CMPT 125/126,
Spring 2009, SFU Burnaby
Instructor: Diana Cukierman

Project #2: Magni rocks in outer space – Initial description.

This assignment is meant as team of two or up to three people work. No sharing of code should be done between different teams. If in doubt about academic honesty policies please check the course website and/or ask the instructor. Distribute your work fairly among teammates, it is your responsibility!

Submission deadline: *Due date: Monday April 6, 3:00 pm via the submission server. No late submissions are possible as this is the last day of classes and a solution will be discussed then.*

Initial general description of the project. More details, including submission requirements will be posted later. Use this description to help you understand the problem and create initial notes, diagrams, perhaps some basic coding. READ THE WHOLE DOCUMENT. TAKE NOTES.

In this project you will implement a two-player board game. The two players will be computer-players. The user will be just asked to provide parameters to define the game such as the initial size of the boards and data for the boards and players. The program should show the user how the game evolves, the final results, and who the winner is.

The players are space pirates: they are travelling in outer space and traversing worlds through wormholes, risking their lives encountering numerous alien races and celestial catastrophes but also encountering Magni rocks! (Magni is a minor and quite unknown planet, but the space pirates know that the rocks from that planet are an invaluable treasure! Some may kill to get Magni rocks!)

We will represent the route the players follow with two (2) boards. Each board represents a different parallel world or dimension (the worlds are referred to in this document as 'wx' and 'wy'). Originally both worlds have cells numbered from #0 to #n, the same #n in both boards (the original #n is provided by the user). Notice however that the worlds may lose some cells due to celestial catastrophes as described below!

The two players start the game in cell #0 of one of the boards. Cell #0 in both worlds have no risks (i.e. risk level 0), no wormholes and no Magni rocks. Each player will start with a certain number of "lives" and an empty chest (with no Magni rocks at all). Players will be playing, one at a time, alternating, and travelling in outer space (moving along one board and potentially changing boards), collecting Magni rocks, running certain risks (which cause the loss of life-points), potentially attacking each other, until the game is over.

The space pirates travel based on a die. This die is rolled randomly just like any regular die, but it is a special die: it can have positive, 0, or negative values. Therefore the space pirates can move forward or backwards in one board (or possibly stay in the same cell).

Each board/world is circular. So, for example, if n is 7 (maximum cell number that is present in the board), and a player is in cell #3 and gets a die value -5 then the player should move to cell #6, (recall that boards have position 0). Another example: if n is 7, the player is in cell #3 and the die is 6, the next player's position will be #1.

Some cells in a board/world may connect to the other board/world through a wormhole. When a space pirate arrives at a cell where such connection originates he or she will be automatically transferred to the same cell number in the other dimension. Wormholes transport players in one direction only, from 'wx' to 'wy', same cell number or reciprocally, from 'wy' to 'wx' (same cell number as well). If coincidentally there are two wormholes in the same cell number in both worlds (for example cell #3 from 'wx' to 'wy' and cell #3 from 'wy' to 'wx'), then a space pirate arriving to that cell (in either world) will get trapped in between worlds and we will consider him/her dead, (causing that the game be over). The number of wormholes in the boards is provided by the user and it is checked to be less than the number of cells. You can choose to have the same or different numbers of wormholes in the boards.

Each cell (whether containing a wormhole or not) in the world/board has a certain number of Magni rocks and a risk level (both are integer numbers).(Cell #0 in both boards has no Magni rocks and has risk level 0). (The risk levels correspond to various alien races that may be in that area, some aliens are more dangerous than others).

When a player arrives to a cell he/she will pick Magni rocks (sometimes all of them, sometimes leaving some) and keep them in his/her chest. As the space pirate moves through different cells he/she player will keep accumulating more and more Magni rocks. This is a risky activity: each time a player arrives at a certain cell he or she loses some life-points, as many as indicated by the risk level in the cell.

If a player arrives to a cell which was visited previously, either by the other player or by him/herself, the player may not be able to collect any Magni rocks (if they were picked up before) but he /she will lose the corresponding lives due to the cell risk level (the aliens stay in the cells all the time). If a player stays in the same cell in a subsequent turn (for example because the die value is 0), again the player may not be able to collect more Magni rocks, but will lose the lives based on the risk level again.
If a player falls into a wormhole the player will collect the rocks and suffer the risks from the final destination (after traversing the wormhole) (unless he/she dies because of getting trapped with the two wormholes in the same cell number), in which case he/she cannot collect any rocks and risks do not affect him/her either as he/she dies.

The game is over when a certain number of turns were played (this number is provided by the user) or when one or both players "die". A player "dies" when he/she runs out of lives or when he/she dies due to being trapped between two worlds with the back and forth wormholes or because of a celestial catastrophe (as described below).

The winner of this game is the survivor (if the other one dies), or if both die or both survive and the game is over, the one with more Magni rocks.

There are two different types or styles of players: kind space pirates (yes, there are such!) and aggressive. In one game the two players could be of the same or different style (the user selects the type for each player). The two types of players obey almost all the same rules, with some differences: The kind space pirate only collects half the Magni rocks and will never attack the other space pirate if they happen to be in the same cell.
The aggressive one… will pick up all the Magni rocks and, if he or she arrives at a cell where the other is, he/she will rob all the Magni rocks that the other player has!

"Celestial catastrophes" (cosmic rays, asteroids…) can happen; such is life in outer space. Every time before each player plays, the game should check (or rather randomly possibly generate) a catastrophe (and affect the boards and players accordingly). A catastrophe can hit one (any) cell number, randomly (there may be turns with no catastrophes). Both worlds are affected by the catastrophe, in the same cell number. And so, one cell from each world gets destroyed given a catastrophe.

If a player or both players happen to be in a destroyed cell, then he/she dies (and does not get to play again). Notice that after a catastrophe there will be one cell less in each world/board, and the cell number where each player currently is may change reflecting this disappearance of the cell. The maximum number of catastrophes that can take place in one game is provided by the user.

As the game evolves the user has to be kept informed about the game, including whose turn it is, how many Magni rocks and lives each space pirate has, if a celestial catastrophe just occurred and where (cell #), what is the path that each player has followed so far, etc. (Show the information to the user and allow that the user types something in to give the user some time to look at the information).

At the end of the game the user has to be informed of who the winner is, how many Magni rocks and lives they have and which path each player followed since the game started.

The path that is kept for each player will indicate the world/cell number that each player visited, for each step the space pirate took. (If a cell was destroyed the history does not get changed however, an indication that a catastrophe happened should be registered in the path before the player takes another step).

The interface to the user can be just text based or (for bonus points and a more interesting game) you can also add some graphics showing the boards and where the players are (using the DrawingPanel methods). It will be possible to create another type of player with different behaviour for bonus points as well.

An intermediate submission submitting whatever material you have is due Monday March 30, by noon.

End of Initial description of project #2