A-Level Computer Science

“Metal Lynch”

Programming Project

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# Analysis

## Problem Identification

I am going to be developing a 2d, multiplayer, turn-based strategy game where players play as tanks, that I am calling Metal Lynch. The aim of the game for each player is to reduce their opponent’s health to zero, and this may be accomplished by aiming their tanks cannon to shoot at the other player’s tank. It will take multiple hits to accomplish this, and so players are able to move their tank a limited distance each turn, in order to position themselves.

They will be able to select from a range of maps at the start at the game, and craters will be added dynamically to the map floor when a player’s projectile hits the floor. The player will also be able to pick from a range of projectiles to shoot at their enemy, each with varying properties such as damage and weight. This variety will help make the game more replay-able, as it won’t get boring and repetitive.

The game I am making is heavily inspired by a game called Shellshock Live, but will be different in some key ways (There will be a more in depth comparison between this game and the game I am making in the research section of the analysis). I plan on making my game a lot simpler, as it will not include items, and will have a smaller range of weapons and maps to choose from. This will help me make the GUI (Graphical User Interface) a lot simpler and more user friendly, which I am hoping will make the game more attractive to beginners, but also not oversimplify the core of the game.

I am also planning on creating a unique game aesthetic that contrasts greatly with Shellshock Live’s. Where Shellshock Live takes a more abstract design for the map, game objects and GUI, with heavy usage of vector graphics for the map and tanks, I am planning on giving it a more vivid design, where I will give the tanks and GUI a greater sense of realism. I am going to be using imagery of real, modern day tanks to inspire how I design the tanks and GUI, however I will not overcomplicate the design so that the core gameplay is not convoluted, and so that the game runs at a high enough framerate to be fluent (I am aiming for around 30 frames per second).

In order to ensure that the game I am making is entirely solvable through a computational approach, I will justify how I will make the game using the 5 computational methods that I think are relevant.

### Thinking Abstractly

Abstraction is where a real life system is studied, so as to remove details and attributes that are unimportant to the problem being solved. This leaves only the relevant parts of the system that can be used to solve the problem computationally. For my project I will be studying the physics system under which tanks and projectiles follow in real life, and abstracting from this system for my game.

The first major difference between Metal Lynch and real life is that real life is 3 dimensional, whereas Metal Lynch is 2 dimensional. This is an easy abstraction to make from real life, because from now on when studying how projectiles and tanks work in real life, all we have to do is only move these objects in the X and Y plane, allowing us to completely ignore the Z plane.

Another big abstraction that I will make is when it comes to the trajectories of projectiles. Again, we will be ignoring the 3rd dimension in real life in order to model trajectories in real life. In Metal Lynch there will be a total of 3 forces that may act upon the projectile; gravity, wind resistance, and the initial force of from the tank cannon. These will all be constant forces acting upon the projectile, which is simplified from real life where some of these forces such as wind resistance would not be constant, and could change while the projectile is in mid trajectory.

The last major abstraction that I will make is when it comes to the craters that projectiles will leave in the map. In real life these craters will vary hugely depending on the size and force of the projectile, and will likely not be perfectly circular. I will be heavily simplifying this by assigning certain crater sizes and shapes to certain weapons. This means that the crater generation will not take into account the size and force of the projectile, but will be predetermined by the weapon being used.

### Thinking Ahead

Thinking ahead is where

## Stakeholders

I have chosen three stakeholders who have an interest in my project. These are Jack Kench, Daniel Matthews and Sebastian Roffey. I have chosen these because they are good friends who enjoy local multiplayer gaming. They are familiar with the turn-based strategy game genre but are looking for something new that will give them more control over the game experience through modifiers.

My game is intended for teenagers and older, primarily male, who are looking for casual fun with friends. I chose my stakeholders because they are within the intended age group (both are 17), are of the male gender, and they enjoy playing local multiplayer strategy games, giving them enough experience to be able to give constructive criticism that is reflective of how they enjoy local multiplayer gaming.

They are interested in my project because they enjoy the game genre, but feel like there is a gap in the market. They are looking for a turn-based strategy game that is not overly complicated, making it easy to understand and play with very few instructions, but also not so simple that it gets boring quickly. Only one of my stakeholders is familiar with the game that has inspired my project (Daniel Matthews) but he feels that this game doesn’t allow for enough customisation of the game experience. He is looking for a game that has more modifiers that can be changed that effect the physics of the game: e.g. the ability to change the gravity that pulls down on projectiles, or the amount of health the player starts with. I intend to fill this hole in the market with my project.

I believe that they will be useful in helping me achieve the best possible solution because they have experience with similar games in the genre, and so will know roughly what to expect of a game in this genre. They are also interested in playing this with other friends who are inexperienced in this genre, and so will be looking to judge the ease of use and the simplicity of the design of this game. All of this means that they will be able to provide useful feedback that will help me achieve the best possible solution.

One final note is that one of my stakeholders is dyslexic (Sebastian Roffey) and requires that I add different colour options to the game to increase the ease of use for him. This makes him an especially useful stakeholder because he will be able to provide feedback that will help me ensure that the game reaches its widest possible audience, and doesn’t drive away people who are dyslexic.

## Research

As previously mentioned in the problem identification, my game is heavily inspired by a game called Shellshock Live. This game is available for purchase to download and play locally, but also has a similar, slightly simplified sequel available to play online as a flash game (<https://www.shellshocklive2.com/>). I will be primarily be describing and comparing to this, the flash version of the game, because it is the one that my stakeholders are most familiar with.

In Shellshock Live 2, players must create an account because there is a system of online matchmaking, where players play against one another over the internet. //finish at home where I can access Shellshock Live 2

## Specification