This program primarily focuses on using a “zigzag” algorithm to search the grid starting from any given home position. This will keep updating the addresses of two variables robotCol and robotRow until they detect where the marker is. Once we have found where the marker is, the robot will find the most optimal path to go to the marker and it will return by tracing back the same path in which it came from, until it reaches the home position, where it started from. This will work for any arbitrary NxN grid (within the pre-defined parameters mentioned in the source file), as it will be re-scaled to fit the constant 500x300 window size. The program is split into 5 different files, including a header file (not including the drawing app files).

1. globals.h the header file which we declare all the global variables (and check for multiple inclusion of same header file)
2. globals.c in which we assign a numerical value to all the global variables for all the other files to work with.
3. algorithms.c in which we consider how we should move the grid depending on our home position and check when we touch the marker.
4. drawing.c contains all drawing files that we will be outputting to the window.
5. main.c contains the body of the code, namely all the function signatures, creates the grid and calls the appropriate functions from algorithms.c and drawing.c when required.

As we are compiling 4 different files (globals.h is not compiled) I compiled the 4 different files separately without linking them and then combined them into a single executable, so it would look like this:

1. We first compile the global variables by using:

“gcc -c globals.c -o globals.o” (and we make an object file called globals.o) (recall that the order in which we compile the files matters in this case)

1. “gcc -c algorithms.c -o algorithms.o”
2. “gcc -c drawing.c -o drawing.o”
3. “gcc -c main.c -o main.o”
4. Link all the object files together to produce a single executable file named run:

“gcc main.o graphics.o globals.o algorithms.o drawing.o -o run” (remember to also link the graphics file)

1. Use the drawapp command to execute the linked file “run”.

./run | java -jar drawapp-3.0.jar

At the end it should look like the following:

