**Directions:** Use this document to submit your screenshots and written responses to Tool Dev 6. Choose one of the challenge options (Socket Programming, HTTP Exploration, or Mini Tool Builder). Paste your code output screenshots and answer the reflection questions below. To receive full credit, ensure your script is properly commented at the top and throughout, and include screenshots of your script outputs where requested in the lab instructions.

**NOTE: These scripts will need to be pushed to GitHub. If you have reported issues uploading to GitHub, submit your script & document in zip format & please remind me when submitting to BrightSpace**

## Option 1: Socket Programming Scenarios

**Paste your screenshot(s) below**

A screenshot of a computer program

Description automatically generated  
  
**Reflection Questions:**

1. What are the practical benefits of introducing a delay in the server response?

**Introducing a delay in the server response can be helpful for several reasons:**

**Simulating real-world network latency: In actual networks, servers don’t always respond instantly due to traffic or processing delays. Adding a delay helps in testing how the client handles slow responses.**

**Rate-limiting requests: Some servers introduce delays intentionally to prevent overwhelming their system with too many requests at once.**

**Debugging and Testing: If responses come back too quickly, it might be harder to test how the client handles different conditions. Adding a delay lets us inspect client behavior, ensuring it doesn’t break under slower connections.**

2. How does changing the port number from 12345 to 9090 affect the way you test or interact with the server?

**Changing the port number alters how we access the server because:**

**Different services use different ports: Some ports are commonly used for specific services (e.g., HTTP typically runs on port 80, HTTPS on 443). Changing the port ensures our program isn’t conflicting with another application.**

**Firewall and accessibility: Some networks block certain ports for security reasons. If 12345 is blocked but 9090 is open, switching ports can make the server more accessible.**

**Standardization: Some developers prefer using specific port ranges for organization. Port 9090 is often used for web-based applications, making it a more predictable choice.**

3. In your own words, how does the client know the server received the message and responded correctly?

**The client knows the server received the message if:**

**The server sends a response back: The client sends a request and waits for a reply. If data is received, we know the server processed the request.**

**No error occurs: If the socket connection remains open and no error messages appear, it’s a good sign the message was successfully transmitted.**

**Correct response format: The server should return expected data (e.g., a confirmation message or processed information). If the response matches what we expected, we can be confident the communication was successful.**