Statement of Work

## Team: Santa’s Little Helpers

### **Overview:**

All group members participated in the project selection, architecture refinement, and feature ideation phases of the project. This took place over several initial meetings outlined in the Project Timeline document. Moreover, all group members had little to no experience with Python, Flask, or web application development, and only one member had previous database experience (although not with Postgres -- our database of choice given its integration on Heroku). In light of this, all group members had to spend time learning Python and Flask syntax/functions/libraries/data structures. To do so, every group member developed their own working Flask website on their local servers. Additionally, all features developed by group members when through extensive refinement to meeting dynamic input/output and functionality requirements during the development and implementation of the application.

### **Individual Focus Areas**

Individual focus areas specific to the web application project are included below:

#### **Ben Leone**

**Technical Focus Areas**

* Deployment of web application on Heroku
* Creation and management of Postgres database
* Development of functionality to input data submitted on webpage into database
* Coordination with all project members on integrating and testing respective sections into application
* Coordination with Wiley on securing sensitive information (Passwords and Secret Keys) using Heroku configurations and environmental variables

**Additional Focus Areas**

* Documentation of meeting minutes which were incorporated into Project timeline
* Creation and maintenance of Group GitHub repository
* Refinement of Statement of Work document

#### **John (Wiley) Hunt**

**Technical Focus Areas**

* Extensive research on Flask web application development
* Owned development, refinement, and implementation of email bot function.
  + This step first required learning to use Python SMTP email functions
  + Second, the bot was refined to use basic Flask mail, which proved to not function correctly for sending multiple emails simultaneously (a key requirement for the application).
  + Two additional email bots were: One designed using Flask mail for bulk emails and another using “Threading” to send emails asynchronously. After extensive testing, it was decided that the asynchronous bot was the best option (as the bulk email bot, while reliable, caused the website to ‘hang’ until all mails were sent since the function simply kept the connection open while sending emails).
  + Separate programs were written/tested to send emails based on data in dictionaries, lists, and CSV files (as initially we were unsure how the bot would need to interact with the database).
* In addition to the bot, Wiley also researched and leveraged the Flask ItsDangerous package to develop a function to create unique URLs to each group member. This also required learning the Flask URLFor function to properly construct the links for these unique URLs
* Coordination with Ben on integrating and testing email function in master application
* Coordination with Ben on securing sensitive information (Passwords and Secret Keys) using Heroku configurations and environmental variables
* Coordination with Josh on leveraging the email bot for sending assignment/wishlist emails to group members (after their ‘partner’ filled out a wishlist page)

Additional Focus Areas

* Owned creation and management of Gmail account for email bot, including maintaining/changing passwords and configuring Gmail account to allow mail sending via Python scripts
* Assembly of meeting minutes and creation of Project timeline document
* Creation and refinement of Statement of Work document
* Refinement of Project Documentation document
* Coordination among group members to eliminate duplicate efforts (where possible)
* Project Video filming

#### **Josh Goldberg**

**Technical Focus Areas**

* Extensive research on Flask web application development
* Coordination with Panat on Graph algorithm design, and implementation
* Creation of object and classes pertaining to database and email management
* Research and development of functions to extract information from the database for distribution of emails
* Coordination with Wiley on leveraging the email bot for sending assignment/wishlist emails to group members (after their ‘partner’ filled out a wishlist page)

**Additional Focus Areas**

* Project Video filming
* Refinement of Statement of Work document

#### **Ken Krebs**

**Technical Focus Areas**

* Extensive research on Flask web application development
* Development of user interface including overall flow of web pages, user interface, and overall project aesthetics including overall determination of application structure and design for user interface.
* Web development using HTML of the three separate web pages with the accompanying CSS styling sheet for the front end design.
  + Debug the application for consistent functional use on mobile displays as well as smaller displays.
  + Optimization of the user interface for medium and large sized displays including creation of all graphics accompanying the webpages.
* Design pages to optimize the brand consistency throughout all user interactions.
* Coordination with Ben on overall front end aspect of the project including data inputs on the all of the webpages and correlation to output of data to backend and database.

**Additional Focus Areas**

* Project Video filming
* Refinement of Statement of Work document

#### **Panat Taranat**

**Technical Focus Areas**

* Extensive research on Flask web application development.
* Design and implementation of anonymity preserving random gift assignment algorithm. No person can infer the remaining gift assignments based on the fact that person *i* was assigned to give to person *j*.
* Runtime analysis
* System-level testing and security. Secured web app against SQL injection attacks and endless loops. Analyzed possible security flaws when storing sensitive information.

**Additional Focus Areas**

* Documentation (Project Architecture and Project Documentation)
* Software architecture and UML diagrams
* README.md documentation
* Refinement of Statement of Work document
* Project Video filming, editing, and posting on course YouTube page