ITAI 4373 – The New Nature of Work in AI

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**Lab: Exploring AnyLogic Through Simulation: A Reflective Journal**

**(Bank Office Simulation model)**

**Introduction**

I chose the AnyLogic Bank Office simulation tutorial to gain practical experience with discrete-event modeling. This tutorial simulates the customer flow in a bank office, from arrival to service, and focuses on optimizing resources like tellers. Given my interest in AI applications for real-world systems, the scenario felt relevant and practical for understanding resource management in a bank setting.

**Learning Objectives**

My primary goal was to learn the basics of AnyLogic software and how to build a basic agent-based model and simulate workflows using AnyLogic. I wanted to explore how customer arrivals, service times, and available resources interact to impact system performance. Additionally, I aimed to become more familiar with the AnyLogic interface.

**Step-by-Step Reflection**

* **Step 1: Setting Up the Environment**: I started by designing the layout and adding customers and tellers as agents. The step was simple, though it required attention to ensure all components were logically placed.
* **Step 2: Configuring Customer Flow**: Using the ‘Source’ block, I defined customer arrivals at random intervals, representing variability in real-world scenarios, such as different times of day.
* **Step 3: Setting Up Tellers**: I created tellers and used the 'Service' block to control service times. This was key to managing customer wait times, as adjusting the parameters/properties significantly influenced the flow.
* **Step 4: Running the Simulation**: I observed how queues formed and how tellers handled customer demand. I also observed that the number of customers using the ATM and going to the tellers was the same because we had input this condition in properties.

**Challenges**

The biggest challenge for me was that I started encountering an error when I was running my simulation at the end. It was that time was somehow not completely accounted for. I went back and compared all my steps to the tutorial but still couldn’t find out what was wrong. I was able to run my simulation for a little amount of time before that error occurred.

**Insights**

This tutorial showed me the impact of small parameter changes on overall performance. The use of queues to handle customer demand was particularly interesting, as it highlighted the importance of efficient resource management.

**Key Takeaways**

I learned how to build and modify agent-based models, and how changes to individual components affect the entire system. This skill is crucial for analyzing real-world systems in different industries.

**Final Model**

My final model simulated a bank office with four tellers and tracked customer wait times and resource utilization. It also showed a 3d model where you could see customers waiting in queues to use the ATM or to use the Teller services. The final model represents an efficient system for managing customer service.

**Conclusion**

This tutorial provided a strong foundation in simulation modeling. It enhanced my understanding of how agent-based models can optimize workflows, and how these principles can be applied to real-world scenarios like healthcare, logistics, or a bank like in my used example.

**Screenshots and Key Points (not in a particular order)**

**A screenshot of a computer

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My model (in progress) in the AnyLogic software

**A screenshot of a video game

Description automatically generated**

Customers in queue to use the services, the red and green dots represent who is being served at the moment and who is available**A group of people standing next to a green and white object

Description automatically generated**

Tellers (Office workers) and tables (3d objects) in the 3d simulation

**A couple of people walking next to a green box

Description automatically generated**

Customers using the ATM machine

**A video game with people walking

Description automatically generated**

Customers using the Atm machine and the Teller services **A screenshot of a computer

Description automatically generated**

Customers (3d animation)

**A computer screen shot of a diagram

Description automatically generated**

3d window at the bottom and Main

**A screenshot of a computer

Description automatically generated**

Path and node in 3d animation

**A screenshot of a computer

Description automatically generated**

Rotating the path and node using the shift key in 3d animation

**A screenshot of a computer

Description automatically generated**

Building a simple queue model

**A screenshot of a computer

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Ran into an error when used visual simulation

**A screenshot of a computer

Description automatically generated**

Inspect window

**A screenshot of a computer

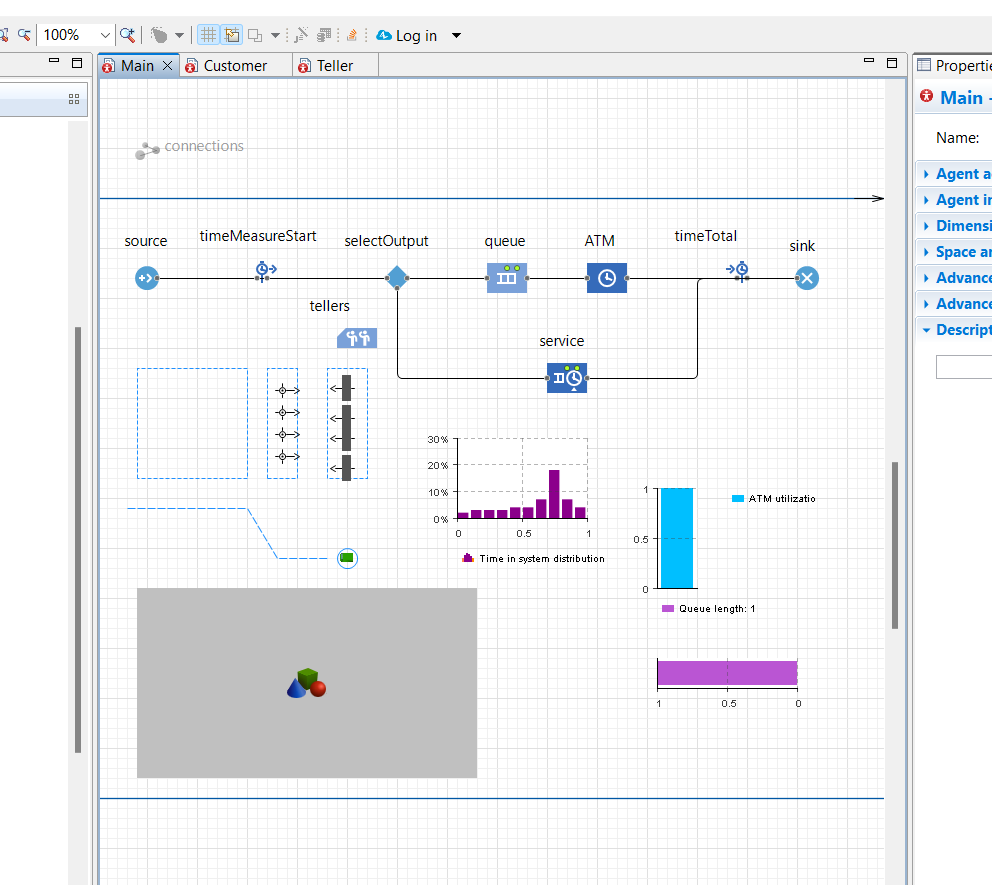
Description automatically generated**

Queue model, path, and node in Main

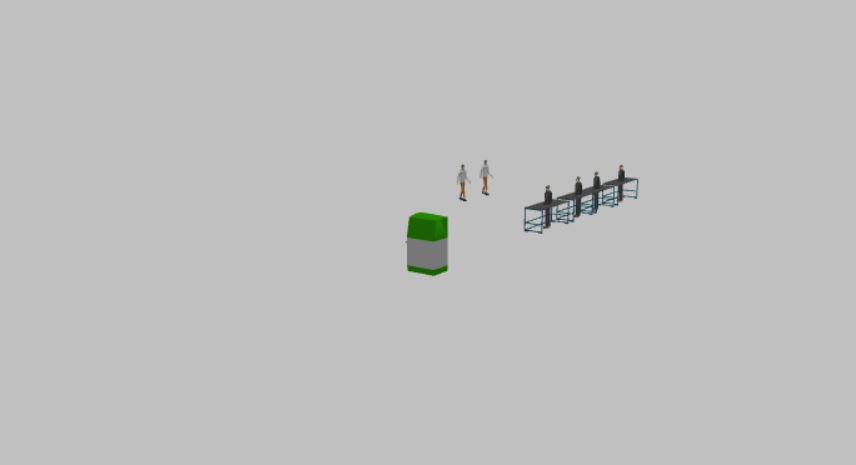
**A screenshot of a computer

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Running the simulation of the simple queue model

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Final model in Main



Final model (3d Animation)

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**Citations**

1. <https://anylogic.help/tutorials/bank-office/index.html>