CS 22510 – Assignment 1

"Building occupancy grids"

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This paper contains what I have done to develop my program, explains it and justifies my design at the end.

1. What I have done:

I have been using CLion IDE from JetBrains because I am feeling comfortable of using it. I started of reading about dynamic array provided by <vector> header file and std namespace. Then I created Position.h header file which contains two structures Position and Cell. That two structures represents the position of the robot and single cell which is a part of our grid.

Next step was creating a class OccupancyGrid, so I had to create both files .cpp and .h to have a function prototypes in header file and declarations in C++ file. I have created several functions, beginning from power function which is simple quadratic function so it doesn't need to be described.

Class OccupancyGrid contains private variables xWidth, yHigh which are the width and the high of the grid and also have Boolean pointer type named cells. In public part of the class we hold prototypes of the functions.

OccupancyGrid() – Default constructor which creates one dimensional array sized 50 multiplied by 50 and filling it by false statement

OccupancyGrid(int width, int high) – constructor same as previous with one change only. When we are creating array we multiplying this values.

~OccupancyGrid() – default destructor which print out the message when object is destroyed.

Cell_index() – indexing the cells but first thing to do is write a simple equation to have an integers not the double variables.

markCells() – Worst function to write for me. I had many problems with calculating degrees from radians even if assignment description provided us a equation how to do it. Main thing I forgot was to include "math.h" header file at the beginning so I had a lot of errors after calculating the values. Although, function was problematic it works fine and at the end of it I have added simple if statement to ignore cells outside the occupancy grid and setting their statement to true.

Display_grid() – function which printing out the grid. "*" as an obstacle and "space" as a free space.

User_input(), pose_from_file(), ranges_from_file() – are functions to take a names of the files and read information from file to program.

2. Critical evaluation of the design:

I think that my design of that assignment is alright. I spent a lot of time to develop the idea of solving the problem and writing code after all. I hope that I filled up all parts of the assignment and the result is worth best marks.