جامعة الأخوين

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AL AKHAWAYN UNIVERSITY

Project 3: Bust the Ghost

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I. Project Objective:

The aim of this project is to build a game called Bust the Ghost which is in the form of a map with the size of (8 * 20) cells. The ghost gets placed randomly in one of the cells of the grid and the user should try to bust it using the displayed probabilities. When clicking on a certain cell, it gets display by a certain color which helps the user to know how far they are from the ghost.

II. Logic used to build the project

This project is built using Unity along with codes written in C#. The scripts in the project are divided into 5 parts.

- Tile.cs: This represents a graphical unit which represent a tile or a cell that may or may not contain a ghost.
- WinLose.cs: This file has functions that do terminate the game, either by winning or losing (It does also display some images when the game is ended).
- GameOverScreen: Determine if the game is over or not.
- ProbabilityText.cs: This part of the code does display the updated probabilities after each click on the board.
- Game.cs: Contains the necessary functions for running the program (including the functions that help us inference using probability.)

This project is based on inferencing using probabilities. Basically the position of the ghost is randomly given by the program using a function called “placeGhost()”. In addition, there is a function that detects the position of the ghost and assign the corresponding colors for cells in the grid once they are being clicked on. Determining the color of a certain cell after randomly setting the ghost somewhere is done by calculating the distance between that tile and the ghost. The probability that helps determining the color, which this project is mainly built on, is the Bayesian inferencing method.

The Bayesian inferencing equation is used to determine the posterior probability of the ghost, the exact equation we used is **P(ghost) = (JointProbability(color, distance)*P(ghost | click)) / P(color)** and the Probability of color **P(color) = NumberOfColoredCells/160**. “160” is the total number of cells/tiles that we have.

III. Demo Video

Link: https://www.youtube.com/watch?v=Ygh5nJ8l3_o