Project Laservival Outline

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Project Laservival is to be a top-down tank laser survival game. While extra game mode options will be added, the foundation of the game lies within basic survival mode, where, inside of strategically developed maps, enemy tanks spawn within certain time frames with the purpose of attacking the player. With this in hand, we walked through the necessary steps that must be taken as well as potential issues and their respective solutions. The following consists of the most important problem solving procedures:

How would the life system of the player tank be determined? The enemy tank?

This question leads into the huge field of computer design as well as player design. We looked to answer how computers and players would vary and how the basic combat system of the game would function. After discussing the topic, we concluded that all of the following must exist for each tank, both player and enemy, unless specified otherwise:

1. Multiple tank classes exist. In brief, they range from heavyweights to lightweights. As is expected, the lightweights move quicker but have less life force, and the opposite is true for the heavyweights. Furthermore, each class is equipped with its own respective weapon; the heavyweight with a heavy weapon, the lightweight with a light weapon, and so on (equipped weapons are customizable as power-ups in game). In summary, every tank would possess three aspects based on the class: Health force, movement speed, and weapon. Furthermore, computers must be intelligent; the more intelligent the better tracking skills, faster movement speed, better shooting accuracy, etc (precise algorithms for AI are to be determined at a later date).
2. Each weapon consists of a fire rate, a damage output (raw damage excluding rate), and, of course, a name. Weapons are to be designed to match with their respective tanks, but extra weapons exist as attainable power-ups in game, and possibly as permanent achievements provides certain achievements are met.
3. In order to determine the strength of each weapon, we observed the overall mechanics of the game we had planned so far. The goal was to create a balanced gaming experience with different playstyles suited to the player, while also allowing for unique combinations and stronger power-ups for more advanced play. We concluded that fire rate was the most significant aspect of each weapon. While raw damage output is essential to progressing, **the idea of movement while shooting is essential to comprehend**. Since the player is able to move while shooting, being able to shoot multiple lasers while maneuvering the map to his/her advantage is an extremely powerful playstyle. Therefore, the total damage output per second for faster firing lasers is to be smaller than weapons with slower fire rates and higher outputs in order to achieve balance within game, especially at an advanced level.
4. Map design must be regulated before the construction of a single map. Every map must support all playstyles without distinctly favoring one or the other. To allow for variability, slight, evenly distributed favorability in maps for the different playstyles will exist, also giving players the opportunity to adapt to the layout in front of them. Map size was also a concern; to make a large map would require intricate planning of spawn points and the like. How would we establish effective spawning of AI with intricate wall layouts that don’t trap the user or provide a significant disadvantage to the AI? Our solution was to instead reduce the size of the player and enemy tanks; therefore, map sizes do not have to be exceedingly large. There is room for variability of map sizes (again slightly favoring different types of play) **while also giving us, the developers, a much simpler time in coding AI spawning and trap behavior**.
5. We also pondered how physics would commence in our game. For lasers, different properties may and most likely will be added to the minimum characteristics of weapons (as described above). As a result, we agreed to utilize basic Algebra I and Geometry skills to calculate trajectories and reflective paths of lasers that had the property of reflection. We also agreed that lasers are not to harm the player tanks, as this would severely limit map design capabilities for strategic play involving lasers, as well as defeat the purpose of smaller tanks to medium map size ratio. In the unlikely case of oddly behaving lasers (in a physical sense), many of our members are proficient in higher levels of mathematics such as Algebra II to calculate these patterns; also, much exterior assistance is available to us, if we were to need it. **This will most likely not occur.** Tanks do have rotational capabilities, but in smaller intervals. Perhaps eight diagonal turns will equal 360-degree rotation. In the event of a tank driving into a wall, based on which direction it is leaning towards, it will move normally in a forwards direction until there is no longer a blocking structure.
6. Together we decided that the home menu GUI will consist more of simply a play option; accolades and other achievements, as well as options such as controls, tutorials, strategies, and possibly even a collection of Easter-eggs to be found within game will exist.
7. In order to evenly split workload **while also collaborating with each other on every aspect of the game**, we decides that working together on general topics while breaking up specific parts would be most effective. For example, when building our weapon and tank classes, we all individually built separate tanks and the like while discussing topics such as the ones above. We were able to evenly split up the work while also not relying on a single developer to be responsible for an entire portion of the game. Discussions among us regarding prospective ideas occurred and continues to occur before beginning the coding process. Another example of this will be regarding our GUI home menu: each developer is to be simultaneously working on the general GUI of perhaps the home screen. However, each one of us is developing a different aspect of the home screen while discussing. Specific discussions as to what it would look like have already occurred; however, it is us to all of us on top of the developer coding a single aspect to chip in and provide input, perhaps exchanging roles for periods of time to express ideas.

We feel that, with the above explanations, we covered most, if not all, of the necessary problems and ideas to be solved. Additionally, we have developed an effective plan of splitting work among the developers, and are looking forward to further developing this game as well as enjoying the end product.