**Artificial Intelligence**

**Project 1**

| Topic |

**Searching**

by

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1. **Overview:**
2. **Environment:**

* Python 3.8, with graphical library:

+ *pygame* library

* Divide the problem into small object:

+ Ghost

+ Pacman

* Using Object-Oriented-Programing

1. **The degree of completion:**

|  |  |  |  |
| --- | --- | --- | --- |
| **No** | **Specifications** | **Scores** | **Degree of completion** |
| **1** | Finish level 1 successfully. | **15%** | **100%** |
| **2** | Finish level 2 successfully. | **15%** | **100%** |
| **3** | Finish level 3 successfully. | **10%** | **100%** |
| **4** | Finish level 4 successfully. | **10%** | **100%** |
| **5** | Graphical demonstration of each step of the running process. You can demo in console screen or use any other graphical library. | **10%** | **100%** |
| **6** | Generate at least 5 maps with difference in number and structure of walls, monsters, and food | **10%** | **100%** |
| **7** | Report your algorithm, experiment with some reflection or comments | **30%** | **100%** |
| **Total** | | | **100%** |

1. **Assignment plant:**

|  |  |  |
| --- | --- | --- |
| **Student** | **Job** | **Scores** |
| Mai Đăng Khánh  18127118 | Graphical demonstration | 10% |
| Pacman in level 4 | 5% |
| Demo and testing | 15% |
| **Total** | **30%** |
| Huỳnh Nhật Nam  18127014 | Level 3 | 10% |
| Writing the report | 15% |
| **Total** | **25%** |
| Nguyễn Phúc Thịnh  18127223 | Ghost in level 4 | 5% |
| Create maps | 10% |
| Fix bug in level 2 | 5% |
| **Total** | **20%** |
| Phạm Vũ Duy  18127092 | Level 1 | 15% |
| Level 2 | 10% |
| **Total** | **25%** |

1. **Algorithm description:**
2. Level 1 and 2:

* Using A\* to find the path to the food.
* A\* is chosen because:

+ It always find the a solution if it exist

+ A\* on expands to the node that it seem promising. By doing this, A\* will try it best to find the fastest path to the goal

+ In these level, there is only one food or one goal. And the A\* is optimal to find solution in problem with just one goal

+ In level 1 and 2, we know the location of the food. And the problem will become *informed search* not *uninformed search* like level 3 and 4. This is why *Dijkstra's algorithm* is not chosen

+ A\* combine with *Manhattan heuristic* will give us the optimal solution because *Manhattan heuristic* is admissible

1. Level 3:
2. Level 4: