Project Group 3 – Sprint 0

Trello URL: https://trello.com/b/ld3q8h04/sprint-0
Github link: https://github.ccs.neu.edu/chauda1/CS5500

User Stories

1. As a manager, I want to be able to plan employee schedules and increased/decreased staffing needs while taking into account the current climate of pandemic. I want the program to be adaptable and also able to be used once things return to normal.
2. As a manager, I want to be able to use this software when we return to "normal."
3. As a manager, I want to be able to have enough staff, so people don't wait in line for long during a lunch or dinner rush.
4. As an employee, I want to be able to know when to stock ahead if there will be more customers coming due to a holiday, so staff does not have to stock during operation hours.
5. As a manager, I want to be able to plan for increased staffing needs both the day before the holiday as well as the holiday itself.
6. As a manager, I want to be able to plan for increased staffing needs on weekends when average trip lengths are longer than during the week and customers may need more assistance.
7. As a manager, I want to be able to schedule for more employees in response to the weather.
8. As a user, I want to be able to easily manipulate the program by myself.

Initial Design

- Programming language: Python
    - External libraries:
        - Random – used to generate values for shopper time, time spent, etc
        - Statistics – used for means and averages
        - Csv – needed to generate csv files
        - Math – unused yet (will only be used for normal distribution)
        - Scipy – unused yet (will only be used for normal distribution)
        - Numpy – used for data analysis
        - Pandas – unused yet
- Inputs (given on the command line):
    - A date (datetime)
        - Can be changed to complete user input for month, day, year (string)
    - Whether or not the weather is nice (boolean)
        - If the weather is nice on a specific day
- Outputs:
    - CSV file for specific day containing one line per customer with:
        - The time a customer entered the store (float)
            - This is the hour in a decimal format on a 24 hour scale. For example, if a person enters at 0930, it would show as 9.5
        - The amount of the customer spent in the store (float)

        - Whether or not this customer was rushing (lunch, dinner)
        - Whether or not this customer was a senior
        - Whether or not it is a nice day outside
    - A secondary CSV file with statistics:
        - Total customers per day
        - Customers in store per hour
        - New customers per hour
        - Number of customers for lunch rush
        - Number of customers for dinner rush
        - Number of seniors
        - Number of customers at closing time
        - Average and standard deviation of time spent for customer in a particular category
- Major abstractions and relationships:
    - The holidays used in this software will be pulled from USA holidays from holidays package in python.
    - Certain percentages will be guessed and used. These will be provided if wanted and can be changed easily to take into consideration changes in shopping patterns and staffing needs.
    - Weather is currently defined as “nice” or not. This can be changed by the user in case of weather changes.
    - Abstraction: an individual shopper
        - Relationship: senior
        - Relationship: not a senior
    - Abstraction: weather
        - Relationship: nice weather
        - Relationship: not nice weather
    - Abstraction: day of the week
        - Relationship: a weekday
        - Relationship: a weekend
        - Relationship: a holiday
        - Relationship: a day before a holiday
        - Relationship: the week leading to a holiday