Parchment

Sprint #1 Planning Document

Team 12
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Sprint Overview

During Sprint 1, our goal is to create a working, but not yet fully fledged, GUI that allows users to create and manage their game projects. We also aim to begin development on the codebase behind the game editor and the game virtual machine, with an emphasis on parsing and storing data as well as rendering the game itself, albeit in a rudimentary fashion for sprint 1. Most of the *editing* of game projects (including sprite editing, audio editing, and map editing) will not be implemented in sprint 1, aside from very basic editing features involving pages. Instead, the creation, storage, and interpretation of game projects and data files will be focused on in this sprint to ensure we have a good technical foundation for our engine in subsequent sprints.

Scrum Master: Jacob Brown

Meeting Plan: Wednesdays/Saturdays 8:00 pm

Risks and Challenges

Given the limited time constraint of the sprint, one of our team's biggest difficulties to overcome will be bringing all the separate engine components together and ensuring the resulting product is functional. There are a myriad of dependencies present in the game engine; for example, the GUI depends on our algorithms to be developed correctly in order for buttons and user input to function as intended. It is vital that core parts of the engine are functional and all members must have a thorough understanding of their roles to ensure their code meshes well with others once code is merged.

Current Sprint Detail

<u>User Story #1</u>
As a user, I would like to create a new game project.

Task #	Description	Estimated Time	Owner
1	Develop file menu/dropdown for opening existing projects or creating new projects.	3 hrs (each)	Jacob, Drew
2	Create a button to create a new game project.	1 hr	Jacob
3	Create a function to initialize a new game object.	1 hr	Jack
4	Create a prompt asking the user the name of their game and where the game data file should be saved.	2 hrs	Drew
5	Save new game data file in the requested location.	1 hr	Jack
6	Add unit test for game creation functionality	3 hrs	Jack

<u>Acceptance Criteria:</u>
1. Given that the initial menu of the game engine is implemented properly, when the engine opens then a window with a button to create a new project should show up.
2. Given that the file selection window is implemented correctly, when the user selects a location to save their game data file then the game data file is saved there and the location is kept for future game data saving.
3. Given that the file creation API is implemented correctly, when the user creates a new project then a folder is created where the user specifies with the game data file inside.

<u>User Story #2</u>
As a user, I would like to import a game project file so that I can continue developing.

Task #	Description	Estimated Time	Owner

1	Create a function to parse the game data file into game data objects.	15 hrs	Larry
2	Create a button to open the import project window.	1 hr	Drew
3	Create a window to select a game data file to import.	2 hrs	Jacob
4	Add unit test for game importing functionality	3 hrs	Larry

Acceptance Criteria:
1. Given that the initial menu of the game engine is implemented correctly, when the engine opens then a window with a button to import a new project should show up.
2. Given that the file selector window is implemented correctly, when the user opens the import file menu then the user can navigate directories and choose the desired project to import.
3. Given that the file parsing function is implemented properly, when users import a project then the project successfully loads and gets stored in memory for editing.

User Story #3
As a user, I would like to save a game project so that my work progress is kept.

Task #	Description	Estimated Time	Owner
1	Create a button to save the existing game project.	1 hr	Jacob
2	Create a function to serialize and save the current game data object as a game data file.	15 hrs	Jack
3	Add unit test for game saving functionality	3 hrs	Jack
4	Create a prompt that asks users "are you sure?" if they decide to exit the engine with unsaved changes.	2 hrs	Drew

Acceptance Criteria:

1. Given that the serialization function is implemented correctly, when the user saves a game project, then an accurate game data file that represents the full data of the game being edited should be created.
2. Given that the save button is implemented correctly, when a user decides to save their project, the game data file should be saved to their disk.
3. Given that the save prompt is implemented correctly, when the user attempts to close out of the project with unsaved changes then the engine will prompt the user to save their changes.

User Story #4
As a user, I would like to delete a game project.

Task #	Description	Estimated Time	Owner
1	Create a prompt asking the user "are you sure?" if they decide to delete their existing project.	2 hrs	Jacob
2	Create a function to delete the game data file associated with a project and free remaining game objects	1 hr	Larry
3	Add unit test for game deleting functionality	1 hr	Larry
4	Create a prompt that tells users a project was successfully deleted.	2 hrs	Drew

Acceptance Criteria:
1. Given that the delete prompt is implemented correctly, when the user attempts to delete the project, then the engine will prompt the user with a confirmation message
2. Given that a user clicks "delete project", when the engine finishes deleting the file, the user will be presented with a success message.
3. Given correct implementation of deletion, when the deletion process finishes, there will be no deletion-related memory leaks

User Story #5
As a user, I would like to view the game's object structure and pick the component that I want to view/edit.

Task #	Description	Estimated Time	Owner
1	Create the necessary functions to map out the parent-child hierarchy for game components (maps contain tiles, lots of components have sprites, etc)	8 hrs (each)	Jack, Larry
2	Create a project explorer widget that shows the components added to the current project and allows users to select and view specific game components.	4 hrs (each)	Jacob, Drew
3	Create a function to set the currently selected component in the object tree to the desired one to view.	2 hrs (each)	Jacob, Drew

Acceptance Criteria:
1. Given the component hierarchy functions are correctly implemented, when the object explorer is open, the widget will display a listing of game components in the project, with children components being correctly ordered under their parents in the hierarchy.
2. Given correct hierarchy implementation, when components are being selected to different components, then type-casting errors will be prevented
3. Given a correct select function implementation, when objects in the objective tree are selected, then they will be highlighted

User Story #6
As a user, I would like to run my game.

Task #	Description	Estimated Time	Owner
1	Create an game data file parser that recreates the exported game data from the editor	2 hr	Larry
2	Create a game loop that renders objects	7 hrs (each)	Josh, Raymond
3	Create a game loop that	7 hrs (each)	Josh, Raymond

	calculate the logic		
4	Implement clock to time certain operations differently (ticks)	2 hrs	Josh
5	Handle keyboard inputs	1 hr	Raymond
6	Add unit test for importing game	3 hrs (each)	Josh, Raymond

Acceptance Criteria:
1. Given that the game data file parser is implemented correctly, when the user starts the game then the game components read into memory will match what is exported from the editor and the game will begin the game loop and rendering.
2. Given that the renderer is implemented correctly, when the game loop finishes rendering the map and all entities, then the screen will match what is shown in the editor
3. Given that keyboard inputs are correctly handled, when a user presses a key-bound key, a callback function is triggered to perform pre-programmed functionality

User Story #7
As a user, I would like to create and edit a "page" of my game.

Task #	Description	Estimated Time	Owner
1	Create a widget window for displaying game components.	2 hrs	Jacob
2	Create a function that renders the currently selected component in the display widget window	5 hrs (each)	Josh, Raymond
3	Create a widget window that lists all available components	5 hrs	Josh
4	Create a function that adds currently selected component to the "page"	2 hrs (each)	Josh, Raymond

Acceptance Criteria:
1. Given that a widget window and displaying function setup are corrected, when the user selects a component from the object tree, it should be displayed.

2. Given the widget window is set up correctly, all available components should be displayed to the user.
3. Given the function that adds a currently selected component to the page is functional, if a user selects a component, they should be able to add it to the page of their choice.

User Story #8
As a user, I would like to resize the Parchment window responsively so that I can use it on any size of monitor.

Task #	Description	Estimated Time	Owner
1	Ensure that all objects in the Parchment window scale correctly when the window is resized.	2 hrs	Jacob
2	Ensure Parchment, when reopened, opens on default resolution settings.	2 hrs	Drew
3	Ensure all objects in the Parchment window are in their correct position when a window is dragged around the screen.	2 hrs	Drew

Acceptance Criteria:
1. Given that the resizing functionality is implemented correctly, when the user has opened Parchment and opts to resize the window, the Parchment engine should respond by successfully resizing.
2. Given that the minimization/maximization functionality is implemented correctly, when the window is maximized or not maximized then objects in the Parchment window should be scaled as necessary, alongside the window being resized.
3. Given that resizing is implemented correctly, when the window is resized by the user then objects in the window should respond correctly to resizing by retaining their in-window positions.

User Story #9
As a user, I would like to bind different mouse controls so that I can make mouse controlled games.

Task #	Description	Estimated Time	Owner
1	Bind mouse key to a callback function	1 hr	Raymond
2	Implement the functionality of the mouse key input callback function	2 hr	Raymond
3	Create functionality to change mouse callbacks dynamically, which happens when the users change the mouse settings	2 hr	Raymond

Acceptance Criteria:
1. Given that the requested keys to be key-bound are legitimate keys, when the mouse is being initialized for use, the mouse will correctly call its callback function upon a key-bound press
2. Given that a mouse key has been correctly bound to a callback function, when the key is pressed, then the bound callback function will run in its entirety and produce the expected result
3. Given that mouse key-press callbacks are correctly implemented, when a user changes the current callback function, then the new keybindings will be updated and will produce the expected result depending on the new callback function.

User Story #10
As a user, I would like to open and close Parchment natively on a Windows OS so that I can use the game engine.

Task #	Description	Estimated Time	Owner
1	Create a thorough GUI mockup (layout, color scheme, etc).	4 hrs (each)	Jacob, Drew
2	Set up OpenGL/SDL2/IMGUI environments.	3 hrs (each)	Jacob, Drew
3	Create a window that opens on engine start, including most recently worked projects.	2 hrs (each)	Jacob, Drew
4	Ensure the main window and all sub-windows close successfully.	1 hr	Jacob

Acceptance Criteria:
1. Given that the Parchment application is runnable, the application should launch when it is executed.
2. Given that Parchment launches successfully, a user should be able to "X" out of the window to close the application.
3. Given that implementation of application closing is correct, all sub-windows inside the program should close as well.

User Story #11
As a user, I would like to change the name of an existing game project so that I have flexibility with naming.

Task #	Description	Estimated Time	Owner
1	Create an option that allows users to change the name of their existing game.	1 hr	Jacob
2	Create a prompt for the new name of the game and the file location to save it in.	1 hr	Drew

Acceptance Criteria:
1. Given an existing Parchment project, a user should be able to select a rename project option.
2. Given an existing Parchment project, if a user enters a new name, the program should rename and refactor (if necessary) the project.
3. Given an existing Parchment project, if a user cancels the rename, the name should not change.

Remaining Backlog

Functional

1. <u>Subsystem Editor General</u>
   a. I would like to change Parchment settings (game res, framerate, Vsync, color scheme, fullscreen) so that I can configure it to my preference.
   b. I would like to view a Parchment splash screen so that I can see startup progress.
   c. I would like to have my game assets loaded and rendered by Parchment so that I can focus on game development.
   d. I would like to be able to view all assets associated with a game project so that I can manage them.
   e. ~~I would like to name/create a new game project so that I can start developing.~~
   f. ~~I would like to import a game project file so that I can continue developing.~~
   g. ~~I would like to view my existing list of projects so that I can continue developing.~~
   h. ~~I would like to save a game project so that my work progress is kept.~~
   i. ~~I would like to delete an existing game project and associated files so that I can manage projects.~~
   j. ~~I would like to change the name of an existing game project so that I have flexibility with naming.~~
   k. ~~I would like to export my game project so that I can release the game.~~
   l. ~~I would like to resize the Parchment window responsively so that I can use it on any size of monitor.~~
   m. I would like to rearrange and resize docked views so that Parchment can better suit my workflow.
   n. I would like to be able to undo and redo actions so that I can fix mistakes.
   o. I would like to use UI hotkeys so that I can more efficiently navigate the interface.

2. <u>Object Tree Viewer</u>
   a. ~~I would like to access an object tree view so that I can view all objects in the project~~
   b. ~~I would like to list all the component in the game in the object tree~~
   c. ~~I would like to click any component to view and edit it in the corresponding editor~~

     d. I would like to fold and unfold components to unsee or see their child components.

3. <u>Page Editor</u>

   ~~a. I would like to access a page editor view so that I can edit maps.~~
   ~~b. I would like to make a new page in the editor.~~
   ~~c. I would like to place and delete entities on the page.~~
   d. I would like to have control over the camera on the page.
   e. I would like to list all the pages created in the game.
   f. I would like to delete a page.
   g. I would like to view and edit the description of the current page.
   h. I would like to add a script to a page.
   i. I would like to make a special kind of page as a menu page for menus.
   j. I would like to make a special kind of page as a setting page to let users configure their game.
   k. I would like to make a special kind of page as a HUD page that displays information above other pages.
   l. I would like to make a special kind of map page that contains a series of maps.
   m. I would like to make a special kind of page that uses script and entities with camera control to create cutscenes.

4. <u>Map Editor</u>

   a. I would like to access a map editor view so that I can edit maps.
   b. I would like to create a new map and edit it in the editor so I don't need to already have an existing map.
   c. I would like to list all the maps created in the current map page
   d. I would like to select a map as current and associate it with another editor widget.
   e. I would like to view and edit the description of the current map.
   f. I would like to import an existing image or map so that I can bring in outside assets.
   g. I would like to delete an existing map so that I can manage maps.
   h. I would like to edit map properties such as size so that I can have different map types.
   i. I would like to add a tile from the tile editor to the current map.
   j. I would like to put entities on the current map.
   k. I would like to add scripts to the current map.

5. <u>Entity Editor</u>

a. I would like to access an entity editor view so that I can edit sprites.
b. I would like to create a new entity on the current map.
c. I would like to list all the entities of the current map.
d. I would like to select an entity as the current one and associate with other editor widgets.
e. I would like to view and edit the description of the current entity.
f. I would like to add statuses to the current entity.
g. I would like to associate a prototype to the current entity.
h. I would like to add sprite to the current entity.
i. I would like to delete an existing entity.
j. I would like to edit existing entities (on the map or otherwise) so that I can iterate on item design.

6. ## Prototype Editor
   a. I would like to access a prototype editor view so that I can edit sprites.
   b. I would like to create a new prototype.
   c. I would like to list all the prototypes.
   d. I would like to select a prototype as the current one and associate with other editor widgets.
   e. I would like to view and edit the description of the current prototype.
   f. I would like to add a script to the prototype.
   g. I would like to edit the attribute of the prototype.

7. ## Status Editor
   a. I would like to access a status editor view so that I can edit statuses.
   b. I would like to list all statuses defined in the project.
   c. I would like to select a status and associate it with another editor widget.
   d. I would like to create a status in the status editor.
   e. I would like to view and edit the description of the current status.
   f. I would like to add a sprite to a status.
   g. I would like to edit the effect of a status.

8. ## Sprite Editor
   a. I would like to access a sprite editor view so that I can edit sprite.
   b. I would like to list all sprites I have made so that I can easily manage them.
   c. I would like to edit existing sprites so that I can iterate on sprite design.
   d. I would like to create a sprite.
   e. I would like to use basic pixel manipulation tools (pencil, fill, eraser, etc) so that I can edit sprites.

f. I would like to change the pixel color and use a color picker so that I can create colorful sprites.
g. I would like to create simple animations so that my sprites have motion.
h. I would like to use selection tools so that I can move, copy, and paste sprites in the editor.
i. I would like to import an image for a sprite so that I can bring in outside assets.
j. I would like to delete an existing sprite.
k. I would like to use multiple layers so that I can create more complex sprites. (time permitting)

9.   Logic Editor
a. I would like to access a logic editor view so that I can edit statuses.
b. I would like to list all the logics in the project.
c. I would like to choose a logic as the current one and associate it with other editor widgets.
d. I would like to create a logic.
e. I would like to add targets to the logics.
f. I would like to add a special logic target to achieve a special result like ending the game if an objective is reached so that the game can be beaten.
g. I would like to make customized logic targets so that I can make different kinds of interactions between game components.

10.   Script Editor
a. I would like to access a script editor view so that I can edit scripts.
b. I would like to create a script in the script view.
c. I would like to list all the scripts in the project.
d. I would like to delete a script.
e. I would like to choose a script as the current one and associate it with other editor widgets.
f. I would like to add movements to the current script
g. I would like to add actions to current script
h. I would like to add signals to current script
i. I would like to view and edit the description of the current script.
j. I would like to be able to define player interactions in the script so that I can implement interactivity.

11.   Control Editor
a. I would like to access a control editor view so that I can edit scripts.

    b. I would like to change settings for player controls so that I can have custom controls.

    c. ~~I would like to bind different mouse controls so that I can make mouse controlled games.~~

    d. I would like the option to define controller/gamepad bindings so that the game can be played with a gamepad. (time permitting)

    e. I would like to map controls to script so that I can control their movement.

    f. I would like to add event listeners to keys so that the player can trigger scripts.

12. Audio Editor

    a. I would like to access an audio editor view so that I can edit audio.

    b. I would like to import audio for items/sprites so that I can have specific audio tied to game objects.

    c. I would like to import audio for music so that my game can have a soundtrack.

    d. I would like to view and delete audio so that I can manage audio assets.

13. Networking Editor

    a. I would like to access a networking editor view so that I can edit scripts.

    b. I would like the option to implement local co-op so that I can create more types of games. (time permitting)

14. Game Virtual Machine

    a. ~~I would like to run the game (executable) using the game VM so that I can try the game.~~

    b. ~~I would like to let the virtual machine read and parse the game file.~~

    c. ~~I would like to let the virtual machine render the game pages.~~

    d. I would like to let the virtual machine play the in-game sound.

Non-Functional

1. Usability

    a. ~~I would like to run Parchment natively on a Windows OS.~~

    b. I would like to view in-application tutorials or documentation so that I can learn the features of the engine.

    c. As a beginner user, I would like to have documentation readily available to assist and streamline development.

d. As a beginner user, I would like to be able to create a game entirely from the graphical user interface, with no programming needed.

2. Testing
    a. I would like to launch a game instance *using Parchment* so that I can test & debug the game.

3. Source Control
    a. I would like to enable source control so that I can manage different versions of my game. (time permitting)

4. Expandability
    a. I would like a system to write and execute my own C++ code so that I can extend Parchment's basic capabilities.

5. Performance
    a. As a user, I would like to develop games that can run within the 30-60 FPS range at minimum.
    b. As a user, I would like the engine to run with optimized resource usage.