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Preliminary Final Project Proposal

What I plan to do: *Leveraging Serverless Computing for Chatbots to Perform Natural Language Processing*

We plan to make a chatbot for either Facebook Messenger that is built using a serverless technology stack, specifically AWS Lambda. A chatbot seems like an excellent candidate for going serverless due to the high amount of idle time of the application, the existence of a clearly defined ‘trigger’ (the sending of a message into Messenger), and a plethora of third-party vendors providing free NLP chat services to developers such as Wit.ai or DialogFlow (eliminating much of the required logic that would otherwise need to be implemented in a long-running server). Additionally, we will utilize NLP models to test whether AWS Lambda is a suitable framework for running machine learning models.

To ensure our chatbot is useful, we will have it focus on public transportation in NYC by utilizing NLP techniques and the completely free MTA API to process user input.

In order to measure the success, viability, and financial considerations of this chatbot, we will also build a similar chatbot the traditional way and host it on Heroku (not using serverless technology). We will compare and assess the difficulty that is required for engineers to build the product, the technology limitations, and the financial considerations.

How it's relevant to software engineering:

Partly due to the widespread adoption of mobile phones and other smart devices, there has been a precipitous increase in the number of software chatbots. Chatbots are even starting to appear as the primary service in products like Apple's Siri, Microsoft Cortana, and Amazon Alexa.

This project will provide insight into whether AWS Lambda (and other serverless technologies) are a viable platform to host machine learning and natural language processing models. For software engineers, this project will help guide design decisions in similar

domains, allowing engineers to make better decisions over whether or not to host their application on a serverless technology.

Why I'm interested in the project:

Justin Zwick: I studied serverless architecture for my midterm project, so I wanted to continue to learn more about it and apply it to an actual project. I feel like chatbots are becoming very popular in the past few years and this could be an interesting and useful way of applying what I've learned and also discover more about how chatbots work so I can build some for personal uses in the future.

Sam Kececi: I am super interested in serverless technology, especially as it has begun to receive widespread adoption in industry. At the same time, there is still a lot of experimentation and research necessary to figure out what applications are best suited to this serverless architecture. This project will allow us to examine the challenges and advantages of this rapidly growing aspect of software engineering, while also combining it with NLP and machine learning.