NANYANG
TECHNOLOGICAL
UNIVERSITY

CE1003 INTRODUCTION TO COMPUTATIONAL THINKING

MINI PROJECT REPORT

BY:

Kesarimangalam Srinivasan Abhinaya

Kong Cheng Zhen

Lee Lucius

Team 4 – CM1

TABLE OF CONTENTS

1. PROJECT OUTLINE

Aim

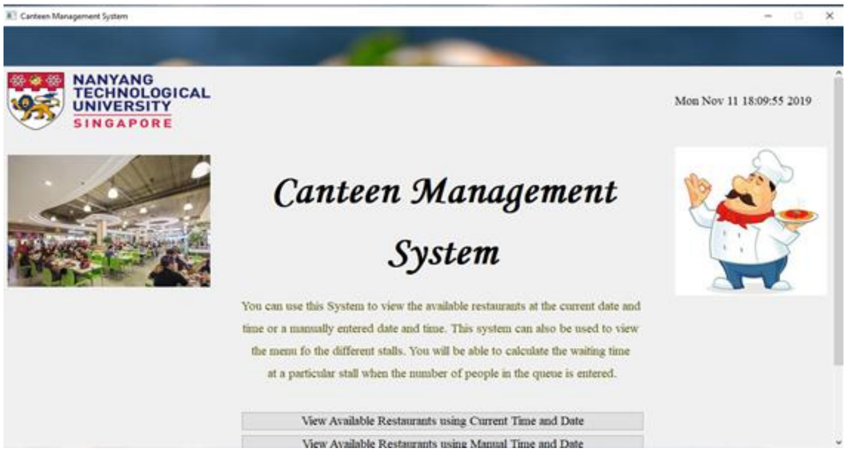
This project aims to develop a program for users to view NTU's North Spine Canteen stalls' information and menus. In addition, users can check the menu of the available stalls according to the current timing or their own input timing, estimated waiting time, and the stalls' operating hours.

Members' Contribution

Kesarimangalam Srinivasan Abhinaya	GUI and Main Menu
Kong Cheng Zhen	Menu and Restaurant availability based on current time and user input time
Lee Lucius	Estimated waiting time, operating hours of stalls and Input validation functions

Program Information

The program uses PyQt, a module that helps build a Graphical User Interface (GUI). PyQt is an easy to use module that provides the necessary functions for the programmer to create an engaging graphical interface. GUI provides a more user - friendly experience while using the program. The interface is clear and straightforward with only the important buttons shown for users to utilize.



Canteen Management System
NANYANG TECHNOLOGICAL UNIVERSITY SINGAPORE
Mon Nov 11 18:09:55 2019
Canteen Management System

You can use this System to view the available restaurants at the current date and time or a manually entered date and time. This system can also be used to view the menu fo the different stalls. You will be able to calculate the waiting time at a particular stall when the number of people in the queue is entered.

View Available Restaurants using Current Time and Date
View Available Restaurants using Manual Time and Date

An image of the main screen of the program

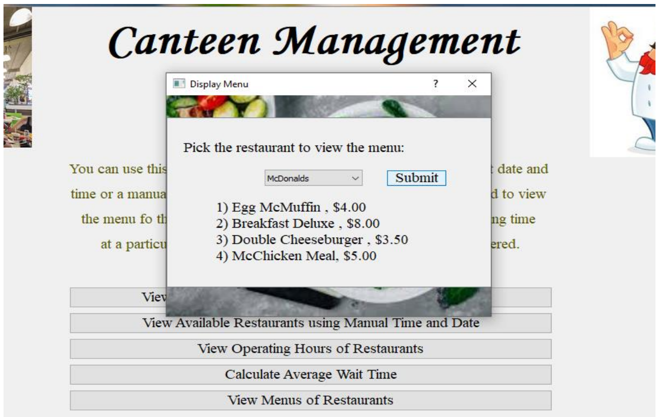
2. PROGRAM FUNCTIONS

A. Stall Information

The stall information (as in the menu of each stall) is stored in different files for the different stalls. They are accessed individually and then displayed. The operating hours of all the stalls are stored in a single separate file.

B. Stall Menus

Users are able to view the menus for all of the stalls with this feature.

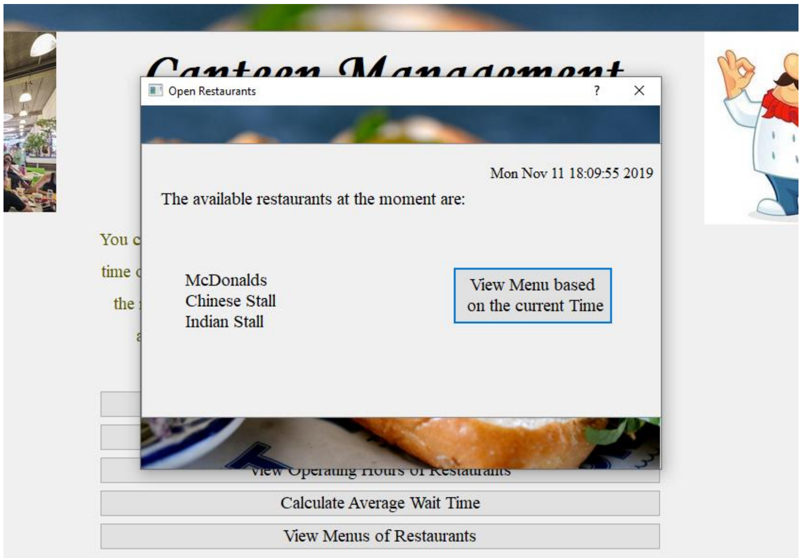

Canteen Management
Display Menu
?
×
McDonalds
Submit
View Available Restaurants using Manual Time and Date
View Operating Hours of Restaurants
Calculate Average Wait Time
View Menus of Restaurants

Pick the restaurant to view the menu:

1) Egg McMuffin , $4.00
2) Breakfast Deluxe , $8.00
3) Double Cheeseburger , $3.50
4) McChicken Meal, $5.00

C. Current System Date and Time

The program will generate the current date and time using the datetime module when the users are utilizing the app. It will proceed to show the food options that are available for each of the stalls that are currently operating.


Canteen Management
Open Restaurants
?
×
View Menu based on the current Time
Calculate Average Wait Time
View Menus of Restaurants

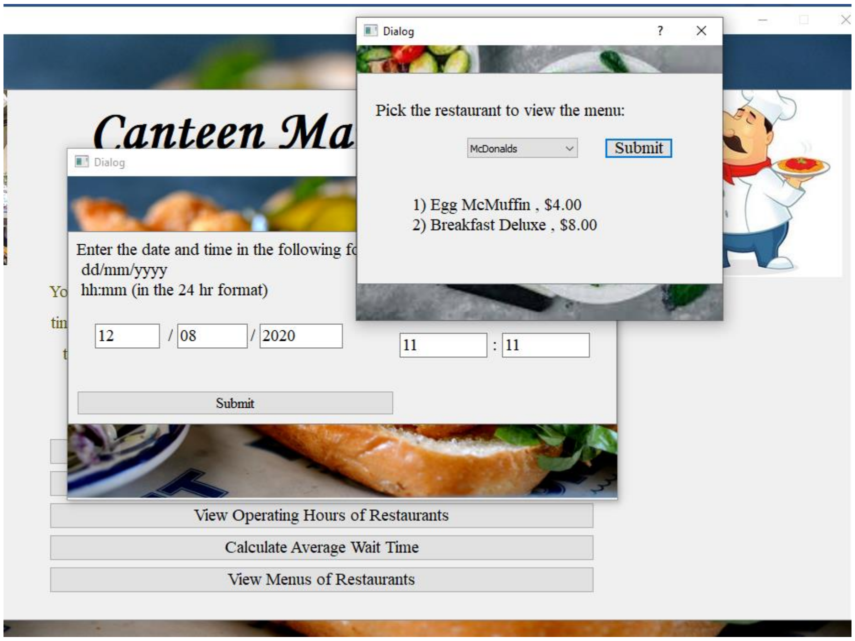
Mon Nov 11 18:09:55 2019

The available restaurants at the moment are:

McDonalds
Chinese Stall
Indian Stall

D. User Defined Date and Time

Users can set a date and time to check the food options available from the stalls. The program will process the date and time chosen and list out the available menus from the selection. The program also obtains the day from the user’s input. This function is useful for users to check if the stalls are selling the food item that they want to consume in the future, or to consider if they want to purchase the food available. To illustrate, if the user chooses a timing in the morning, the program will show the breakfast menu for McDonalds instead of the lunch and dinner menu.



Dialog
Canteen Ma
Dialog
Submit
Submit
View Operating Hours of Restaurants
Calculate Average Wait Time
View Menus of Restaurants

Pick the restaurant to view the menu:

McDonalds

1) Egg McMuffin , $4.00
2) Breakfast Deluxe , $8.00

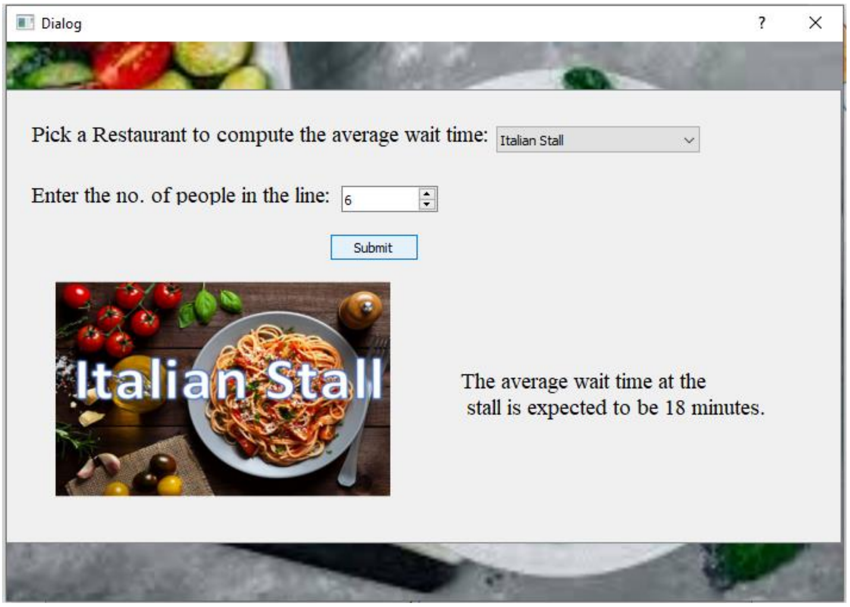
Enter the date and time in the following fo
dd/mm/yyyy
hh:mm (in the 24 hr format)

12 / 08 / 2020

11 : 11

E. Estimated Waiting Time

Users can select the number of people in the queue for a stall and the program will generate an approximate waiting time. Certain stalls like McDonalds have a shorter waiting time of 1 minutes per person, others like the Italian stall has a longer waiting time of 3 minutes per person.



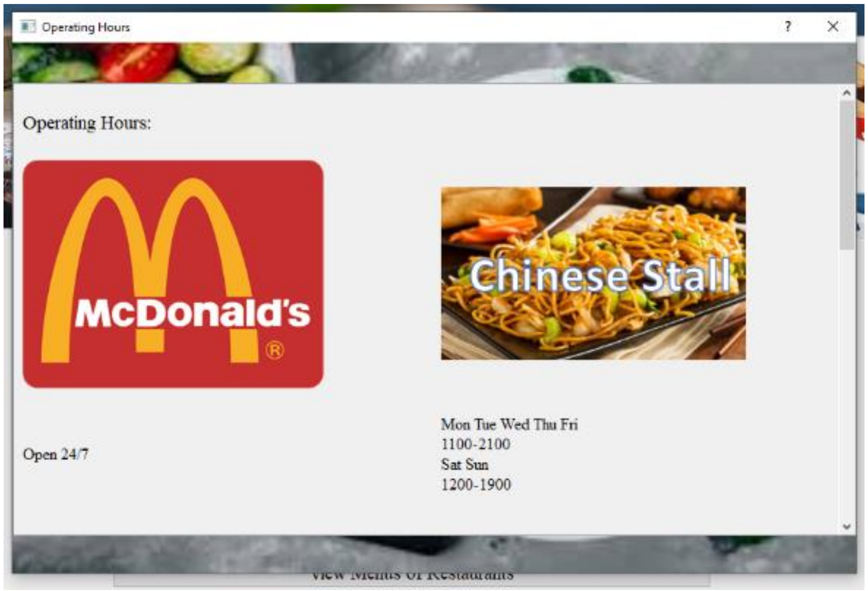
Pick a Restaurant to compute the average wait time: Italian Stall

Enter the no. of people in the line: 6

The average wait time at the
stall is expected to be 18 minutes.

F. Operating Hours

Users can check the program for the operating hours of each stall.

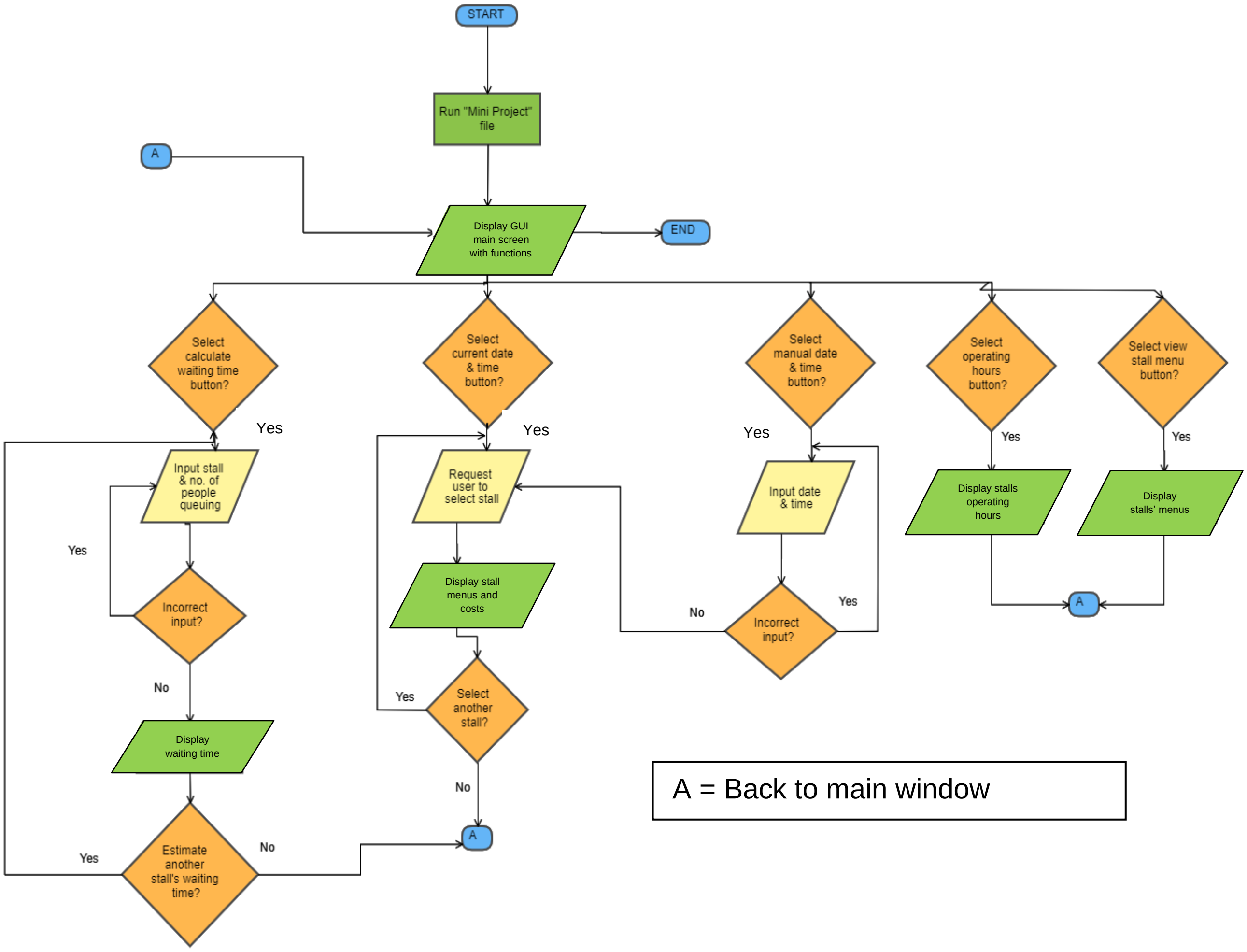


Operating Hours:

Open 24/7

Mon Tue Wed Thu Fri
1100-2100
Sat Sun
1200-1900

3. FLOWCHART OF PROGRAM

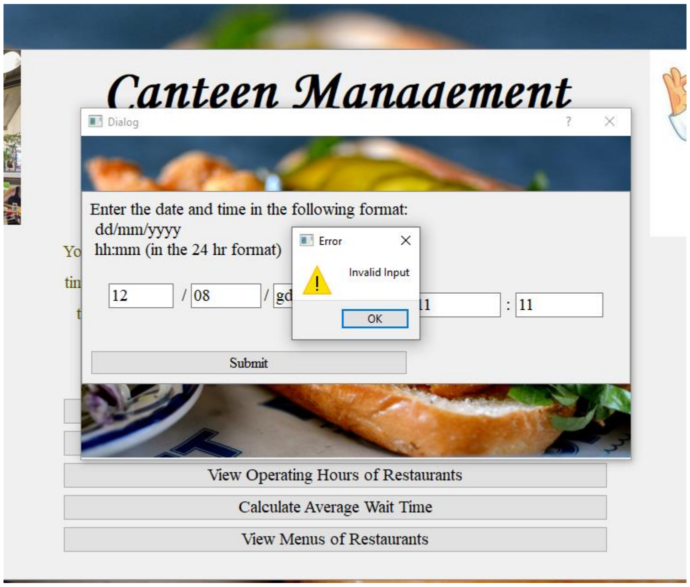

START
Run "Mini Project" file
A
Display GUI main screen with functions
END
Select calculate waiting time button?
Select current date & time button?
Select manual date & time button?
Select operating hours button?
Select view stall menu button?
Yes
Yes
Yes
Yes
Yes
Input stall & no. of people queuing
Request user to select stall
Input date & time
Display stalls operating hours
Display stalls' menus
Yes
Incorrect input?
Display stall menus and costs
No
Yes
Incorrect input?
A
No
Yes
Select another stall?
Display waiting time
No
A
Yes
Estimate another stall's waiting time?
No
A = Back to main window

4. PROGRAM TESTING

After developing our program, we tested each of the functions out. While there were no issues with the stalls' information and menus feature, the rest of the features had to be improved such that the users will not face any problems when using the program.

Problems Encountered

Functions that require an input from the user:
Initially, our functions for user to input their date, time, and number of people in the queue requires them to key in their own values. As such, users can type in non-numerical symbols such as alphabetical letters, special symbols (eg. !, @, #), or leave a white space. These are not possible values for the date, timing, and number of people in the queue. Errors would arise from these scenarios which would affect the functionality of our program.


Canteen Management
Dialog
Error
OK
Submit
View Operating Hours of Restaurants
Calculate Average Wait Time
View Menus of Restaurants

Enter the date and time in the following format:
dd/mm/yyyy
hh:mm (in the 24 hr format)

12 / 08 / gd 11 : 11

Invalid Input

An example of an invalid input: letters are keyed in

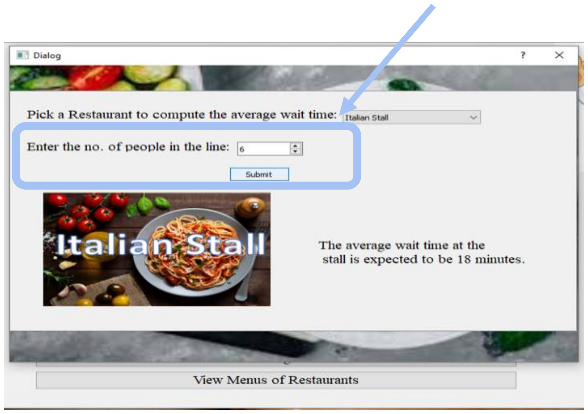
Solution

Exception Handling:
Inputs keyed in as letters, special symbols, or white space will be deemed as invalid. The user will be required to key in the proper values.

For user input date:

Invalid Characters Used:	**Example of Input (dd/mm/yyyy):**	**Error Shown:**
Letters	12/08/abcd	Invalid Input
Special Symbols	12/08/20!@	Invalid Input
White Space	12/ /2019	Invalid Input
Extra Digits (not in dd/mm/yyyy format)	Day: 123/08/2019, Month: 12/089/2019, Year:12/08/20199,	Invalid Input
Values that are out of range	Day: 32/08/2019 Month: 12/13/2019 Year: 12/08/3019	Invalid Input

For the number of people in the queue:
There is an increase and decrease button for users to click to the desired number of people queuing. It does not allow the user to key in alphabets or negative values



Pick a Restaurant to compute the average wait time: Italian Stall

Enter the no. of people in the line: 6

The average wait time at the stall is expected to be 18 minutes.

5. REFLECTIONS

Kesarimangalam Srinivasan Abhinaya:

Through the development of this project, I learnt a lot about creating a GUI Interface using Python. Being a new field, I had to do a lot of research to understand how each feature works in a GUI. I first tried creating the GUI using tkinter but found it hard to incorporate the multitudinous features that were demanded by the project. Hence, I decided to shift to PyQt as I was able to understand it better. Slowly as time progressed and I started developing the various features, I was able to understand how a GUI works and what goes in to create a user- friendly interface.

Working with Cheng Zhen and Lucius has helped me understand the importance of teamwork and coordination. We were able to split the work well and hence were able to put together this project without confusions and misunderstandings. This Mini Project has been a great learning experience for me and I am thankful that we were given this opportunity to learn.

Kong Cheng Zhen:

Having no prior experiences to programming aside from the lab activities, this project was not easy for me. I spent a lot of time researching online about the different ways to implement a single function for the program. I learnt that there can be many ways to write a code and that each method can be more useful than others. For example, there were many different codes to use when creating a function for the date and time inputs, such as using the datetime() class of the datetime module, or using the strftime method to format them into more readable strings.

More importantly, I learnt many values from this project, such as time-management, team-work and helping one another out. I feel that this project is a great opportunity for students to learn and practice coding and apply it to the real-world context such that it can benefit others. It can really promote self-directed learning as we are tasked to create our own program, so it is necessary to research for information on our own.

Lee Lucius:

By working on this project, I learnt that communication is key. If teammates do not clearly set what each individual is in charge of, and what part of the rubric they must meet, the program can go haywire very quickly. While my team had some trouble assigning workload in the beginning, we were able to recover to smoothly continue the project.

Another critical point I have learnt after finishing the program is that a clear and coherent algorithm is needed for the program. The algorithm effectively allows the team to understand how the program works and which part of the program they are managing. Luckily, my team was able to create a concise flowchart of our program that show how the proceeds. I would find myself referring to this flowchart many times during the coding phase, helping me understand the overall process of the program and where my part fits into it. This shows how crucial an algorithm is before even starting to code the program.

This project helped me learn about working with teammates and others while also brushing up my coding and programming skills, thus gaining more knowledge of the subject in the process.

6. REFERENCES

https://stackoverflow.com/questions/41290035/pyqt-change-gui-layout-after-button-is-clicked/41290921

https://stackoverflow.com/questions/9847213/how-do-i-get-the-day-of-week-given-a-date

https://www.youtube.com/watch?v=Vde5SH8e1OQ