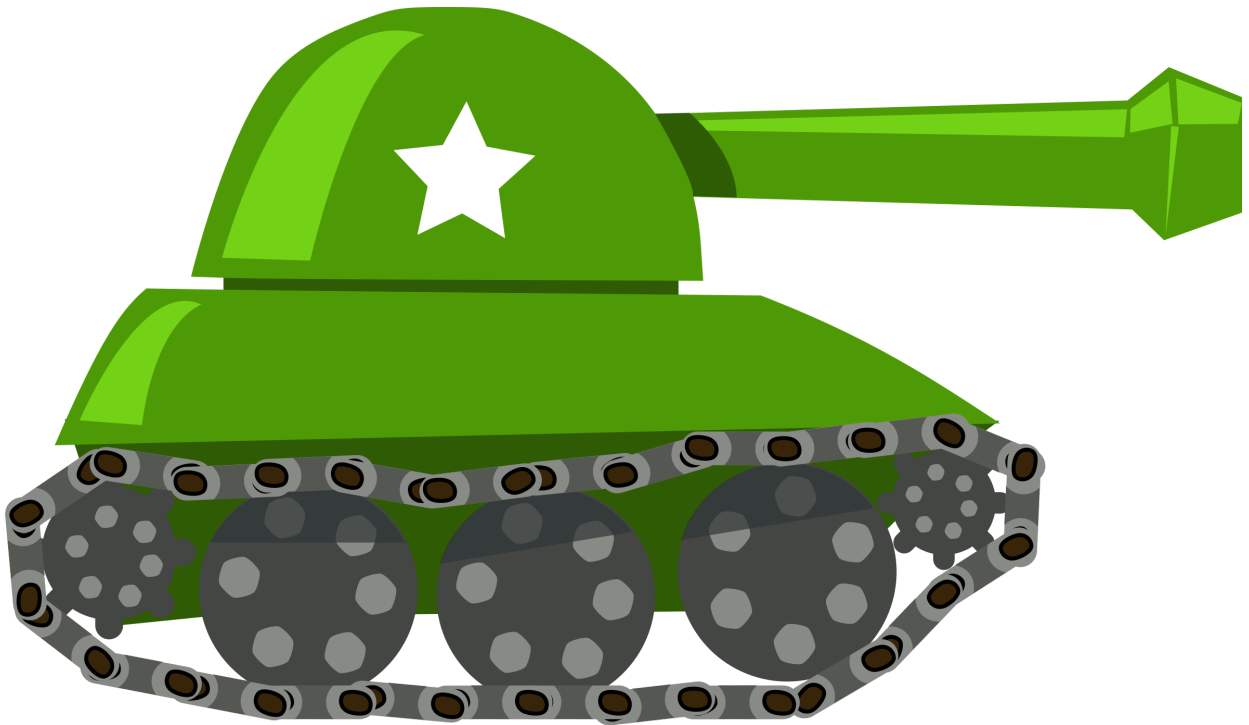


TANK MADNESS



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Logistics of the game

Tank Madness is a very modern video game with various features. Tank Madness is an abbreviation of the game “Tank Trouble” (<https://tanktrouble.com>) and will relatively share the same rules, however, the game modes will be different and unique. The program will be 2D maze-like game. The maze will consist of blocked grids with randomized openings. The game

will have small tank icons that users would

be able to move around the grid and shoot

small bullets that will strike other tanks.

Every game mode there will be a different

maze and some game modes will have

randomly generated maze-like field that will

vary in size and shape each time. The grid

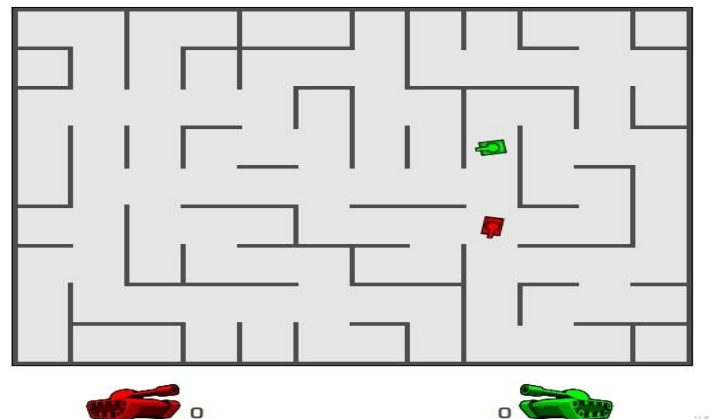
cannot be less than 5x5 and cannot be more than 8x8. Every part of the battlefield should be accessible to the players, there should not be a area that the players would be unable to get to.

Tanks cannot move through black borders (walls) and must only move through the designated openings that can randomly change every game depending on the game mode. The game will

include three different game modes that users can choose from.. The game modes included are:

1. Team Deathmatch
2. Capture the Flag
3. Hard Point

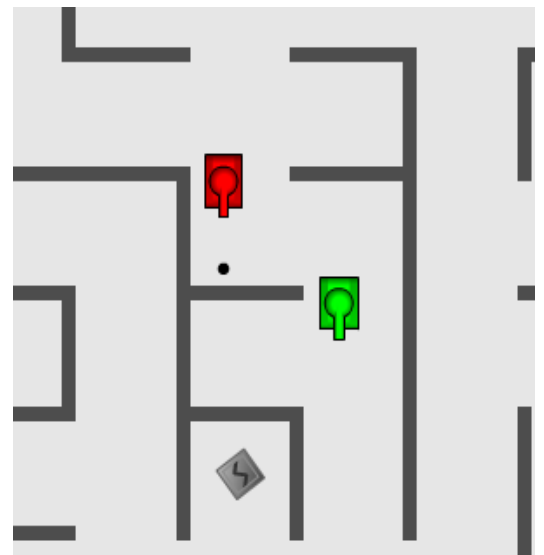
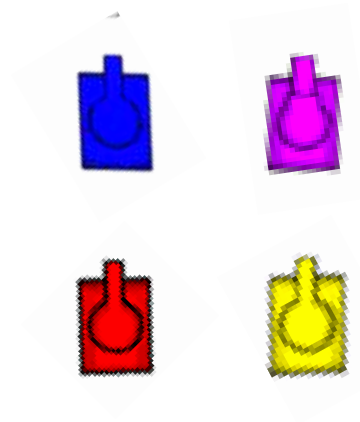
Once the game starts, the opening page should include a title and image in the centre that represents the game. There will be buttons that the user can click on that will take them to the



game modes or a page that explains the rules of the game to the user. The user will be able to flip back and forth from the different pages.

Rules

1. The game is played by two teams. In the two player mode one player controls the red tank while the other player controls the blue tank. The red tank is always controlled by a player, and depending on the game mode selected, the blue tank will be controlled by either an AI or another user. If the four player gamemode type is selected then the players can also control a purple tank and an yellow tank. The yellow and purple tank will be in one team, and the other team will include the red and blue tank.
2. The randomly generated sequence of barriers in the maze-like field will act as walls that objects (such as tanks and bullets) cannot go through. This means that if a tank goes next to the wall it will not be able to go through it and can only move through the empty space in between. Furthermore, the bullets will also bounce off the walls and move in the opposite direction if they make contact with the wall, and also the bullets will not be able to go through the wall.
3. The bullets will be fired from the nose of the tank and will be the same size and diameter as the width of the nose. The bullets will be circular in



shape and move in a straight line in the direction from where they were fired. If the bullets make contact with any of the tanks, then the tanks “explode” by having an explosion icon cover the tank and the other team gets a point/coins depending on the gamemode. If the bullets do not make contact with any of the tanks for six seconds, then they will immediately disappear and be removed from the game. In particular, that means that they should not reappear on the screen and cannot do any damage to the tanks. A player can only fire five bullets at time. Once a bullet is fired and six seconds have passed it should “reload” into the tank and be able to be fired again.

Controls

1. In order to control the red tank the user must use the following keys: <M>, <Up>, <Down>, <Left>, and <Right>. If the <M> is clicked it allows the tank to shoot bullets, the <Up> key makes it move forward in whatever direction it is facing, the <Down> key makes it move backwards in whatever direction its facing, the <Left> key makes the tank rotate in the left direction at 30° increments, and the <Right> key make the tanke rotate in the right direction at 30° increments.
2. If the multiplayer type game mode is selected, the red tank will be controlled using the same combination of keys (<M>, <Up>, <Down>, <Left>, <Right>), and the blue tank will be controlled using the following keys: <Q>, <W>, <A>, <S>, and <D>. If the <Q> is clicked it allows the tank to shoot bullets, the <W> key makes it move forward in whatever direction it is facing, the <S> key makes it move backwards in whatever direction its facing, the <A> key makes the tank rotate in the left direction at 30° increments, and the <D> key make the tanke

rotate in the right direction at 30° increments.

3. If the four player game mode is initiated then we will use the same controls as multiplayer, the blue tank will be controlled using the <Q>,<W>,<A>,<S>,<D>, controls, the red tank will be controlled using <M>, <Up>, <Down>, <Left>, <Right>, the purple tank will be controlled by the following keys: <7>,<8>,<4>,<5>,<6> (making sure numlock is on). If the <7> is clicked it allows the tank to shoot bullets, the <8> key makes it move forward in whatever direction it is facing, the <5> key makes it move backwards in whatever direction its facing, the <4> key makes the tank rotate in the left direction at 30° increments, and the <6> key make the tanke rotate in the right direction at 30° increments. The orange one is controlled by the following keys: <T>,<Y>,<G>,<H>,<J>. If the <T> is clicked it allows the tank to shoot bullets, the <Y> key makes it move forward in whatever direction it is facing, the <H> key makes it move backwards in whatever direction its facing, the <G> key makes the tank rotate in the left direction at 30° increments, and the <J> key make the tanke rotate in the right direction at 30° increments.

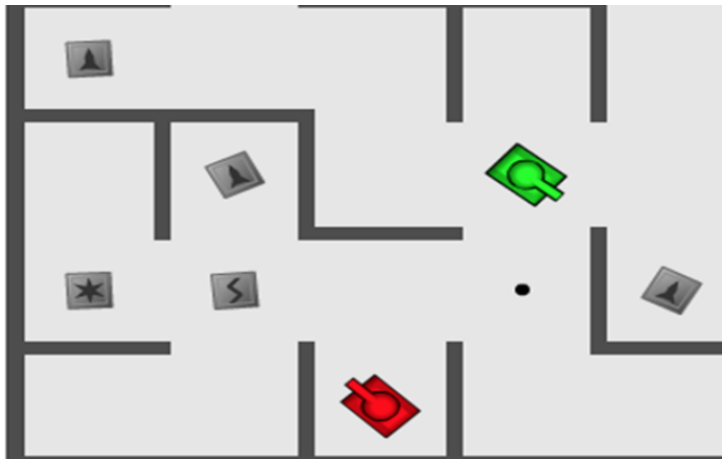


Power-ups

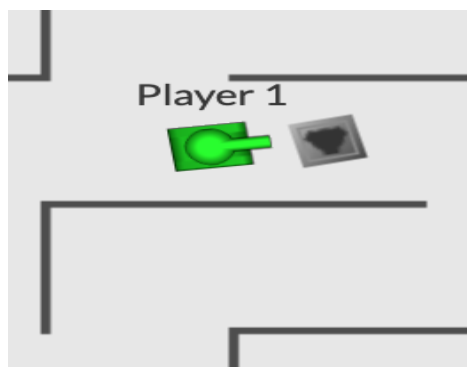
Power-ups provide abilities that will have an instant benefit to any player that picks up a power-up or purchases a power-up. Power-ups will work in a similar way to tank trouble's in game power-ups. Power-ups can be used in all game modes, but power-ups will not appear randomly for pickup usage in the gamemodes Capture the Flag or Hardpoint. Within these 2 game modes, power-ups can only be equipped through purchases in the item shop. The only time power-ups can be picked up will be in team deathmatch. Within team deathmatch, there will be various power-ups within each map that will appear at random. A power-up will appear at random time intervals and the ability that the power-up presents will be completely random. Every 5-15 seconds, a new power-up will appear at a random spot on the map, and there will only be a maximum of 5 power-ups available for pick up on the map at all times. This means power-ups will stop appearing once there are already 5 power-ups on the map. However, if a tank picks up the fifth power-up, a new power-up will appear within the next 5-15 seconds at a random spot on the map. Any tank can pick up a power-up and picking up power-ups will only activate the power-up for that tank only. Power-ups will appear as a small square with a unique drawing in the middle that indicates the ability of the powerup. Only one power-up can be equipped/used at once, meaning any tank that has a power-up equipped will be unable to pick up another power-up when they have a power-up equipped. Basically, as they run over another power-up, the power-up on the ground will remain there and the tank will still have their equipped power-up available for usage. Power-ups will instantly be equipped after any tank

picks up any power-up by running over the power-up with their tank. Once they run over the power-up, the power-up will disappear from the playing field and will instantly activate that specific power to that tank only and that tank will be able to use it. There will be four different power-ups that can be used, where each power-up provides a unique ability. The power-ups each have specific icons that indicate what power-up is going to be activated when picking up/purchasing the power-up. The icon for each power-up is up to the programmer, but will be simple in design. This is what the power-ups will look like, and this is the maximum power-ups

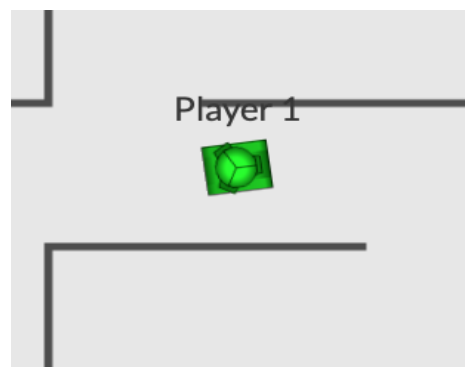
available on the field at all time.



Before Picking Up a Power-up



While and After Picking Up A Power-up

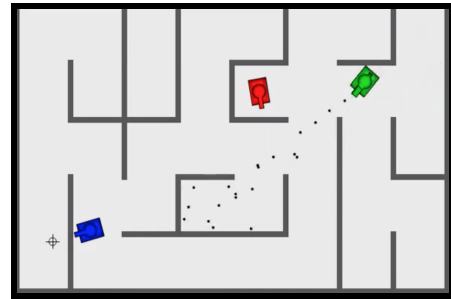


1. Light Machine Gun Power-up

This power-up allows the player who picked up this power-up to have a faster firing rate of their bullets, as the player will be able to hold down their fire button and a lot of smaller bullets will be fired in a shorter amount of time. Essentially, this power-up gives the tank a massive increase for their fire rate, but also comes with the compensation of smaller bullets. The ability will last for four seconds after the tank fires their next shot with this power-up, then it will go back to normal shooting. The gun hole of the tank will also

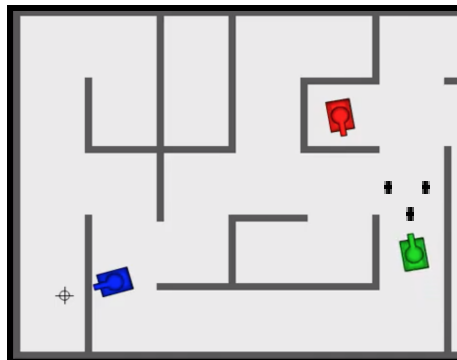
become wider and look more like a heavy machine gun.

On the right, an image shows what the ability will look like once obtained. Speed of the bullets will be the same.



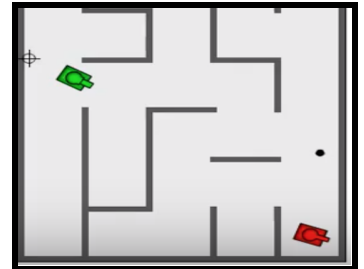
2. Triple shot Power-up

This powerup allows the player who picked up this power-up to shoot with three bullets instead of one with just one shot. Once obtained, the tank with this power-up will be able to shoot three bullets at once which will be fairly close to one another in order to maximize your chance at destroying the other tank. This ability will last until the player has shot twice, which would account for six bullets. Here is what the ability will look like once obtained. Speed of the bullet will remain the same.



3. Explosive Shot Power-up

This power-up allows the player who picked up this power-up to shoot one large bullet which is double the size of the original bullet towards the opposing enemy and four seconds after the bullet is shot, the bullet will explode and will destroy any tank within a 150 pixel radius of the explosion. However, if the bullet hits an opposing tank before the three seconds is over, the bullet will not explode and will do the same damage as a regular bullet. This power-up will only last for one shot and the explosion does not go through walls. Here is what the power-up looks before the explosion and during the explosion. The speed of the bullet will remain the same.



4. Laser Shot Power-up

This power-up allows the player who picked up this power-up to shoot one long and wide laser ray in any straight direction. This laser ray will be able to penetrate walls (will not bounce off walls) and will be 25 pixels in width. The maximum distance the ray will be able to span will be 750 pixels (no matter the size of the map) and will instantly kill any tanks in its path (including collateral kills). The only catch to this power-up is that it takes 2 seconds to load the ray before firing. The gun hole will also change to a ray gun, upon obtaining this power-up. Here is what the power-up will look like after being obtained. The speed of the ray will be the same speed as it is in tank trouble and the ray will be very similar to the one in tank trouble.

Stages of firing the laser

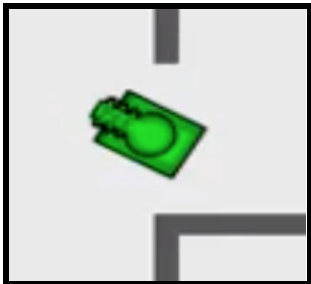
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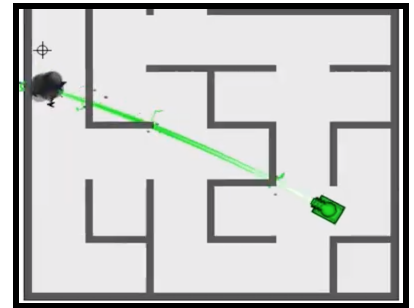
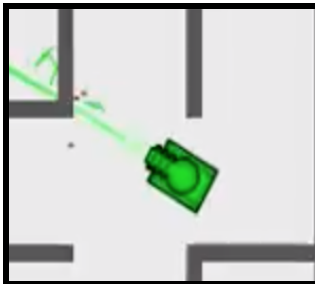
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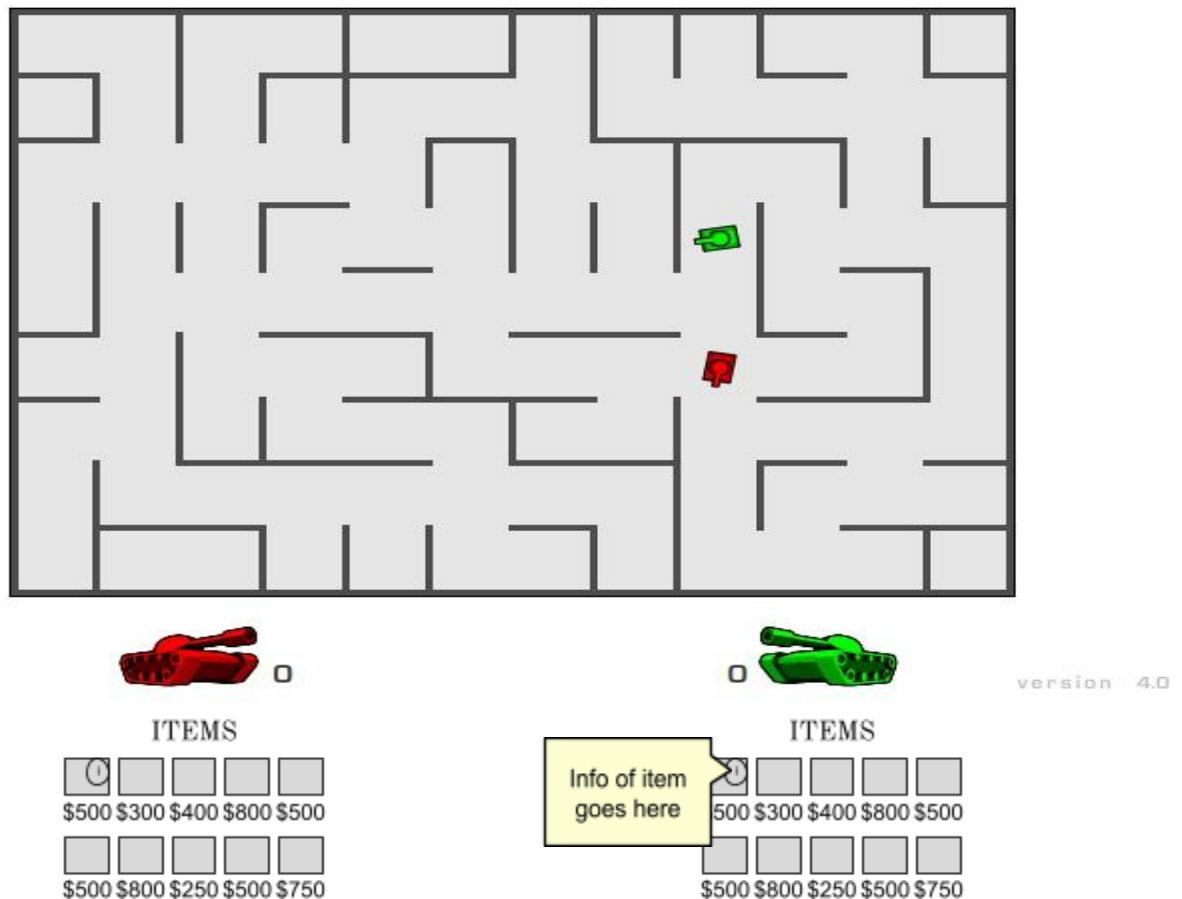
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Items

Items will be available for purchase within only two games modes; capture the flag and hardpoint as well. Items will be available for purchase right below the maze and will be displayed as ten separate boxes that can be purchased with in game money. In terms of the in game money, each team will start off with \$1000 each, and will be able to gain in game money as they pick up money within the battlefield or kill opposing tanks, as killing each tank will give

that specific team \$250 per kill. Items will appear as shown below, except actual items will be displayed within these boxes. Each teams money will also appear on the top corner of there teams side and there will be an info (i) button in the top right of all the item boxes which can be pressed **\$1000** and will give the player information on **\$1000** that specific item and its abilities (see below).



The cost of the item will be displayed right below the item and the yellow box above will have that information of the specific item's ability when it is pressed. To purchase an item the user will simply click on the item they desire and it will be accessible to them immediately. If they do not have enough money, nothing will happen and they will not have access to the item.

The info will have a header that tells you what item it is and a description of its abilities inside the yellow box. For example; Overdrive would have a description of “doubles the speed of the tanks on your team for 10 seconds” (see overdrive item below). There will be an (i) info button for each item and the infobox will have a different header and description, depending on the item and that item’s abilities. Items give their team and tanks an upper edge against the other team, and both teams will be able to purchase items at the same time in the game. An item will be officially purchased once the player has clicked (with a mouse) on the square on their specific side (the item) of the screen and that team has enough money to purchase the item. Your money cannot go below \$0, so you will only have enough money to purchase an item if your money is more than or equal to the item you want to purchase. Once an item is purchased, **all the players on that specific team (up to 2) will instantly equip the item they purchased, as the items are instantly activated after a purchase.** Any player on each time will have the ability to purchase an item with the mouse. Items can be bought over and over again, and there is no restriction as to how many times an item can be used. The game will be continuous and there will be no stoppages for purchasing items during the game, so the players must wisely choose when to purchase the items. The icons of the items will vary and will relate to the ability of each item. The icons of the powerups will be the same icons used for the item boxes. The design of the icons and what item it correlates to is up to the programmer. Once an item is purchased, your teammates usage has no influence on your usage of the item. Meaning if one teammate uses it, it does not go away for the other teammate.

When The Item’s Are Available

The item shop will be available for purchase during the game and during the delayed

respawn time as well. If a team decides to purchase an item during the delayed respawn time, the only players who will receive the effects of the item will be the players on the battlefield only (on their team). The players that are in the delayed respawn can still purchase the item using the mouse (for their team only), but the only players who will equip the items after being purchased are the players on the battlefield. If both players are in the delayed respawn countdown, an item cannot be purchased. The items will only be available for purchase when your team has at least one player on the battlefield. The cost of the item will be the same, regardless if one or two players are going to be able to use it.

A team can only be using one item at a time, meaning once they purchased an item, they will not be able to purchase another item until they've used the item and their cool down period is over. A cool down period is a period of five seconds where any team who just purchased an item will not be able to purchase another item until the time period of five seconds is over. If a team tries to purchase an item within five seconds of purchasing a previous item, a message will appear telling the user that there is a cool down period before purchasing another item. The cooldown period will start right when a user purchases an item and will end five seconds after the user purchases that item. Basically, when the cool down period is in effect, there will be no purchasing of items. The cool down period applies for the whole team, as there will only be one cool down period for each team after purchasing an item. There is also no limit of the amounts of cool downs. When any player on the team purchases an item, the cool down period will be in effect for the entire team.

Also, there will be no purchasing of items if the players on the team have not used up their item. All the players on your team must have used up their items before purchasing another

one. This means that **all the players on your team must be back to a normal tank with no abilities or special power-ups before purchasing another item.** If one player on your team has used up their item and the other one hasn't, items cannot be purchased. The only way a team can purchase an item is if there is no cool down period in effect and no player on their team is currently using a power-up. **The number of players the other team has, the other teams cooldown time, and the other teams use of items does not matter when purchasing items.**

In Game Money

The available money that can be picked up within the battlefield will appear randomly as if they were powerups, and the money can range from \$100-500 (amount of money will be random). Anyone will be able to pick up the money and the money will instantly be added to your teams money at the top corner after being picked up (the money will appear as yellow coins on the battlefield). It doesn't matter which player on the your team picks up the money, the money will still be added the same way. There is no maximum amount of money a team can have. Teams can also gain money by killing tanks on the other team. If any player on one team kills any tank on the opposing team, their team will be rewarded \$250 for the kill and the money will be instantly added to your teams money in the top corner after killing another tank and that tank will be dead (will have to respawn). It doesn't matter if the tank you kill has an ability or which tank you kill on the other team, the reward will still be \$250 regardless. This will go towards the team money as the **money is collected and spent as a team.**

Items Available For Purchase

In terms of the items that will be available for purchase, the top five items in the boxes will be the five powerups that will be instantly activated for all members of one team upon purchasing any of the powerups. The powerups that can be purchased in the item shop (only in hardpoint game mode and capture the flag) will be; increased accuracy powerup, light machine gun powerup, triple shot powerup, explosive shot powerup, and laser shot powerup. The abilities of the powerups will be the exact same as described in the powerup section and the same duration of the ability will apply when the items are purchased. The available items and their prices are listed below:

1. Light Machine Gun Powerup - \$400
2. Triple Shot Powerup - \$250
3. Explosive Shot Powerup - \$500
4. Laser Shot Powerup - \$800
5. Overdrive - \$500
6. Hacking System - \$750
7. Team Link - \$500
8. Mini Tank - \$350

Overdrive

Instantly after purchasing overdrive, both players on the team that purchased overdrive will have an extra engine attached to the back of their tank and both players will have increased tank speed for 10 seconds. This item only lasts 10 seconds, but doubles the movement speed of both players











tanks on the team that purchased the item. The shooting and dying of the tank will be the same. Basically, the only thing that changes is the fact that the movement speed of the tank doubles so the tank can move twice as fast as the normal tank. The ten seconds applies for both tanks so the item will end at the same time for each tank on the team that purchased the item.

Mini Tank

Instantly after purchasing Mini Tank, both players on the team that purchased this item will have their tanks shrunk so they are much smaller than the normal tank. Basically, the tank will decrease in size by 3 times, as the mini tanks will be $\frac{1}{3}$ the size of a normal tank. This will mean the hitbox for the tank will decrease and the tank will be harder to hit and be killed. All other functions of the tank will remain the same, such as same movement speed and same size of bullets and fire rate as well.

Hacking System

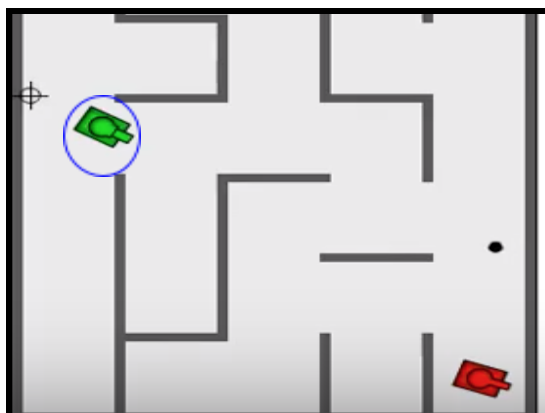
Instantly after purchasing Hacking System, this hacks the other teams item shop, as this item doesn't allow the other team to purchase any items for the next 20 seconds of the game. The opposing team cannot purchase any items for the next 20 seconds, but since you've already hacked their system, you will be able to purchase items after the five second cool down period after purchasing Hacking System. The items that the opposing team currently have equipped upon purchasing Hacking System will not be affected. Basically, your team will have a 15 second window where you can purchase items while the other team can't. There will be an error message for the other team when they try purchasing an item.

ITEMS				
				
\$500	\$300	\$400	\$800	\$500
				
\$500	\$800	\$250	\$500	\$750



Team Link

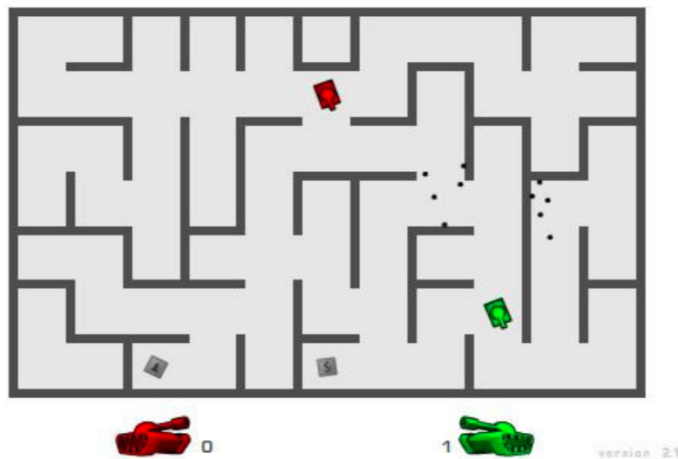
Instantly after purchasing Team Link, both players on the team that purchased Team Link will instantly be teleported to a random spot in the map together. The random spot in the map can be anywhere, but even if your teammate is far away when you purchase this item, you will be linked up in a random spot in the map. Your tanks will appear side by side after being teleported, and the teleportation will take about 2 seconds. You cannot fire any bullets or move when your being teleported, but the other team can. The bullets that were already in the air will not change. You could even appear with your teammate right next to the other team. However, after being teleported, you have a 2 second invisibility period where no bullet will do any damage to you until 2 seconds after being teleported. This will eliminate the possibility of randomly landing on a bullet and being killed. When you are in this 2 second window of invisibility, you can still shoot and move, and the other team can too. You can kill them in this 2 second period, but they can't kill you. To show this invisibility, a blue circle will be placed around your teams tanks to show you can't be shot (see below). The circle will the 2 second period is over (2 seconds after teleporting).



Gamemode 1: Team Deathmatch

This game mode is very similar to “tank trouble”, in terms of the rules you need to follow and how to play. Once the user selects this game mode from the first page, a new page will appear that will ask the user to select from a series of buttons either multiplayer, online, or AI. It is a two player game mode which consists of two tanks (blue and red) that spawn randomly within the maze-like field. The game mode includes a scoring system that tracks the score between the two teams. The goal of the game is to strike the opponent with a bullet that the user will shoot. Once a bullet has hit the one of the tanks it adds a point to the opposing team and respawns both tanks again. For example, if the user is playing as the red tank and he fires a bullet, if the bullet hits the other tank then the red tank gets a point on the scoring system, and If the red tank gets struck by a bullet (either fired by him or the opposing team) and it bounces off the wall and hits him then the other team gets a point and it respawns again in new locations. Once a bullet hits the tank a short 1.5 second explosion picture should replace the hit tanks exact location and should be big enough to cover the whole tank, also the bullet should no longer be visible. After the 1.5 seconds are done the maze should be randomly generated again and the tanks should respawn in new locations on the map. The scores will be tallied on the bottom

centre of the screen, clearly displaying the number of points per team. The red team's points will be on the left side of the center next to the red tank icon and the blue team's points will be on the right side of the center next to a blue tank icon. In order to end the game the user will click a button on the top right corner that will allow them to return to the main menu. Any data from the game the user had just finished should be erased. In this game mode every 15 seconds a random power up icon should appear anywhere on the grid. If any of the tanks go over the icon it should allow them to use that power up the next time they shoot. The power ups only last for one shot, then it goes back to the default way of shooting. Once a team gets the required points to win the game will end and a screen will appear that says which team won. This screen will also have a button that takes the users to the main menu.



Multiplayer

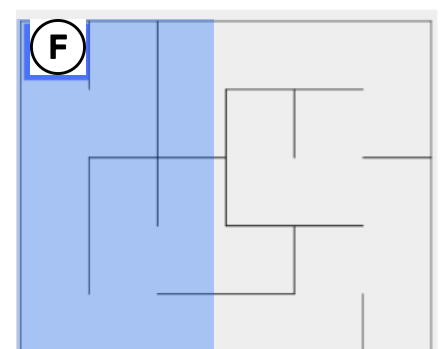
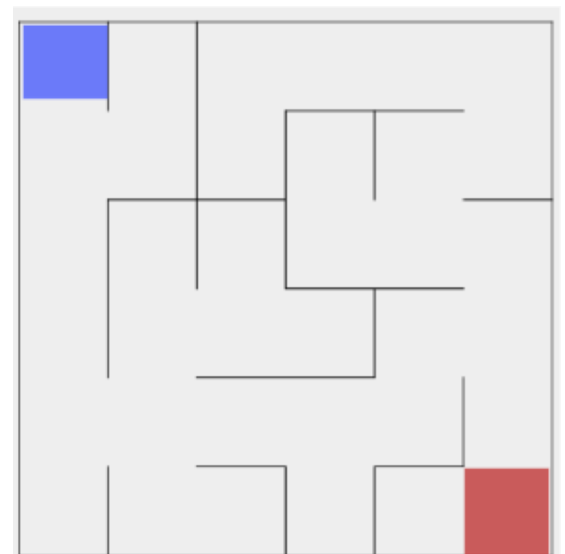
If the user selects multiplayer then multiplayer type game mode is initiated. Multiplayer allows one player to control the red tank using <M> <Up> <DOWN> <LEFT> <RIGHT> controls and second player to play on the same computer using the QWASD controls to control the blue tank. The game proceeds exactly as stated above with two players each one controlling a tank.

Artificial Intelligence

If the AI game mode is selected then the AI type game mode should be initiated. The AI game mode will consist of a the user having to go against an AI that will have the ability to face the opposing team and find ways to reach their tank, it will be able to detect if there is a wall and avoid running into one. It will also be able to move towards the users tank and once it is close and has a relatively clear shot it will shoot at the opposing team. After shooting it should turn and move in the opposite direction of 2 seconds, again avoiding collisions with walls, in order to avoid getting hit by the bullets. Furthermore, the AI will be able to move toward a power up if it appears next to is (2 block radius). Once it gets a power up it will use it as a normal bullet and will fire automatically once it gets close to the user's tank and will also count as a point if it hits the tank. The scoring system is exactly the same as the the other two game modes.

Gamemode 2: Capture the Flag 2 vs 2

Capture the Flag is a gamemode were the objective is to pick up the enemies flag and take it to the your teams home zone. The home zone for each team is next to their respective flag. The home zone for your team will be either coloured blue or red. The home zone will be 100 pixels by 100 pixels and one will be located on the top left square of the battlefield, while the other will be located on the bottom right square. Before the game the host decide which premade battlefield they would like to play on and the amount of points required for a team to get to win the game. The host can also decide if instead of playing on a premade map they could

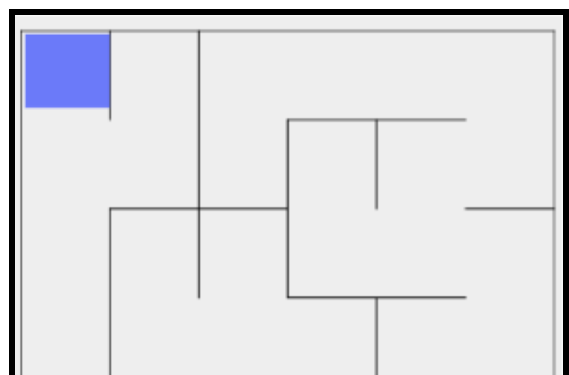


play on a randomized map like picture above. When a player walk on a enemy flag they pick it up, removing it from the flag post, and have it move with the player that captured it, this player now becomes a carrier. When the player who captured the flag reaches their home zone the flag returns to its original location and a point is awarded to the players who captured the flag's team. If the player carrying the flag is killed the flag is dropped in where the carrier died. A dropped flag can be picked up again by the enemy team and their progress to taking the flag to their home zone continues. The dropped flag can also be picked up by the team whose flag it belongs to, this causes the flag to return to its original location with no points awarded to either team. Once a player is killed there will be a three second delay between death and respawn, this will give other team a chance to get to the flag and its off to the races. No points (towards the end of the game) are rewarded for killing a player. Once the respawn delay is over the player will have the option to respawn in a random location anywhere on their teams side of the battlefield. Once a team gets the required points to win the game will end and a screen will appear that says which team won. This screen will also have a button that takes the users to the main menu.

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Gamemode 3: Hardpoint

Hardpoint is a gamemode were the objective of the game is to remain inside a zone for as long as possible. Before the game the host decide which premade battlefield they would like to play on and the amount of points required for a team to get to win the game. A random square (100 pixels by 100 pixels) is chosen as a zone and will have the background of the zone changed to light blue. Every twenty seconds the zone will disappear and be moved to another random square



on the battlefield. A team scored a point if they have an player (from their team) inside the zone the moment in disappears and moves to another square. If both teams have a player inside the zone both teams are rewarded a point. If a team has multiple players (of the same team) inside the zone the amount of players in the zone is the amount of points gained for that team. In the case of three players being inside the zone, were two players are on the same team and one player is on the other team, the team with two players in the zone receives two points and the team with one player in the zone receives one. Whenever a player is killed no points are awarded, but the player kill will have a three second delay before respawning. A player respawns in a random square on the battlefield that is not the current zone. Once a team reaches the required points to win the game and the score is not tied the game will end and a screen will appear that says which team won. This screen will also have a button that takes the users to the main menu.