27/12/2015

BLM1551
Introduction to Computer Science - I
SEMESTER PROJECT
(Due 06/01/2016) – version 2

Important Note: **This document might be updated to answer your FAQ, so please frequently check website for updates and check the version number of document to see if it is updated.**

SUBJECT
You will implement a "MEMORY" game.

MEMORY GAME

This game aims at completing the memory walk using the transition cells of the board. The user will be shown a matrix with transition cells (1) and empty cells(0) for a predefined time. Then, the transition points will disappear and the user will start to find the transition points step by step. If the user makes a mistake, the game will end. Meanwhile, the time is important and should be saved.

0	0	1	1	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1
0	1	0	0	0	0	0	1	0	0

Fig.1 An example of a raceway

2. System Details

This section describes the inputs and the outputs of your implementation. You must design your implementation according to the rules mentioned in this section.

2.1 System Parameters (Inputs and Outputs)

The program should ask the following parameter at the beginning of the program

- The length of the raceway (the number of columns) (10<= length <= 16)
- The width of the raceway (the number of rows) (6<= width <= 10)
- The number of transition cell at one column (1<= tcell <=3)
- The time given to the user to memorize the raceway(board) (10<=t<=60)

After selection of the parameters, the system will generate a random raceway based on the given parameters. Then, the board will be displayed for t seconds. Afterwards, the board will disappear.

In 10 seconds, the user will start to find the transition cells in each column. Whenever the user makes a true prediction, he/she will gain a chance to make the next prediction. If he/she fails, the race will end. At the end, the system will save the following parameters:

- The time to complete the raceway
- The number of true predictions
- The name of the user
- The point of the user
- All the input parameters

In each play, the user will be given one JOKER. If the user could not remember the place of next transition cell, he/she will use his/her JOKER to open it.

2.2 Points and Score List

To calculate the score of the user, you should use the following equation

((The length of the raceway + the width of the raceway) * the number of transition cells)) / (the time required to memorize)

2.2 Interface

The board should be displayed by using underscore character " _ ", hypen " - " or vertical strip " | ".

0	0	1	1	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1
0	1	0	0	0	0	0	1	0	0

Fig.2 The randomly generated raceway

*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*
*	*	*	*	*	*	*	*	*	*

Fig. 3 The initial state of the raceway

0	0	*	*	*	*	*	*	*	*
0	0	*	*	*	*	*	*	*	*
1	0	*	*	*	*	*	*	*	*
0	0	*	*	*	*	*	*	*	*
0	0	*	*	*	*	*	*	*	*
0	1	*	*	*	*	*	*	*	*

Fig. 4 The second round look of the board

0	0	1	1	0	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	1	0	0	0	0
0	0	0	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	1	1
0	1	0	0	0	0	0	1	0	0

Fig. 5 A fully completed board

0	0	1	1	1	*	*	*	*	*
0	0	0	0	*	*	*	*	*	*
1	0	0	0	*	*	*	*	*	*
0	0	0	0	*	*	*	*	*	*
0	0	0	0	*	*	*	*	*	*
0	1	0	0	*	*	*	*	*	*

Fig. 5 A board look with a mistake

The user should also see the score board of the player. You should display the score and time in descending way. All the information should be stored only during the execution of the program.