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Good project theme, nice description
of features to develop.

Roles, timeline as less clear.

Linearity of project could be less strict.

We are going to be creating a game in OpenGL, and will likely need an organizational structure to ensure everything is getting done on time and in the correct manner. We will have a couple different tools that will keep us on track. We have a Google Drive folder that will house all of our documentation and files that would interact poorly with version control software like git. This is where we write progress reports and keep short lists of ideas/plans. The code will all be kept in a private GitHub repository, and we will push to the master branch after large pieces of code are finished. For communication, we have a basic SMS group message. This is relatively low tech, but it works quite well for us because of the ability to send links and small files, and allows us to plan meetings and discuss ideas briefly.

The goal of our project is to create a 3-dimensional version of the classic minesweeper game, mapped around a cube. The player will select tiles by aiming and firing a projectile at the cube, and when the projectile hits it will cause the cube to spin. The player will also be able to rotate the cube by pressing down arrow keys. If we succeed in making all of these elements of the game work well, then we will extend the project by adding new shapes to play with and coming up with new ways to interact with the shape.

We plan to have each member actively involved in coding, and roles will likely shift during the process depending on what specific tasks need to be accomplished. We will also select a member of the team each week to quickly summarize what the team accomplished that week and add it to our github repo so that we maintain a clear record of what we have accomplished. As of right now our plan is to have Alex focus on creating and implementing the game rules, Trey work on creating the cube and its physics, and have Drew create the environment.

The project we have chosen is fairly large, but we believe we will progress fairly linearly through our tasks. We expect to have all of the git repos and personal environments completed by the end of this week. Each person will be responsible for their own environment, although we will collaborate to ensure that important settings are preserved when someone is working on a piece of the project. Our next step will be establishing the basic cube object. This will likely take some time, as none of us have produced 3D geometry in OpenGL. After the cube exists in the 3D space, we will begin to interact with it with spinning physics. We want the cube to rotate when arrow keys are pressed, and the longer the key is held down the faster the cube will spin. At this stage, we will also establish our basic environment and camera settings.

At the same time as we are working in 3D space, someone will be working on reimplementing the rules of Minesweeper in OpenGL, accounting for anomalies that don't exist in 2D Minesweeper, like corners. The rules of the game will be very similar to that of traditional minesweeper, where bombs are hidden in some of the tiles and each tile without a bomb will show a number indicating how many bombs are adjacent to that tile. Our 3D version will treat tiles that share a corner as adjacent, and that will extend around faces. The rules themselves will not be very complicated, but implementing them in a new framework may take some time. After the cube and Minesweeper rules are created and debugged, we will begin implementing Minesweeper on the surface of the cube. This includes minor texture work and implementing

Don't leave
roles so loose.
Lay out the
tasks & subtasks
you need to
accomplish, and
assign them to
people.

Good details
about features.
How do they
map into your
individual share
effort? Who
will work in
which parts?

*Good progress
of dev 15. Leave
more room for
optimization like
this.*

clicking functionality to actually interact with the game. This is also the stage where we will fully test the game rules of Minesweeper. At this point, we will have our first rough product.

*However need
to start the
development phase
into the time line
(not just the
milestones).*

After this first stage is completed, we will then begin to replace clicking on the Minesweeper tiles with projectiles that will be launched from the perspective of the camera. These objects will be given basic projectile physics so they reliably hit the intended area while still preserving some challenge. When the projectile impacts the cube, the cube should respond in a realistic way that is dependent on where the projectile landed and from what angle. At this stage we will need to implement inertia and play with the settings to get the most satisfying result possible. Once we have these pieces put together and functioning as intended, we will be able to begin attaching finishing touches and UI improvements. We could potentially add additional features and settings to allow the user to tweak the experience if we have enough time at the back end.

Timetable:

- Plan our document, set up all necessary environments and git repos - 2/14
- Generate a cube and set up some basic spinning - 2/27
- Create our game board and map it onto the cube, allow for some basic interaction via clicking - 3/12
- Develop an aiming and shooting mechanism, and have the cube react - 4/2
- Finish the shooting and cube physics, create a scoreboard - 4/16
- Finishing touches, README with instructions for how to start and play - 4/23

*How can you
make your development
less linear? Try
to parallelize tasks over
your team at
least somewhat.*

We plan on using git to collaborate on our project, and that will help us manage risk in many different ways. We will be able to roll back any changes if something goes wrong, and we will always have a copy of our project. Git will also help us to ensure that any changes we make are not detrimental to another part of the project. If for some reason we lost a team member, we would likely have to scale back our design somewhat. We would still focus on achieving our main goals of creating the game on a cube and making the cube responsive, but we might abandon trying to make other shapes besides cubes and make our physics less precise. By keeping track of our process as a group and frequently committing our work to github, however we can hopefully make ourselves better prepared to pick up where our team member left off. In order to make our game easier to look at and play, we will make sure all the colors we use are highly contrasted and that the important aspects of the game, such as the numbers on the tiles, are very easy to read. We will also work to minimize any unnecessary movement or effects that could be distracting or could attract someone's gaze.

*Okay makes
sense.*

Our program will be implemented entirely in Java using OpenGL, and will therefore be fairly portable. Ideally we will not need to go through an extensive installation process, and are not expecting to interact directly with the user's environment. The project will likely be distributed as a zip containing the core .jar file and a README explaining the project's purpose, and potentially some basic information about the team. The README may not be necessary, depending on how much of the information is able to be neatly contained in the game itself. The

internals of the jar file will be viewable by unzipping the jar, and the code will be extensively documented for clarity and easy reading.

This game will require no training, as any good computer game should. Instead, the controls will be shown to each player as the game boots up, and will potentially be available in one of the corners so the user doesn't forget. OpenGL appears to have cemented itself as an industry standard, so we are expecting that the core features of it will remain functional and accessible for some time. Other than OpenGL and the current version of Java, the program should only rely on assets stored internally and shouldn't need any maintenance.

Basic evaluations of our project will be simple because it is very visual and interactive. Our initial evaluation will come from whether or not we achieved the basic goals that we set for the project. We will evaluate if our game is a playable version of minesweeper that involves rotating the cube and firing at tiles to select them. After each milestone in our timetable we will assess whether or not our project in its current state meets the objectives we layed out, and how easy it is to use and interact with. As the project progresses into its final stages we also plan to have some other testers play our game. We will ask them to evaluate how easy it is to do things like aim, shoot, and rotate the cube, as well as how easy it is to understand the rules and how the game works.

(You evaluate to game by asking them things about it.)

Should we continue our project after the deadline, we would add features that would add more variety and depth to our game. Instead of simply using a cube, we could have several 3D objects that the play could choose to play on. We could also add several difficulty settings, just like the traditional minesweeper. A system could be added to track highscores, and some visual customization options could be added such as the ability to change the color of the surface or the background.