CS 101

COURSE PROJECT DOCUMENTATION

ARTILLERY DUEL

GAME OF WAR BETWEEN THE TANKS…….

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INTRODUCTION

The aim of the project cs 101 is to write an effective and elegant code which serves as perfect learning experience for developers and provides mind refreshing content for the users. Artillery games are usually classified as one of the most fascinating games. History of development of earlier artillery games takes us back to the era where COMPUTER was just emerging and people tried to make such games using their knowledge about projectile motion and limited features available them at that time, but their code contained lot of logical error. With more advanced computer and various software technologies available to us, we thought about making a game with our knowledge about projectile motion and basic c++ coding to tackle all the challenges and come up with an strategy game "ARTILLERY GAME".

The point of the game is to use various weapons, which come in various packs, to attack the other player's tank. Each hit scores a certain amount of points, which varies based on the weapon and proximity. At the end of 10 volleys, the player with the highest points wins.

"Artillery games" is a multiplayer game which involves the tanks fighting each other in combat or similar.

PROBLEM STATEMENT

Our aim was to build a strategy game that involves two tanks set certain terrain with weapons fighting in a battle with good quality graphics(finally landed up with opengl).

With these weapons , the volley shots back and forth until each tanks weapon stock is exhausted(this is predefined to be 5weapons each player).

Artillery Duel is strategy game in which player hits the tank of the opponent to earn points. The player who earns more points wins. Strategy is key to winning. Game provide a good platform to learn graphics and coding in c++ language.

***Randomizing the terrain** - formation of the new terrain every time player starts the game.*

Providing a background music so to make the game more realistic as well as look professional.

SOFTWARE REQUIREMENT

Game is designed to run on windows7 and Windows8

OpenGL - For a graphical interface.

Code Blocks - For writing the code and building the project.

Git Hub - To manage and update the project.

GNU GCC Compiler- For compiling the C++ game code

IMPLEMENTATION & FUNCTIONALITY:

Various functions used are as follows-

Drawterrain(double x,double y):-we have used this function to draw random terrain which are the soul of the game.There is an inbuilt function 'glBegin(GL_QUAD_STRIP)' to draw an quadrilateral and glColor3f(float red,float green,float blue) to set the color.what happens is using rand()

we have generated random 5 x and y coordinate and used this function to join them to make randomized terrain.

Drawbutton();-using same idea we have made a power meter which is used to change the velocity of weapons that are fired.

Drawtank():-we have used this function to draw tanks on the terrain again using "GL_QUAD_STRIP".

Launcher():-This function is used to draw launcher of the tanks which gets aligned according to the angle set by the player and weapon are fired from it when space key is pressed..

Arrow (double xpos,double ypos):-This function is used for creating weapon.arrow() accepts x coordinate and y coordinate each time when it is called and we have shown animation in sniper,air strike

weapons by calling it several time till the weapon touches terrain surface or tank.

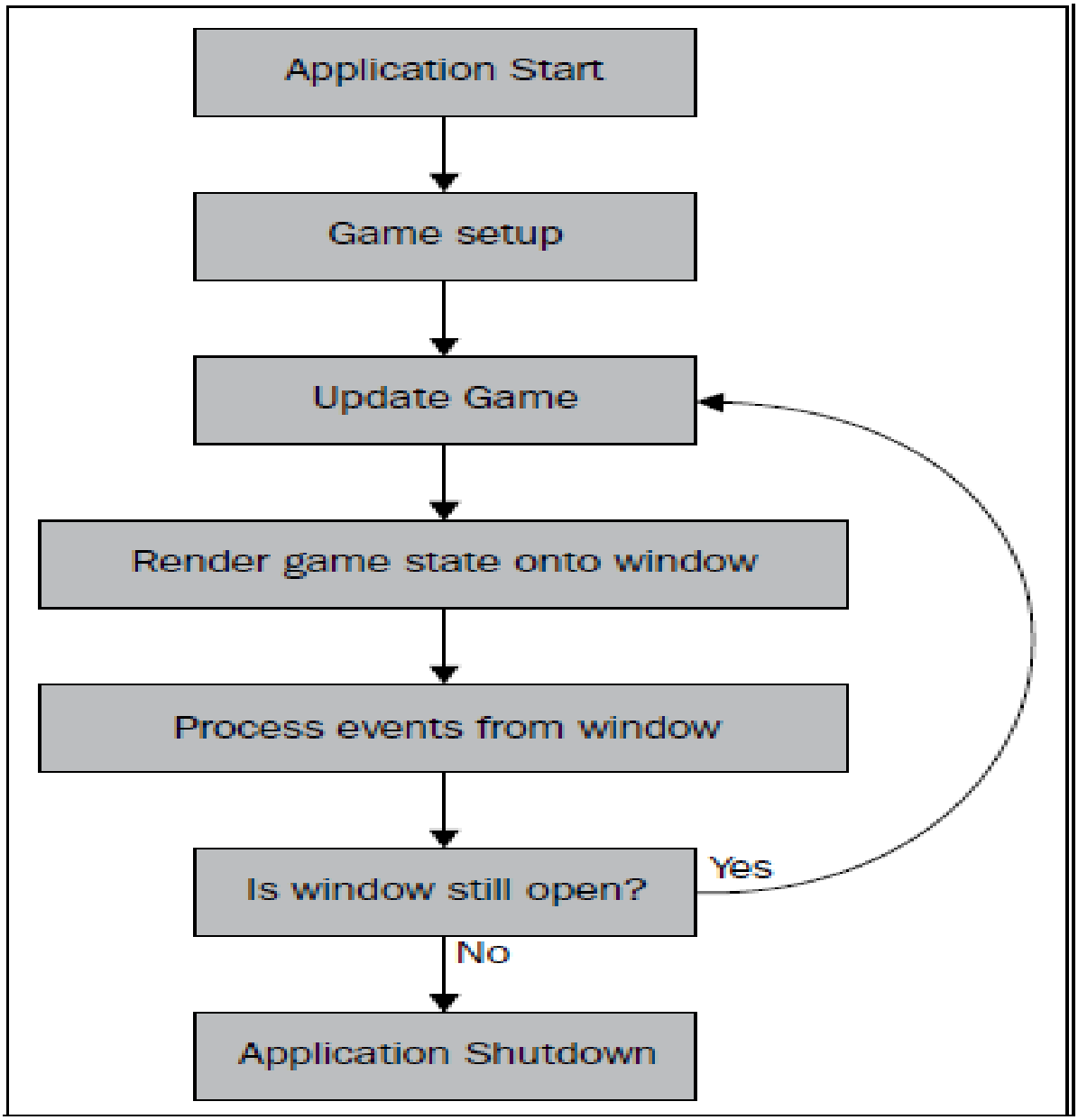
Void drawstars (float fX,float fY):-This function is used for creating stars at specified x and y coordinate.we have shown animation in miracle bomb using this function.

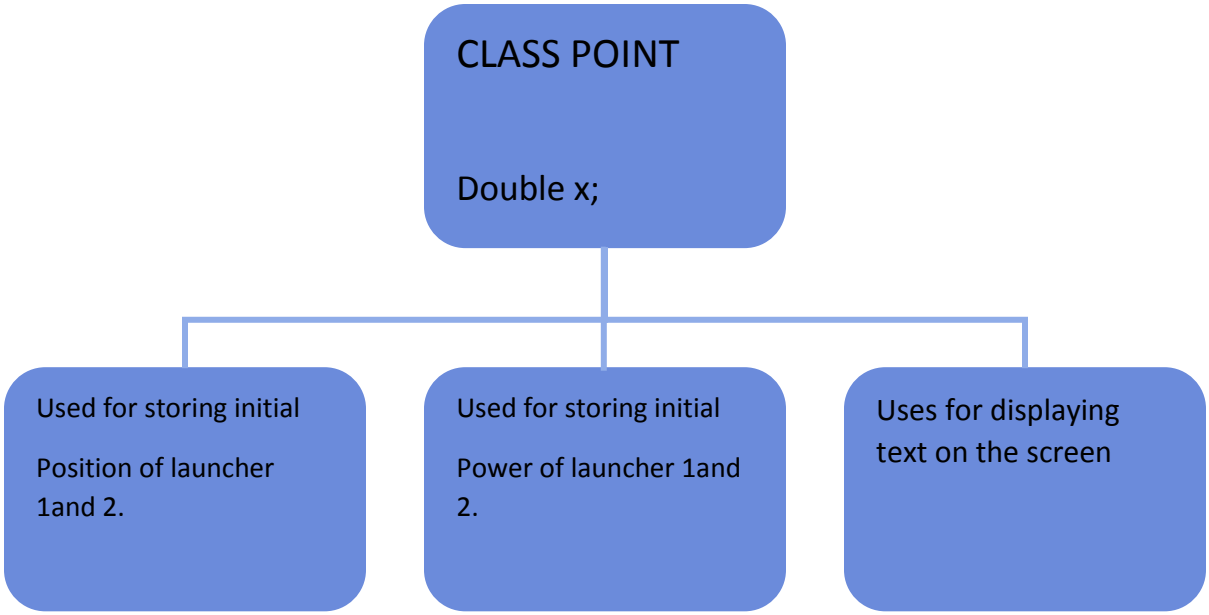
*Void mainscreen (void):-we have used this function to display main screen of the game which gives the user option to start a new game,read instruction and quit the game. we have used"renderBitmapString(x,y,(void *)font,"TEXT")",to display text on screen.we have to specify x and y coordinate,type of font that we want to use like 'GLUT_BITMAP_TIMES_ROMAN_24', 'GLUT_BITMAP_HELVETICA_12',that are predefined in OpenGL and text that we want to be displayed.*

Instructionscreen (void):-we have used this function to display all the controls of the games using similar technique as explained above.

Weapon ():-we have used this function to display weapon list once the game starts. Player can choose desired weapon from this list.

Point mouse (int x,int y):-we have use this function to convert mouse clicks x and y coordinate to x and y coordinate of our OpenGL window. Initially we have defined screen coordinate to vary from 0 to1.


Application Start
Game setup
Update Game
Render game state onto window
Process events from window
Is window still open?
Yes
No
Application Shutdown


CLASS POINT
Double x;
Used for storing initial
Position of launcher 1and 2.
Used for storing initial
Power of launcher 1and 2.
Uses for displaying text on the screen

Discussion of system

Problem faced:-

Using opengl graphics library was itself a big challenge to us. Getting into that, first thing we addressed was making a elegant background, tanks, etc.

Providing motion to tank was bit challenging that to taken care by defining coordinates of tank as variables and shifting it by a fixed amount along the terrain, everytime player press z or x.(z-forward & x-backward).

RANDOMIZE THE TERRAIN- at first it looked a nightmare but after having the knowledge of function provided by c++ ie "crand( )", randomizing the terrain was easily achieved.

Boundary conditions:-

LOGIC OF RANDOM TERRAIN-

Terrain shown in game basically consist of five quadrilaterals (specifically trapezium), in which first and the last one are fixed(in which tank resides) in the sense their vertices are predefined, while those of remaining the three at middle their bottom vertices are fixed while upper two are defined by "crand( )" function which gives random value whenever the function is called.

How is the position of tank defined while it runs over exploded surface?

Right for now we took care that no such condition arise.

Firstly, maximum displacement of the tank is constraint upto last vertex of first trapezium, ie it cant go above that. Same is the case on other side with second tank.

What if volleys strike on the first trapezium itself? For that we took care that terrain isn't removed when volleys hits first or last trapezium.

Overall, removal of removal of terrain takes place only in middle three quadrilaterals and since tanks are not allowed to reach upto that position, our tanks are not running over exploded surfaces anyhow!!!

Scoring

Ultimate aim of game is to score more points than opponent. That is done when volleys hit the opponent tank, with greater proximity,ie maximum points are gained when volley hits at the center of the tank and it decreases linearly along the length of tank.

> *So for wining not only hiting will do the job, but accuracy is also demanded!!!!*

Testing strategy and data

Game is well tested and ran in windows 7, 8 pc.

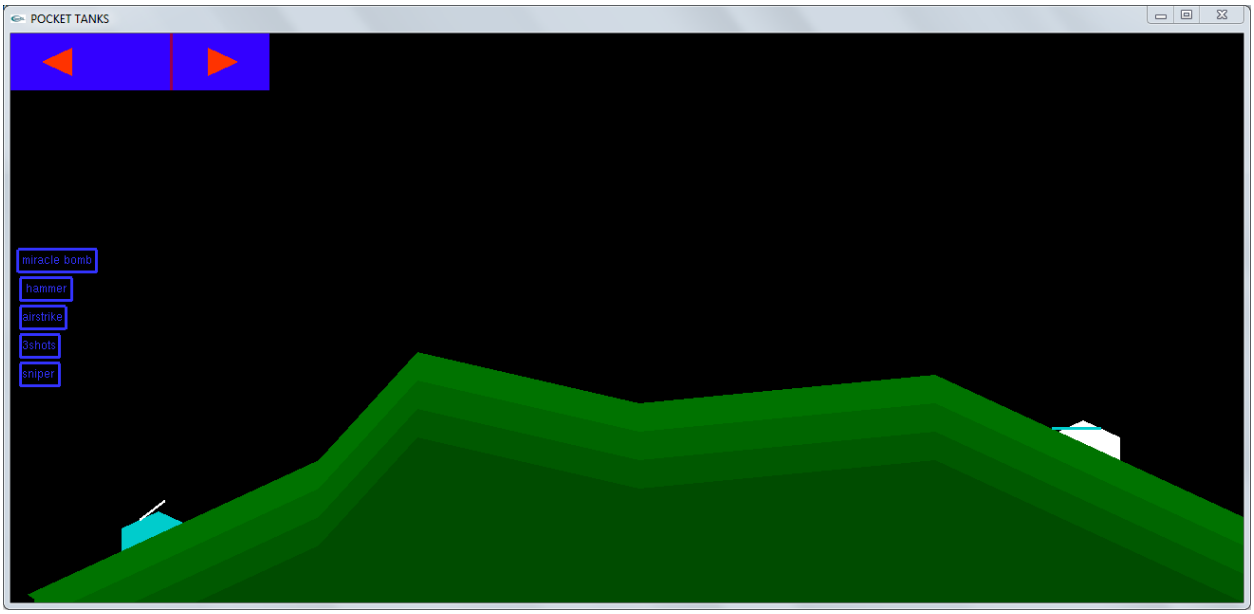
Some of its features include-

Gamestarts from here

Instructions window can be seized by clicking on “INSTRUCTIONS”:

After going through the instructions game can be played:

Game’s preview:-



FUTURE WORK

** One important aspect is movement of tanks over exploded surfaces.*

** Animate while volley(missile) hits the ground.*

Using artificial intelligence for providing single player settings in the game.

**Making game in 3-D, and hence further increase the number of players to 3 or even 4!!!!*

**Use graph plotter, to give user choice to select the terrain of his/her own choice by giving the equation of curve.*

CONCLUSION:-

SIMPLE YET ENTERTAINING GAME IS COMPLETED.

REFERENCES:-

1. Code-blocks installation guide and manual:

- *http://www.cse.iitb.ac.in/~ranade/simplecpp/*

- *http://www.it.iitb.ac.in/frg/wiki/images/e/e8/Code*

BlockManual.pdf

2. Guide for including OpenGL library files in Code-blocks :

- *http://www.deannicholls.co.uk/tutorials/show/cpp_*

glut

3. OpenGL Tutorials:

- *http://www.glprogramming.com/red/*

- *http://www.cs.uccs.edu/~ssemwal/indexGLTutorial.*

html

- *https://www.opengl.org/resources/libraries/glut/sp*

ec3/node113.html