Project Scope Statement Document

# GENERAL INFORMATION

Project Name: 2-D interactive game Project Number: PR232399

Manager Name: Joe Spurway Contact information: [jspur720@mtroyal.ca](mailto:jspur720@mtroyal.ca)

## Project Overview

This project aims to fulfill the functional and documentational progress of a 2-D 9-hole mini-golf game [Mini Golf] from a top-down perspective. Mini Golf provides the user with the ability to control the angle of a putting ball (char ‘A’ or ‘D’) and power of their shot (char ‘W’ or ‘S’) and take their shot by pressing the enter key ( char ‘LF’ ) . To signify the angle's position changing relative to the ball, a directional line will be used that implies the direction the ball will travel. Following this, we will use a graphical power bar to visualize the output power of the shot. Obstacles are placed on the map in the form of surface terrain changes and portals/redirects. Surface terrain changes, changing the speed of the ball lowering the power of the moving ball. Portals teleport the ball to another area on the map. The ball leaves the portal with the same power and angle that it entered the portal with. The perspective of the game takes a bird’s eye view of course, where the user can see the whole map and all its features to accurately calculate their next shot. The goal of the game is to get the user’s ball into the putting-hole at a defined position on the map in the least amount of turns possible. The reason this project is being undertaken stems from the term capstone project of Computing Machinery II course at MRU, as a high-level time estimate we aim to be completed by April 14th.

## PROJECT OBJECTIVES

These projects' objectives are to implement this assembly language game first within a C programming language framework and then convert it into assembly language. This will increase the likelihood of successful completion as translation from C to 68k is much easier than writing directly to Assembly language. Each implementation will have to fulfill testing criteria outlined in product testing. Each time bound phase of the project will have measurable testable functions to insure accurate specific predefined results.

## Project REQUIREMENTs

The projects must satisfy the following comprehensive requirements:

|  |  |
| --- | --- |
| Provision of Low-Level Plotting Routines | Develop some or all of the following low-level routines as needed:   * clear screen and/or clear region * plot pixel * plot horizontal line * plot vertical line * plot line (generic) * various plot “shape” routines (where shape is something like square, rectangle, polygon, etc.) * plot bitmap (multiple variants, e.g., for different bitmap dimensions) |
| Game-Independence | Raster graphics library must be independent of the game, in the sense that the library’s design will not be coupled to game rules, object types, physics, events, etc. |
| Test Driver | Graphics library must be accompanied by a “test driver” program which invokes and thoroughly exercises each of its plotting routines. |
| Model Data Structures | Data structure(s) for representing the game world |
| Object Behavior Functions | For each object type has a set of behaviors functions |
| Event Handler Functions | Event handler functions which update the model’s state for each synchronous, asynchronous, and condition-based game event. |
| Test Driver | Verify the model implementation, including event handling. |
| Renderer module | Render object function for each type of object which can appear on-screen. |
| Test Driver | test driver programs which help verify your renderer implementation |
| Minimizing Screen Plotting | Improving the renderer so that it only re-plots the aspects of the model that have changed since a previous invocation |
| Main Game Module | The main game module must contain game initialization code, as well as the main game loop |
| Input Module and Three-Level Design | The middle layer will contain the “high-level” input routines needed by the game, these in turn call the “low-level” input routines provided by the operating system. |
| Double Buffering | Double buffering must be implemented correctly, with absolutely no flickering or tearing. |
| Music and Sound Effects | implement a low-level PSG library   * Create music * Create sound effects |

## Exclusions from the scope

This project is scoped within the range of a Computer Science Capstone project. Its development is dependent on a few key points, hardware, design, and timeline. Being limited to an ATARI 68000 computer our range of choices for game development was limited to low level design focused on improving fundamental skills then to that of a complex video game. Our scope therefore stays with a 2-dimensional monochromatic screen environment as development of a 3-dimensional platform within this context will be outside of the timeline we are offered within the course schedule.

## RESOURCE COSTS AND Time ESTIMATES

Costs are limited to labor time for project development as all hardware will be provided by the university.

Time estimates:

Stage 1: January 31st

Stage 2: February 8th

Stage 3: February 15th

Stage 4: March 1st

Stage 5: March 8th

Stage 6: March 16th

Stage 7: March 22nd

## ROLES AND RESPONSIBILITY

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| --- | --- | --- | --- |
| Name | Role | Responsibility | Signatures |
| Joe Spurway | Project Manager | Co-ordinate project timeline and resource management - assist with implementation | J. Spurway |
| Soren Bradley | Tech Lead/  Functional Manager | Help design, implement, and test all aspects of the game’s development |  |
| Paul Pospisil | Instructor/Project Sponsor | Assist in high-level guidance of game development life cycle |  |
| Steve Kalmar | TA/ Knowledge Supplier | Assist in lower level, more persistent issues. |  |
| Jordan Pratt | TA/ Knowledge Supplier | Assist in lower level, more persistent issues. |  |
| Library | Study Space/ Knowledge Supplier | Provide a safe, clean space to convene when vertical, COVID safe, communication isn’t an option. Assist with research as needed. |  |
| IT Department | Software access | Provide access to and assistance to relevant software needed for the project. |  |

## Assumptions

Enrolled within computing machinery course.

Access to some form of computer with capability for hosting a virtual machine.

Tools selected – programming IDE, sharing protocols like Git, access to remote server.

Project timeline and workload is strategically balanced.

Detailed project reporting.

## Product acceptance

Product meets all specifications outlined in the scope of the project.

Project structure is well designed, and documentation clearly outlines the necessary details for the game.

## Constraints

The main limit of this project is time as we are limited to one semester for its development.

## Signatures

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| --- | --- | --- |
| Name | Role | Signatures |
| Joe Spurway | Project Manager | J. Spurway |
| Soren Bradley | Tech Lead/  Functional Manager |  |
| Paul Pospisil | Instructor/Project Sponsor |  |