Matthew Zhou

# Final Project Proposal

## Azure SQL Database

Azure SQL Database is Microsoft's cloud version of their SQL Server database engine, supporting Transact-SQL. It is a fully managed platform, meaning that it handles all the upgrading, patching, backups, and monitoring without help from the user. It has a SLA of 99.99% availability and allows for scaling and integration with other Azure services such as Azure Functions. There are two deployment options: single database, and elastic pool, which is a collection of single databases with a shared set of resources (CPU/memory). There are two purchasing models: vCore-based – allows users to choose the amount of vCores, memory storage individually; or DTU-based – which bundles compute, memory, and I/O to simplify the provisioning for lighter workloads.

## Azure App Service

Azure App Service is a HTTP-based service for hosting web applications, REST APIs, and mobile backends. It supports multiple languages and provides security, load balancing, autoscaling, and automated management. To deploy a python web app to Azure App Service, one can create a Flask app in python, and then use the Azure CLI to create a web app in Azure. This automatically creates a resource group, creates a default App Service plan, and zips all local files. It can then automatically recognize the app as a Flask app and deploy it at http://<app-name>.azurewebsites.net. Logs can also be viewed using the CLI. This quick deployment allows for rapid development and high availability, with a SLA of 99.95% availability.

## Azure Functions

Azure Functions is a serverless solution to allow users to execute event-driven code. It supports multiple languages and provides integration with other services such as Azure SQL Database and Azure App Service. Events can be HTTP requests, messages from queues, database updates, or cron jobs. The Azure Functions Core Tools allows users to create functions in a local environment and then deploy functions to Azure.

## Project: Crossword Assistant

I plan to create a Crossword Assistant to help players improve at solving Crosswords. This is done by getting popular clues for a given crossword. I plan to get past crosswords from NYT Games and store all clues in Azure SQL Database. This will allow me to aggregate on commonly used words and get the most common answers to these clues. I then plan to use Azure App Service to expose an API to allow users to ask for help for a specific crossword, where I look through clues for that crossword and return the commonly used clues existent in that crossword. I also plan to use Azure Functions to get the newest crossword every day at midnight.

## Cost Analysis:

I plan to use the DTU Basic Tier for Azure SQL Database, which costs $4.90 monthly. I plan to use one core and 1 instance of the App service. With an estimate of 100 hours of use, this will cost

$1.70. Since the first 400,000 GB/s of execution and 1,000,000 executions are free for Azure Functions, I anticipate no cost for this. This results in a total cost of approximately $6.60.