# Homework Lab 4: Loops continued

***Exercise 1***

A treasure is hidden someplace – the treasures coordinates are (x1, y1)! The coordinates (x1,y1) are determined randomly, using the code that is listed at the end of this exercise. The purpose of the game is for the Explorer to find the Treasure!

The explorer is allowed to go North, South, West or East, and can decide how many steps to take at once. The Explorer is first positioned at location (15,15). If the explorer goes North by one step, only the Explorer’s y coordinate is increased by 1. Similarly, if the explorer goes South by two steps, the y coordinate is decreased by 2. In the same fashion the x coordinate is increased or decreased by steps depending if the explorer goes East or West, respectively.

Each time the Explorer ‘moves’, the distance between the Explorer and the treasure is computed. The formula for the distance between (x,y) and (x1,y1) is distance = sqrt(static\_cast<double>((x-x1)\*(x-x1)+(y-y1)\*(y-y1)));

When the Explorer’s position is the same as the Treasure’s position, the Explorer found the Treasure!

Procedures

1. Ask the user to move: Please enter direction (n,s,e,w) and number of steps in that direction.
2. Update the Explorer’s coordinates.
3. Calculate and display the distancefrom the Explorer to the Treasure (this information will clue the Explorer to either keep going in the same direction or switch directions).
4. At the end of each loop display the Explorer’s coordinates.
5. Make sure that you print out how many moves it took (number of times the loop ran) to reach the treasure.
6. Use the starter code below, and see hints below the starter code to help with developing code

#include <iostream>

#include <cstdlib>

#include <ctime>

#include <cmath>

using namespace std;

int main ()

{

int x=15,y=15; // Explorer’s coordinates

int x1,y1; // Treasure’s coordinates

char direction;

double distance;

bool treasure=false;

srand(time(0)); // secretly seed the rand function !

x1=rand( ) % 30 + 1; // set X1 to random between 1 and 30

y1=rand( ) % 30 + 1; // set y1 to random between 1and 30

 //write loop to find the treasure

HINT: When developing the code, print out the coordinates of the treasure to help in testing. Once the code works well, comment the print, or remove those lines.

***Exercise 2***

Go back to your revised Game Menu. Revise it again! Add the treasure game above.

Use a loop to redisplay the Game Menu every time the user finishes playing a game. The user can keep choosing a game to play. Your program will not end until the user chooses 3 to Exit.