Thank you for taking part in the testing process. DISCLAIMER: Please be aware while you answer these questions:

The program is in Beta Testing. Bugs are present and are known. Please try to ignore obvious bugs as much as you can. There are a few graphical bugs/glitches which would be solved with the addition of animation, for example.

The focus on this project is the artificial intelligence (AI) systems. The program’s UI, art work, and other general program systems such as lack of animations are immensely underdeveloped. Please answer these questions with thought only on the AI and not on the artwork, or lack of other engaging systems which would otherwise be in place in a fully developed program.

1. General Concept Feedback

1.1) Imagining a fully developed, intelligent program which allows users to create very complex and fully customizable maps and scenarios, do you think that with enough development this program can be used as a good tool to train shop employees to allows them to experience unique scenarios and optimize their customer service skills? Please explain reasons for your response.

Yes, I think when fully developed, this program could help to train employees and enable them to experience an array of customisable scenarios. As the shop layout, customers and employees can all be customised to suit the applicable scenario, it would benefit employees from enterprises of all sizes.

1.2) If you and think that both the concept is good, and this program can be used a good baseline, and you did not cover it above, please describe why.

This has the potential to be a fantastic tool to be used be any type of enterprise, not just in retail. It could be personalised to demonstrate and simulate an office environment with employees of different departments working together.

1.3) If you think that the concept is good, but this program is not a good baseline for further development, and you didn’t cover it above, please describe why.

1.4) If you think that the main concept of this program is bad, and that this idea couldn’t be developed well, and you didn’t cover it above, please describe why.

1. General Artificial Intelligence (AI) Feedback

2.1) Please describe your thoughts on the general AI used in the program? Please think about the decisions they made, and compare their decision to ones you would typically see in real life.

The characters chose a variety of products, instead of choosing a large number of the same product. This was realistic, and showed that the AI was programmed well. The characteristics or traits of each character was an interesting addition, which I did not expect when first finding out about this project.

2.2) Did the AI seem simple, and not very smart? If so, please describe how you came to that conclusion, and maybe some suggestions for making the AI seem more realistic. If you think the AI was smart, and it did seem to make some good decisions, can you pin point why it seemed smart, and if there is anything that can improve it even more?

The AI was smart to choose a variety of products, and talk to some characters, but not all. They moved out of the way of each other when crossing paths and when faced with the trolley being in their path.

2.3) If a trolley was in a character’s way, they were programmed to find the nearest free tile from the trolley that wasn’t in their way and then move the trolley there. Did you notice this behaviour? If you did, did you think it looked realistic?

There were cases where the trolley was in the way of customers, and although I couldn’t tell whether the customer or the employee moved it, it was moved so that the customer could get past. The most realistic way to program this in the future would be to have the employee move it out of their way. If the customer had to move the trolley, perhaps the customer’s traits could become more angry or annoyed.

1. Employee AI Feedback

3.1) Do you think that the employees made good, and realistic decisions? Please describe how you came to your conclusion.

The employee named James was moving and replacing stock which at most times was necessary, however there was at one point upwards of 100+ items being restocked on the trolley when only a few customers had come in so far during the allocated time. What was realistic, however, is that the employee restocked the items in large quantities, instead of restocking each individual item that had been purchased. I did notice the employees talking to customers at suitable times, for example Michael talking to customers at the checkout, and James talking to customers as they ask to get past him. This was a great addition to the simulation.

3.2) The employees were programmed to get out of the way of a customer if they were asked to move. Did you notice this? If you did, did you think it looked realistic?

I did notice that employees moved out of the way of customers, namely James when he was working on the front shelves in the second half of the simulation. It took a little while for him to move, however once he did, the customer was able to continue their path through the shop.

3.3) Could you describe any ways that the employee could be made more intelligent?

The aforementioned talking between customers and employees is very useful in this simulation, but what could be a great next step is to have employees ask customers around the shop if they need any help with anything, or if there are any items they cannot find. The employee could then take the customer to the requested item.

1. Customer AI Feedback

4.1) The customers were programmed to pick up the items they needed and then head to the checkout. If another character was in their way, they would wait 5 seconds, and then try and find a way around the character, if both of those failed, they would ask the character to move. Did you notice this behaviour? If you did, did you feel that it looked realistic?

I did notice the wait time of 5 seconds, and that the customer would try and find a way around another character. This worked well with a customer-to-customer interaction, however with a customer-to-employee interaction, the customer would not move around the employee. Instead, they would wait 5 seconds and ask the employee to move, which he would. This was quite a realistic behaviour, however in order for it to be more realistic, the employee should move out of a customer’s way without being asked.

4.2) Could you describe any ways that the customers could be made more intelligent?

There was one incident of a customer pile-up, whereby around 15 customers were stuck and unable to move past one another. This, however, is something that can be excused for as this program is in its beta stage and bugs are expected at this stage.

1. Relationship AI Feedback

Subtle relationship behaviour was programmed into the characters. If they found themselves next to another character they had a good enough relationship with they would say help to them, then they would choose to have a conversation with that character. Depending upon what they talk about, and the traits of the characters that are talking, the characters’ relationship with each other would either increase or decrease.

5.1) Did you notice any conversations taking place? If you did, did they look realistic? Is there anything that would make it look more realistic?

The conversations were realistic, as they would only occur when two characters are next to each other, not when they are far apart or on opposite sides of furniture. In order for it to be more realistic, perhaps the characters’ traits could be influenced by the conversation, e.g. happy, annoyed, etc.

5.2) Can you think of anyways to make it more clear when characters are conversing? Such as speech bubbles above their heads, or happy and sad faces appearing when they gain or lose relationship.

Speech bubbles would be a great idea to show that they are conversing, with the addition of happy, neutral or sad faces at the end of the conversation depending on how strong their relationship is and what their traits are.

1. Traits AI Feedback

6.1) All the characters have their own personal traits such as friendly, and lazy. These traits were used to affect how characters interacted with each other, as well as certain attributes associated with the characters such as their maximum speed etc. Did you notice these traits? If you did, did you feel like they were used in a realistic way? Is there anything that could be further developed with the traits to make the character more realistic and interact with each other in a more realistic way?

I did not notice much difference between the characters other than their speed walking through the store. I feel like the traits could be emphasized more with the addition of how customers interact with each other – perhaps if two people with the same trait are conversing, it could affect or have an influence on people nearby?

1. Pathfinding Feedback

The pathfinding is the first step in any advanced AI system. The system in this program uses the A\* pathfinding algorithm which is the fastest and more optimal algorithm currently developed.

7.1) Do you think that the characters took realistic paths to their destinations? Sometimes if the AI takes the most optimal path, it may look unrealistic so keep that in mind. Please explain your answer with examples of why or why not you agree.

Most people do follow the same path when in a shop, particularly a food shop. This is demonstrated through the customers’ pathfinding. If some customers only needed items from the big freezers on the right, however, it might make more sense for them to go straight there without first going up and down each aisle of front shelves and big fridges.

1. Additions added to AI in possible further development

There were a few systems that could have been added into this program given more time to fully develop them. After describing them, please give your feedback on whether these systems would advance the AI and make the character more realistic.

8.1) Line-Of-Sight was the first thing to be implemented given more time. Currently all the characters have a full awareness of the entire world, they can find any item on any shelf, and find any character in the world even if they are very far away. With line-of-sight, systems could be developed and added which allows characters to need to walk tile by tile and search for their needs. They would also be able to ‘see’ other character that are not next to them and engage with them in a more realistic way. Do you agree that line-of-sight would advance the realism and intelligence of the AI considerable? If you do not agree, please explain why, and perhaps suggest your own ways the AI could become more realistic in terms of knowing things about their environment.

I agree that being able to ‘see’ other characters that are not next to them and being able to engage with them would be more realistic. However, I personally disagree with the notion of using line-of-sight for needing to search for each item – many people use the same supermarket each time and have a good idea as to where most products are located. Perhaps line-of-sight could be used only once the customer has got to the correct aisle?

8.2) Linked closely with line-of-sight; partially explored pathfinding algorithms could be developed. The idea behind this is that currently, a character can make a perfect path from any tile to any other tile, even if it is 100s of tile away. This is because they can ‘see’ the entire map. Partially explored pathfinding would mean that characters would have a blank view of the map and only know about other characters and furniture if they see them using their line-of-sight. This would create a realistic looking pathfinding system which could take characters down dead-ends and non-optimal paths, which is impossible with full map awareness. Do you agree that partially explored pathfinding algorithms would create a more realistic looking pathfinding AI? If not, why do you disagree, and can you think of any ways to create a more realistic pathfinding system?

This would be a great addition if used for only a percentage of the customers. As aforementioned, many customers often use the same supermarket or shop multiple times and so have a rough idea of the layout already. However, if this idea of partially-explored pathfinding algorithms were to be used for a few of the customers, this could represent a very likely scenario. This would also enable employees to interact with these customers more to offer advice.

8.3) Please think about other ideas and concepts that could be added into the program to create a more realistic AI. Maybe talk about it at a general level and if you can, go into details about possible ways to implement the ideas. The box is a lot larger than the other. Please do not feel like you must fill the entire box. Any amount of feedback here is fine.

More development of the way people interact with each other based on their traits could be an interesting aspect to take into account. This would enable the simulation to show how people realistically interact with each other depending on whether they have positive or negative traits associated with them. For example, if an angry customer were to come into the store, how would that affect other customers, and how would the employees react?

The environment could have situations happen in it whereby employees have to react. For example, if a customer were to drop or spill an item that needed to be cleaned up, it would influence the relationship and current task performed by the employee.