As a flight director, I would like the program ready before the real device approaches the moon (September 2020) so I can train before it is pointless to train..

7. Glossary.

- a.** Flight director: Person in charge of all parties in the mission.
- b.** Pilot: Person flying and landing the spacecraft.