CSE362/CSE5058 Artificial Intelligence Project 1

Due: April 24th, 2022 until 12pm

Prerequisites

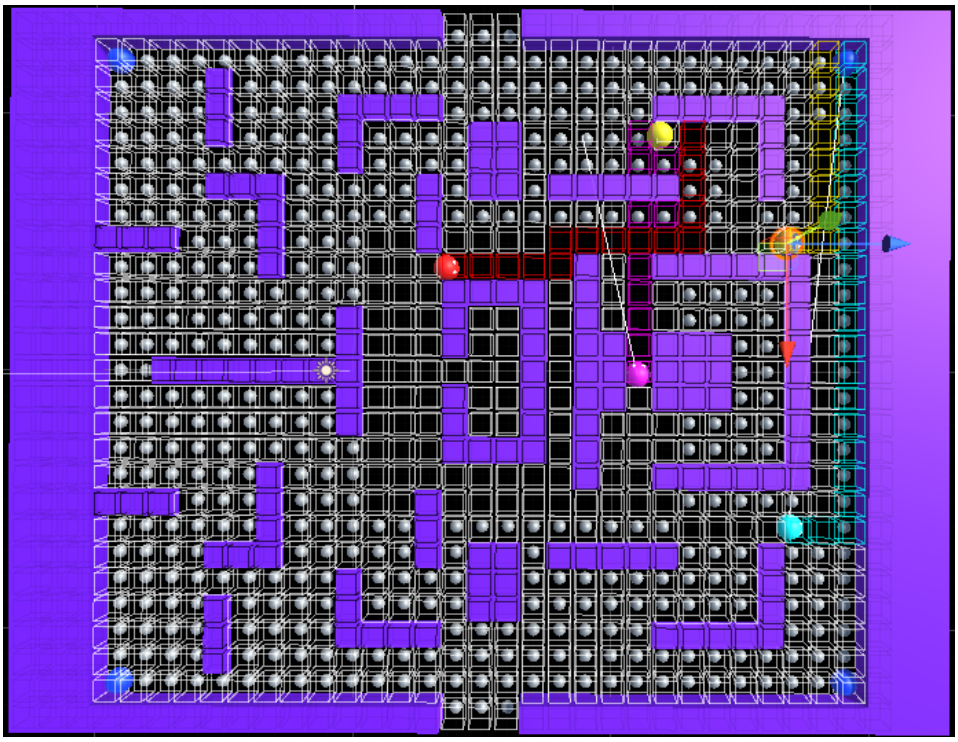
Before you can start working on this assignment you will need to install C#, Unity Hub and required Unity Editor version.

1. Install C# if it's not already installed
   Choose only a or b.
   a. Installing through Visual Studio
      - Download Visual Studio Community: https://visualstudio.microsoft.com/downloads/
      - From Visual Studio Installer choose *Game development with Unity* option for minimal installation. With this option you don't need to download Unity Hub.

   b. Installing without Visual Studio
      - Download .NET SDK and install: https://dotnet.microsoft.com/en-us/download
      - **If you are going to use VS Code as your script editor, don't forget to install C# extension.**
2. Install Unity Hub if it's not already installed (If you installed C# through option a, you don't need to do this step): https://unity.com/download
   a. You do not need to install recommended Unity Editor. When prompted, skip the editor installation process.
3. Install Unity Editor 2020.3.5f1: https://unity3d.com/get-unity/download/archive
   a. From the link click the section named *Unity 2020.x*
   b. **Find Unity 2020.3.5f1** and install through *Unity Hub* button
      - From the pop up you don't need to check **anything**. Press Install.
4. Open project from Unity Hub
   a. Extract the project zip you are given.
   b. From the Projects section in Unity Hub click *Open* button and choose *Pacmann* folder inside *PacmanHomeWork-main* folder. If you need to choose which editor to open with, select 2020.3.5f1.
5. If you need to choose an external script editor, click *Edit > Preferences* and choose your script editor.
6. From the file structure at the bottom left, open *Assets* and click to *Scenes*. From those four scenes double click to *PacmanLevel.unity*. You can move around with *right click + wasd*
7. Click to *Scripts* from the same file structure and open *PathFinding.cs* file. Inside this file, you will see a method with *AStarAlgorithm* name. You will write your code under this method.

Project Definition

In this project, you are required to implement the A* path finding algorithm. Figure 1 illustrates the working state of the Pacman project.



To-Do

You are given a working Pacman project with path finding method excluded. In this assignment you will need to implement A* algorithm and write your implementation inside a method given to you with method signature:

void AStarAlgorithm(Node startNode, Node goalNode)

Modify the *PathFinding.cs* script file to meet the requirements described above. To understand methods and classes you might use, you can explore *Node.cs and Gridd.cs* files. *PathFinding* script file is located under *Assets -> Scripts* folder. Create a PDF report describing A* and your effort in this assignment. Furthermore, test your application and include your findings in your report.

To-Submit

Only submit the *PathFinding.cs* file and your report in PDF format. Do not upload the entire project folder. Submitted file should be an archive (tar, zip, rar, etc.) named as your id-name-surname (e.g. 202051056016-berk-ercin.zip). Submit your own work.