

## 1. Usage instructions/Game rules


- 1) Before running this game, make sure that after opening the project in Visual Studio 2008, Project -> CourseworkBase Properties -> Configuration Properties -> Debugging -> Working Directory is set to be "..".
- 2) Run this game with Ctrl + F5
- 3) Read simple control instructions on the initialization page, and press SPACE to come to level 1.
  - a. LEFT, rotate firing direction anti-clockwise
  - b. RIGHT, rotate firing direction clockwise
  - c. SPACE, fire balls / accumulate firing power
    - i. Note: Player cannot fire a ball if the number under

*Available balls*


is equal to zero.


- d. P, pause
  - e. ESC, exit
- 4) Launchers



- a. Player's launcher: , launcher controlled by player. If health line of this launcher comes to zero, game over.




- b. Enemy's launcher: , launcher controlled by computer. If health line of this launcher comes to zero, it will be destroyed. If all such launchers in current level have been destroyed, player will get to next level.

- c. Health line: , a line to show how much health point left of the launcher below this line



## 5) Tiles can be categorized into following groups





- a. None tiles: , display part of the background image. Nothing can collide with this tile.





- b. Vulnerable tiles: . They can collide with balls. Each time after collision, number

displayed on the tile will decrease by one. If it is  before collision, it will change into  (None tile).

c. Solid tile: , which can be collided by balls, and nothing will happen to it no matter how many times of collision occur.


d. Passage tile: , which CANNOT be collided by any balls like None tiles. Besides, balls passing this tile will be transported to another random Passage tile.


e. Speed-up tile: , which CANNOT be collided by any balls like None tiles. In addition, balls passing this tile will consume this Speed-up tile (current Speed-up tile will change into a None tile and the ball consuming it will speed up). In the meantime, a new Speed-up tile will appear somewhere else in place of a None tile.


f. Reverse tile: , which can be collided by balls, and never broke just like a Solid tile. Besides, it can reverse sign of a ball that is colliding with it. In other words, positive balls will change into negative balls after colliding with this tile, while negative ones will be positive after collision. (See definition of positive and negative balls below)

## 6) Balls

a. Balls can be divided into three categories.

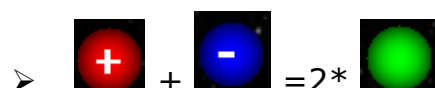
i. Positive ball: , balls fired by player's launcher

ii. Negative ball: , balls fired by enemy's launcher



iii. Neutral ball: .

b. Balls will have following rules

i. If there is a collision between a positive ball and a negative ball, both of them will become neutral balls.



- ii. If a neutral ball happen to collide with another neutral ball, both of them will explode.




➤  +  = 0 (explosion)




- iii. Sign of a ball will be reversed when colliding with a Reverse tile.

➤  +  =  + 

➤  +  =  + 





- iv. Player's launcher will lose health after being collided by a negative ball, while enemy's launcher loses health when being collided by a positive ball. Both positive ball and negative ball in this case will explode after collision.





➤  +  = 0 (ball explosion) +  (launcher losing health)

➤  +  = 0 (ball explosion) +  (launcher losing health)

- Note: How much health a launcher loses after such collision will depend on collision power, which is magnitude of a portion of ball speed along the direction specified by centre of the ball and centre of the launcher.

- v. Player's launcher can gain health after collision with a neutral ball, and the ball causing this collision will change into positive state. Similarly, enemy's launcher can gain health from a collision of a neutral ball, and that neutral ball will become negative after collision.

➤  +  =  +  (launcher gaining health)

➤  +  =  +  (launcher gaining health)

- Note: How much health a launcher gains after such collision will depend on collision power, which is

magnitude of a portion of ball speed along the direction specified by centre of the ball and centre of the launcher.

7) Pass to next level /win

- a. If all enemy launchers are eliminated, player will pass to next level.
- b. If current level is the last level and player intends to pass to the next, player will win.

8) Lose

- a. If health point of player's launcher comes to zero, player loses this game.

9) Scores

- a. Health gained by player's launcher (lost by enemy's launchers) will increase current score, and the score increased will be proportional to health gained (lost).
- b. Similarly, health lost by player's launcher (gained by enemy's launchers) will decrease current score, and the score decreased will be proportional to health lost (gained).
- c. Highest score will be initialized from file "highestScore.txt" when game begins, and default to zero if no such file exists.
- d. Highest score will be updated, if player has passed all levels and current score is higher than the highest score.