**Project 1**

**Artificial Intelligence**

**CSCE 5210 – Fall 2021**

**Distributed: Tuesday, August 31**

**Due: Tuesday September 21**

**Approach:**

Given variables:

* The map of a ware house can vary. However, it should be a 2d array list. Specifically, our team chooses a 2d numpy array because of the convenience in accessing a grid square even though the benefit is not so clear compared with a general list when it is mixed between int and string
* The order: We assume that it is a list.

Data structure: list

* + The first layer:
  + Data structure: tuple
    - Shelf: The name of the shelf
    - Details: It contains all items that can be found in the specific shelf
      * Data structure: list of tuples
      * Each tuple has:
        + Code of the item
        + Quantity of the item

Class Robot:

Attributes:

* The map of the warehouse
* Order: The leftover of an order the robot needs to proceed
* Items: Items the robot has collected so far
* Around: This shows the respective directions of the robot’s immediate neighbor grid squares (west / east / north / south) that have the shelf which is included in the order (0 = No, 1 = Yes)
* X and Y positions of the robot in the ware house
* Initialization
* go west / east / north / south and update the robot’s position after each move
* peak around for shelves
* get\_items when the robot gets to the shelf included in the order
* proceed\_order: The algorithm of the robot’s processing phases

**Report:**

Assumption:

* The robot’s capacity is unlimited that it can collect all items in an order without going back to the starting point after picking items from one shelf
* The robot will complete one order before handling another

1. It can be found in the code
2. It can be found in the code
3. It can be found in the code
4. Demonstration: It is included in the approach part
5. Reason 1: The difference between the map of a ware house to another. You can finish the job if all the shelves in the order are clustered close to the point P if you are lucky enough

Reason 2: The randomness of the robot’s choice when there is more than one neighboring shelf or no shelf

1. Data structure: It is included in the approach part