5-2 Milestone: Enhancement Three Narrative

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1. Briefly describe the artifact. What is it? When was it created?

The artifact is the final project from CS 330 Computer Graphics and Visualization. It is a partially interactive 3D environment based on an image I selected at the start of the course, which in my case was a table setting of a meal. It was created in June 2023.

2. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?

I chose this artifact because my interest and career goals revolve around automated and autonomous systems. 3D environments can serve as a testing ground for various automated systems in a virtual environment before attempting to push to a live model. The initial enhancements were to create a randomly generated environment for testing object detection, as well as an intelligent agent that roams the environment and detects objects and outputs flagged object coordinates in the console window. This week I added database functionality where flagged object coordinates are passed to a csv file that is then used with python to create a data visualization heatmap. I feel this improves the original artifact by expanding beyond the original static setting into a more complex animated setting with intelligent agent decision making and database visualization, and it showcases an ability to create complex designs and solutions.

3. Did you meet the course objectives you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?

I feel that I exceed the planned enhancements from module one. I initially only planned to store the flagged object coordinates in a database, but as was pointed out to me, this was not complex enough to meet the requirements. Instead I use multiple languages to pass the data to visualization tools in python. At the moment I have no update plans. There is complexity and functionality I would like to add but these things are outside the scope of the requirements and

would likely take too long to implement. I believe the enhancements are good as is, though that will depend on feedback.

4. Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?

By far the most difficult part of this enhancement was the setup needed to use python within cpp. About half of the time spent this week was on setting up the libraries and modules needed, and then testing basic python scripts to ensure functionality. After that, a significant amount of testing was required to make sure I implemented the heatmap and shared data between the two languages correctly. For all the simplicity of the final additions to the code, there was a lot more going on behind the scenes.