

Anup Jasani (momesmo@vt.edu)
Kenta Yoshimura (yoken@vt.edu)
Nhan Pham (pnhan@vt.edu)
John Stradling (jstrad@vt.edu)

ECE 4564 Assignment 1 – Group 16

Project Overview

The purpose of this design project was to further our knowledge with the Raspberry Pi using sockets in python and API's from both Wolfram Alpha and Twitter. The project requires two Raspberry Pi's where one will be considered the client and the other will be the server.

Design Process

The client will first receive a tweet using the tweepy streamlistener and filter out unnecessary information so that the question, ip address, port number, and tweet ID can be saved. The client will then develop a checksum and package both the tweeted question and checksum value using a tuple. Finally, the client will pickle the information and send it over to the server.

The server first de-pickles the received tuple so the information inside the tuple can be accessed. Before the twitter question is processed, the server performs a verification on the checksum value that was sent to make sure that the information in the tuple was sent correctly. If the values do not match, an error is sent to the user and the server terminates the request. If the server verifies the information, the twitter question is then sent to the Wolfram API and waits for a response. To ensure no errors, the server only accepts text answers back. Once an answer is received back from the Wolfram API, the server then develops a new checksum value and packages the answer and checksum in a tuple. The tuple is then sent back to the client using pickle.

The client will then receive the pickled tuple, and de-pickle the information. The client will then verify the checksum value that was sent from the server to confirm the information is valid. The client will then finally take the answer, construct the tweet with the correct handle and tweet ID, and tweet it out using the twitter API.

Team Responsibilities

We divided up our work by sectioning off portions for the design process to each member. John and Kenta were in charge of getting the server working with WolframAlpha, to make sure that the question was being sent correctly and an answer was being received back. They also made sure that the client and server could connect and send pickled information. Anup was in charge of getting the Twitter API working so that our client would be able to receive a question via tweet and then send it over to the server. Daniel was in charge of getting the checksum working

for verification of correct questions and answers and also in charge of incorporating tuples when data was being sent to or from both the client and server. Whenever running into issues with any section we would collectively work on it to resolve the issue.

Conclusions

One of the original problems our group had run into was how to treat errors from the Wolfram API. We had set the code to only accept text answers. However, some questions that you can ask Wolfram will not produce a text answer. We had to develop error catches in order to account for this and make sure that the server would not terminate if it had received an error from the Wolfram API.

The project works to the specifications listed on the assignment slides. Besides minor coding errors and missing packages in python 3, no serious issues had arisen. The project was very interesting to us and helped us learn more about the Raspberry Pi and how to work with sockets and API's.