American International University-Bangladesh (AIUB)

Department of Computer Science
Faculty of Science &Technology (FST)
Summer 21 22

Section: C
Software Quality Assurance and Testing

Restaurant Management System

A Report submitted
By

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Assistant Professor

Software Test Plan

for

Restaurant Management System

Version 0.7 approved

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American International University-Bangladesh

13-08-2022

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Revision History

Revision	Date	Updated by	Update Comments
0.1	2022.08.13	Md. Sadman Rahman	First Draft
0.2	2022.08.16	Niaz Rahman Bhuiyan	Second Draft
0.3	2022.08.19	Sakib Al Habib	Third Draft
0.4	2022.08.19	Shafayet Hossain	Fourth Draft
0.5	2022.08.20	Md. Sadman Rahman	Fifth Draft
0.6	2022.08.21	Niaz Rahman Bhuiyan	Sixth Draft
0.7	2022.08.21	Md. Sadman Rahman	Final Draft

1. TEST PLAN IDENTIFIER:RS-MTP01.3

2. REFERENCES

o Sharma, A., Vardhan, M., & Kushwaha, D. S. (2014). A versatile approach for the estimation of software development effort based on SRS document. *International Journal of Software Engineering and Knowledge Engineering*, *24*(01), 1-42.

o Anon, 2022. IDE and code editor for software developers and teams. *Visual Studio with Unit Tester*. Available at: https://visualstudio.microsoft.com/ [Accessed August 21, 2022].

o Anon, The Rapid Prototyping Tool. *Pidoco*. Available at: https://pidoco.com/en [Accessed August 21, 2022].

3. INTRODUCTION

Background to the Problem

Nowadays restaurant business has started to grow in a significantly faster rate. To manage the entire system of a restaurant, a sophisticate management software is required to maintain a smooth operation. Because without any management system, it involves a lot of manual labor. The traditional ordering system is inconvenient for both staff and customers. The manual work performed by the employees will result in certain human errors, such as giving the wrong bill to the clients, the waiter having bad handwriting, and the wrong order of the orders. All of these human mistakes will make customers angry with the establishment.

Most of the software which are built for these restaurants are expensive to develop and maintain. This causes most of the restaurant to continue with manual system. As a result, startup restaurants and most of the smaller restaurants doesn't have any restaurant management system.

Solution to the Problem

To solve this problem, we are proposing a solution where a system will be developed for the staff side. Till now staff had been operatizing manually from taking order to making payment and also updating or modifying any information. Thus, through the execution of our new tentative system it will make the work much easier and efficient. Staffs will not have to do their operations manually which will ultimately save time and return of investments will rise as well. Making the overall application effective will eventually increase revenue for our organization. Studies have been performed throughout years to improve the automated system for

operations in restaurant. Many achievements have been made through this journey. Some of the solutions that are already in the market are mentioned below:

- POS system
- Sapaad
- Clover Revel System POS
- 7shifts
- CAKE

4. REQUIREMENT SPECIFICATION

4.1 System Features

1. *Manager/Employee Login*
Functional Requirements
1.1 Users must be able to log in to the software using their assigned userID and password.
1.2 There is no option for registration. The manager can add new employees with their assigned userID and password. Then the employee can login using their given userID and password.

Priority Level: High
Precondition: Manager/Employee should have valid userID and password

2. *Change Manager*
Functional Requirements
3.1 When a new manager takes the office, the old manager can update the information of the new manager replacing his information.
3.2 While updating the new manager's information, the current manager has to put the new manager's name and id.

Priority Level: High
Precondition: This function can only be accessed through the manager's account.

3. *Add New Employee*
Functional Requirements
3.1 Managers can add new employee to the system with all the necessary information.

Priority Level: Medium
Precondition: This function can only be accessed through the manager's account.

4. *Update Employee Salary*
Functional Requirements
4.1 Managers can add new employee to the system with all the necessary information.

Priority Level: Medium
Precondition: This function can only be accessed through the manager's account and the employee must exist.

5. Remove Employee
Functional Requirements
5.1 Managers can remove any existing employee.

Priority Level: Medium
Precondition: This function can only be accessed through the manager's account and the employee must exist.

6. Add Order
Functional Requirements
6.1 Employee can add orders with specific food items.

Priority Level: Medium
Precondition: This function can only be accessed through the employee's account.

7. Update Phone/Password
Functional Requirements
7.1 Employee can update phone no.
7.2 They can change their password by confirming their identity.

Priority Level: Medium
Precondition: This function can only be accessed by an employee.

4.2 System Quality Attributes

Numerous criteria can be used to define quality. Every person has a distinct idea of what quality is. Finally, some ground rules ought to be established. A product is considered to be of good quality if it is easy to use and has all the necessary features. While Quality Assurance Activities or Attributes are concerned with preventing the introduction of errors, Quality Control Activities seek to identify problems in goods and services. According to the statement, the following can be used to guarantee the highest quality for all products produced by the company.

Correctness: *The digits which will be calculated for the payment and orders should not be inaccurate.*
Reliability: The system which will be implemented should not be turned off at any time so that it will always provide service.
Robustness: If manager or employee's operation gets hampered by shutdown of the system it should quickly recover to its normal operation.

Security: Making the system enough secure so that it should not be breached by any heinous personnel which will eventually compromise financial or employee data.
Availability: The system should support at peak hours so that operation of employee and manager does not get hampered.
Maintainability: The system should be implemented in such a way that if any modifications, improvement of performance or other attributes required then that could be applied easily.
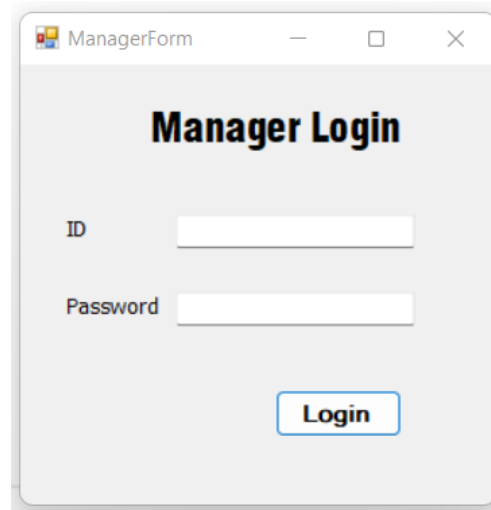
4.3 System Interface

System interface where the users will interact with the system's functionality are given below with description.

1. **Home Page**: This is the Homepage of our website which welcomes our users to our software.
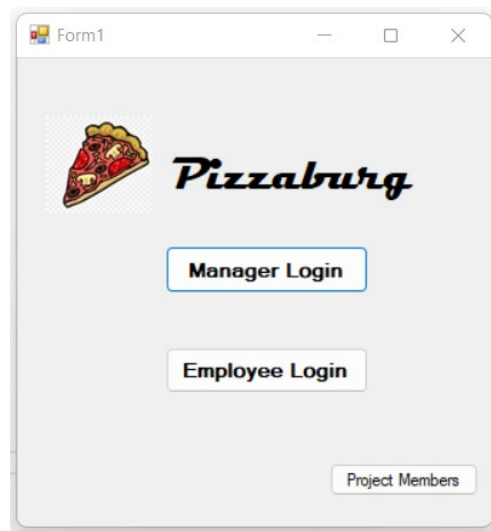
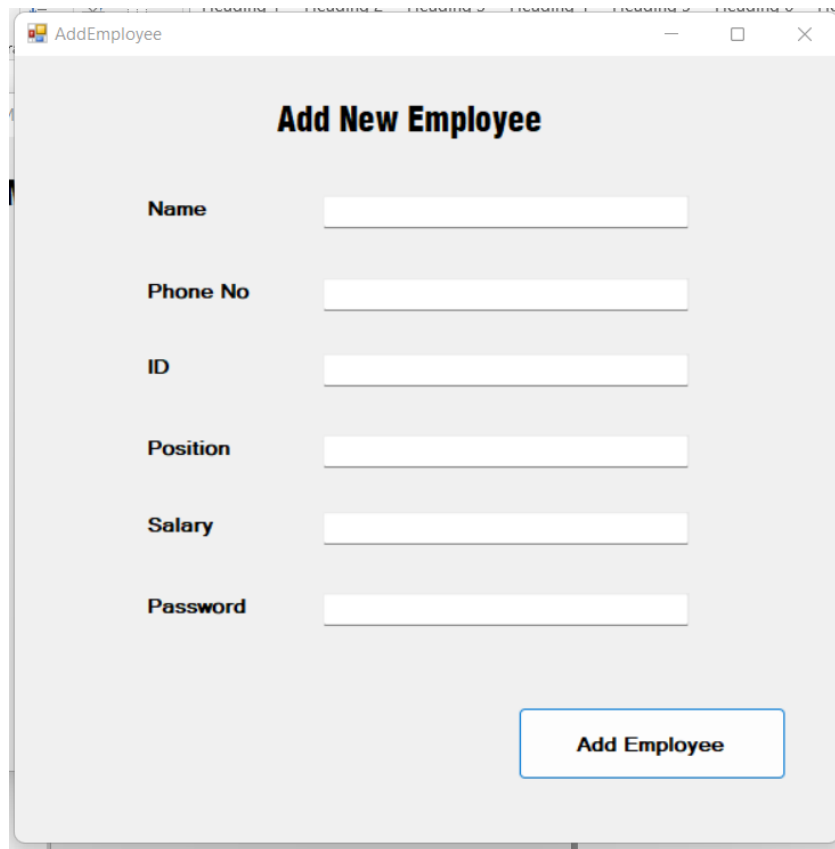2. **Manager Login**: From here the manager can login.

3. **Manager Dashboard**: This is the dashboard of the manager. From here manager can add new employee, change salary, remove employee, search employee as well as change manager.
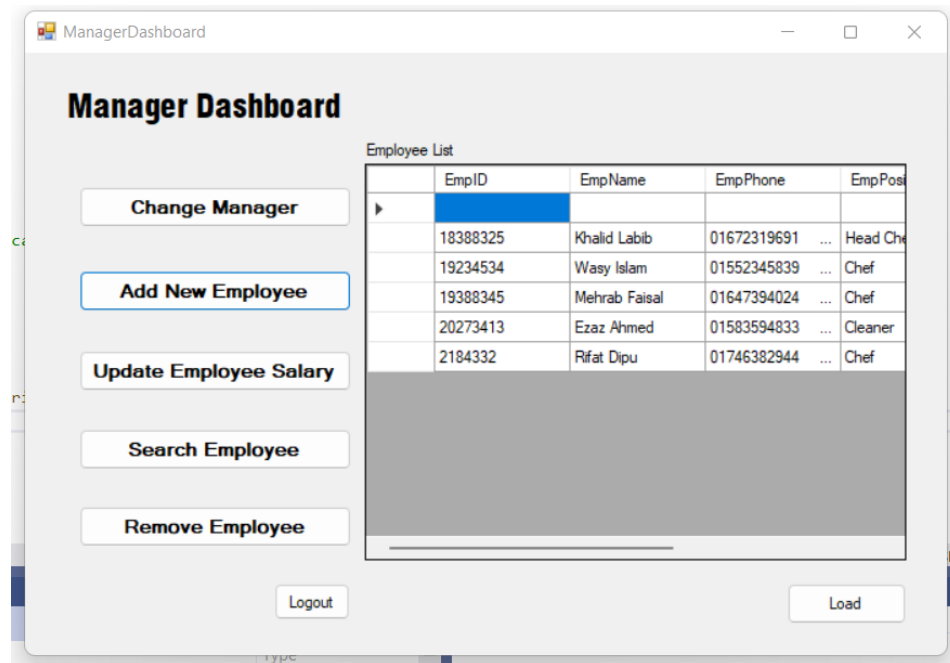
4. **Change Manager**: From here the current manager can transfer his role to a new manager. The new manager has to put his information here.
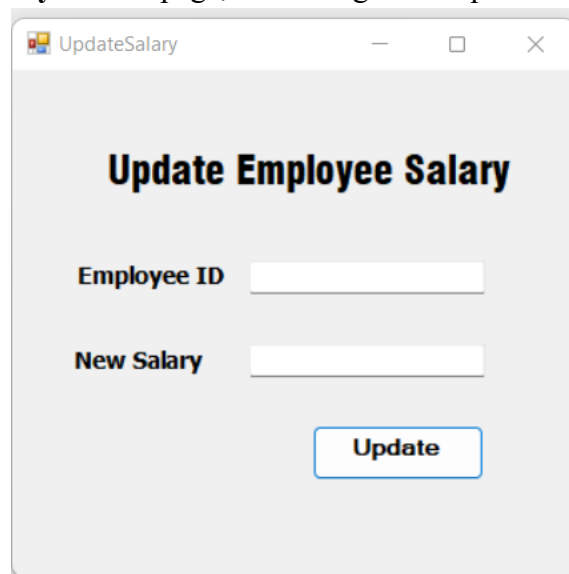

5. **Add New Employee**: The manager can add new employee by providing information of that employee.
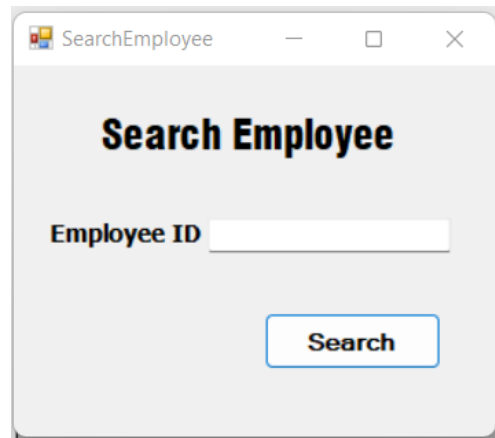
6. **Update Employee Salary**: In this page, the manager can update any employee's salary.
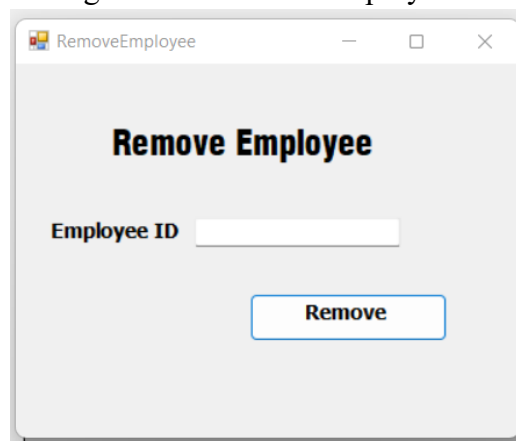
7. **Search Employee**: The manager can enter an id to search if there is any employee holding that id.
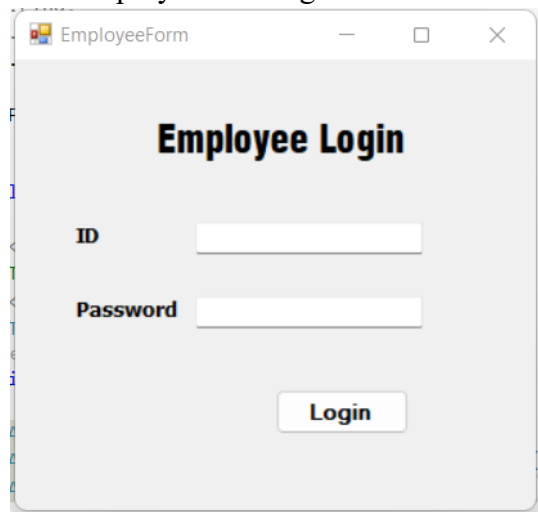
8. **Remove Employee**: The manager can remove an employee if required from here.
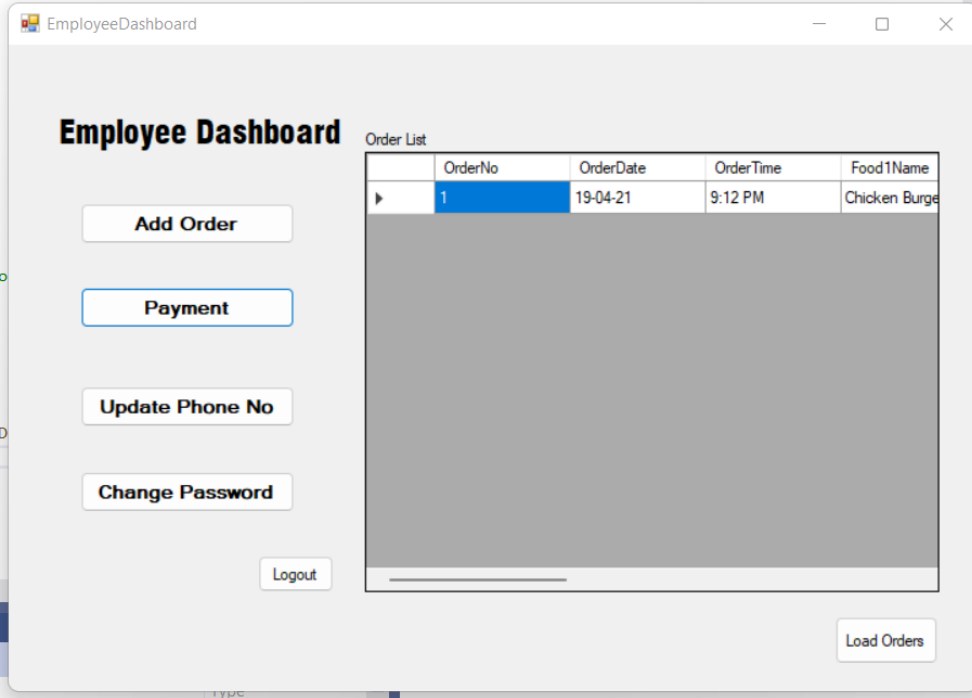
9. **Employee Login**: From here employees can login to their dashboard.

10. **Employee Dashboard**: From the employee dashboard, the employees can: Add an order, Change payment status, Update phone no and change password.
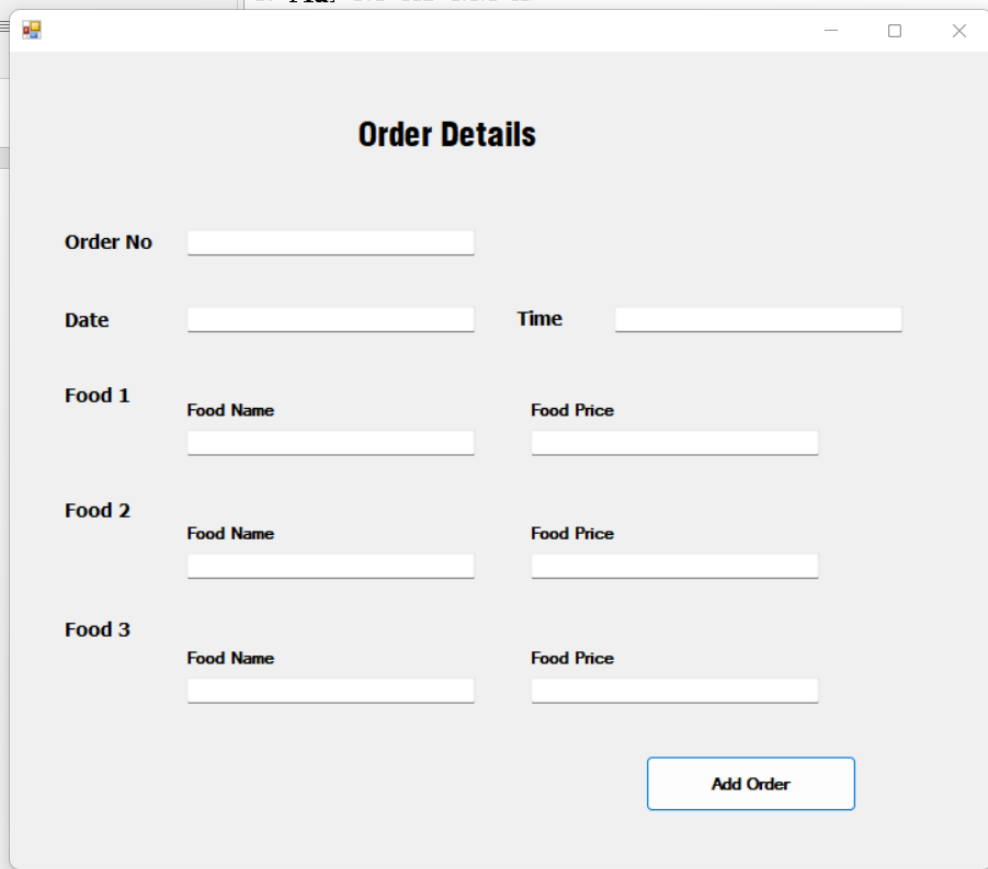
11. **Add Order**: After receiving an order, employees can add the order to the system through this.
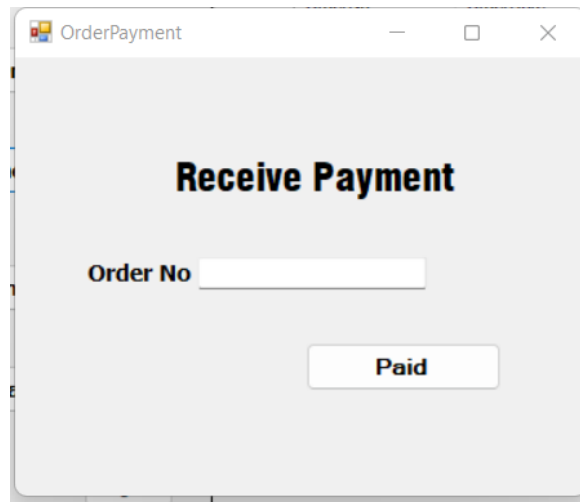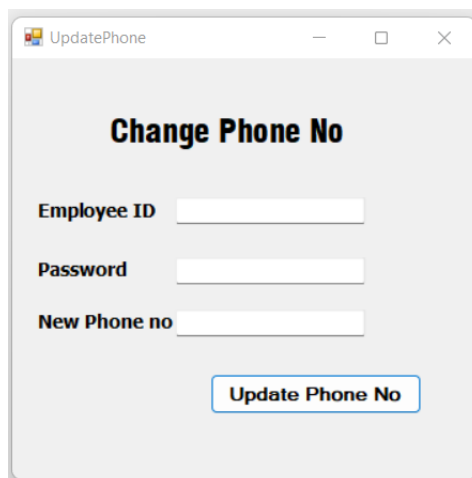
12. **Payment**: After receiving the payment, the employee can update the status of the order to paid.
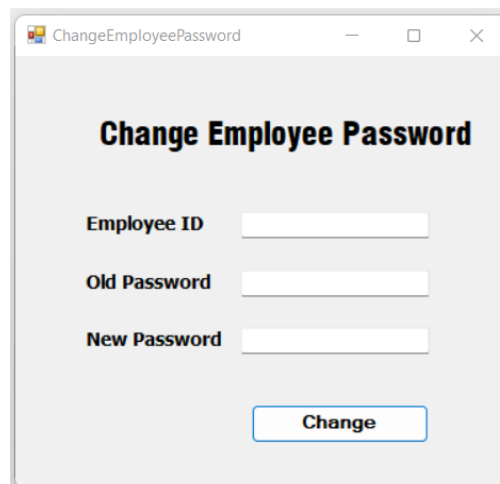
13. **Update Phone No**: If the employee wants to change their phone no, they can update it from here.

14. **Change Password**: If the employee needs to change their account's password, they can change it from here.

4.4 Project Requirements

Developer Team:

Team Member	Total Number	Hour/Day	Monthly Salary (Per Person)	Total Salary
Business Analyst	1	6	40,000/-	60,000
Senior Developer	2	6	50,000/-	100,000
UX Designer	2	4	40,000/-	80,000
Front-end Developer	2	3	45,000/-	90,000
Back-end Developer	2	3	45,000/-	90,000
Quality Tester	2	5	45,000/-	90,000

Table 1: - Developer Cost Table

Estimated Monthly Salary for Developers:

$$60,000 + 100,000 + 80,000 + 90,000 + 90,000 + 90,000 = 510000/-$$

So, the total salary cost for one month of development is 510000 BDT

The time it will take to finish development is estimated to be around 7 weeks or 1.7 months

Estimated Total Salary During Project Development: 510000 X 1.7 = 867000 BDT

Annual Office Rent and other Cost:

- *Office Space Rent:*
  Approximately 70,000 BDT Per Month [In Gulshan Area]
  Total Office Rent (During project development):
  $$= 70,000 \ X \ 2 = 140000/-$$

- *Electricity Bills:*
  Average electricity bill for a typical office space is around 20,000 BDT
  So, Total electricity bill (During project development)
  $$= 20,000 \ X \ 2 = 40,000 \ BDT$$

- *Others:*
  Internet Cost (During project development): 1000 X 2 = 2000/-Approx. office accessories cost 3,000/-

Grand Total:

867000 + 140000+ 40,000 + 2000 +3000 = 1,052,000 BDT

5. FEATURES NOT TO BE TESTED

The following is a list of the areas that will not be specifically addressed. All testing in these areas will be indirect as a result of other testing efforts. For example:

o System being available all time during a day.
o ID and password of employee or manager should not be disclosed to the tester.
o Limiting number of chairs and tables available so that a queue does not get created for accommodation.

6. TESTING APPROACH

6.1 Testing Levels

Here we plan and execute the testing plans which we have been planning to execute. Four level of tests will be conducted here. They are:
1. Domain Testing
2. Unit Testing
3. System/Integration Testing
4. Acceptance Testing

These will be performed keeping in mind the deadline, budget and prioritization of functional and non-functional requirements.

o **DOMAIN Testing**: Testing will be done by the tester where each of the input will carefully be given and their corresponding output will be observed carefully. Later on, it will be approved or disapproved by the testing team lead on the basis of testing result.

o **UNIT Testing**: Unit testing here will be carried by the developer to end, this test will be executed by the programmer himself. He will be looking over each test case, overview the output, fix any bug if detected. Test cases will be provided by test leader to the assigned tester. Unit testing has the benefit of detecting and preventing bugs early which will eventually benefit us as it will not cost our software firm to invest more, increasing budget. It will also help to keep up with the deadline.

o **SYSTEM/INTEGRATION Testing**: It is done after unit testing performed. It will be carried by the test manager, development team with assistance of each individual developer members. Testing tools might not be used here. While integrating the entire system if any bug gets detected it will be corrected accordingly. Most of the bugs and errors might arise here as each module is being connected and integrated here.

o **ACCEPTANCE Testing**: It will not be performed by general end users rather than the owner and staff members of the restaurant team. Additionally, this test will be performed by test manager and development team leader simultaneously after completion of System/Integration testing.

6.2 Test Tools

The testing tools that we have used to test our software is Microsoft Visual Studio Unit Tester (.NET Framework). The project that we have worked on is based on C# programming language. Here are some screenshots of the testing process that we have performed:
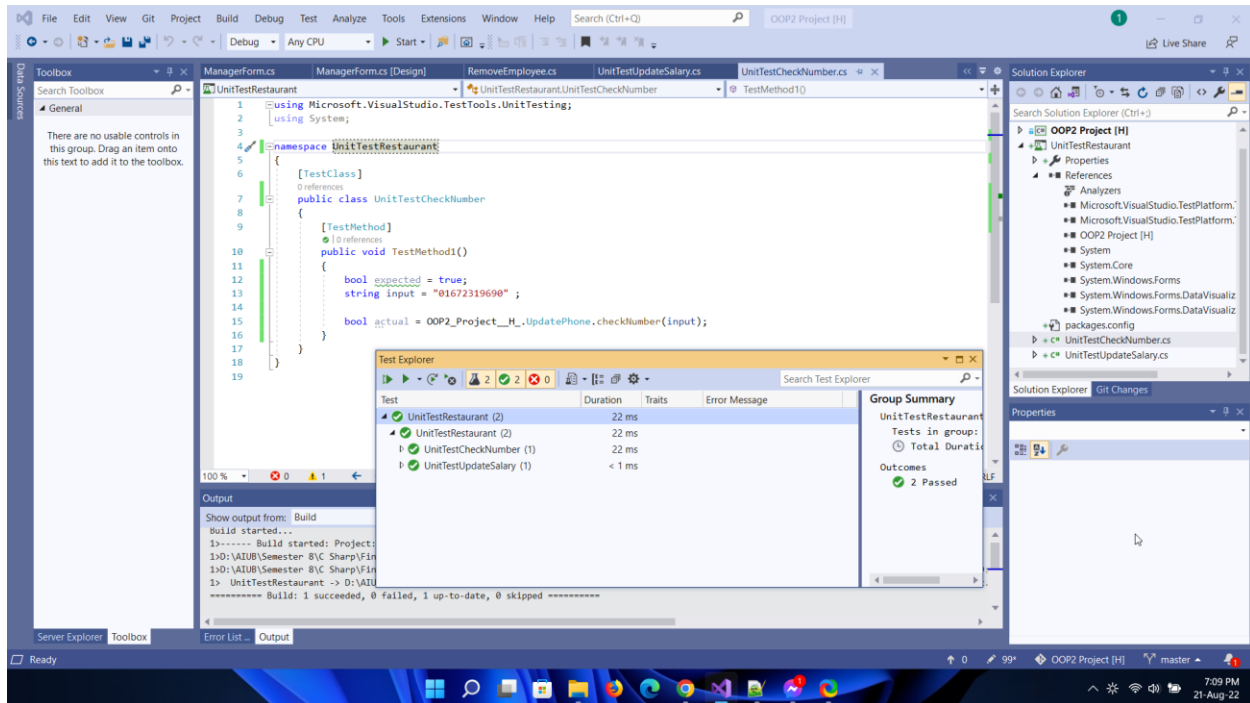
Fig: Testing of Updating Employee Phone no
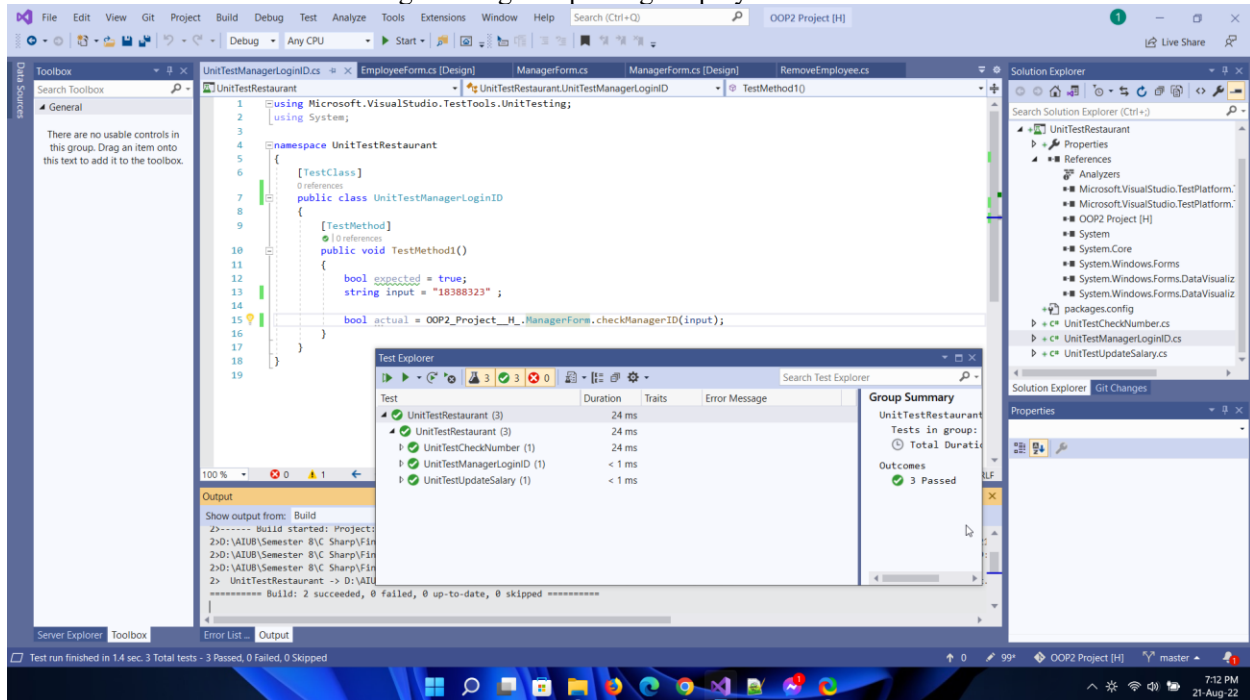
Fig: Testing of Manager Login Form
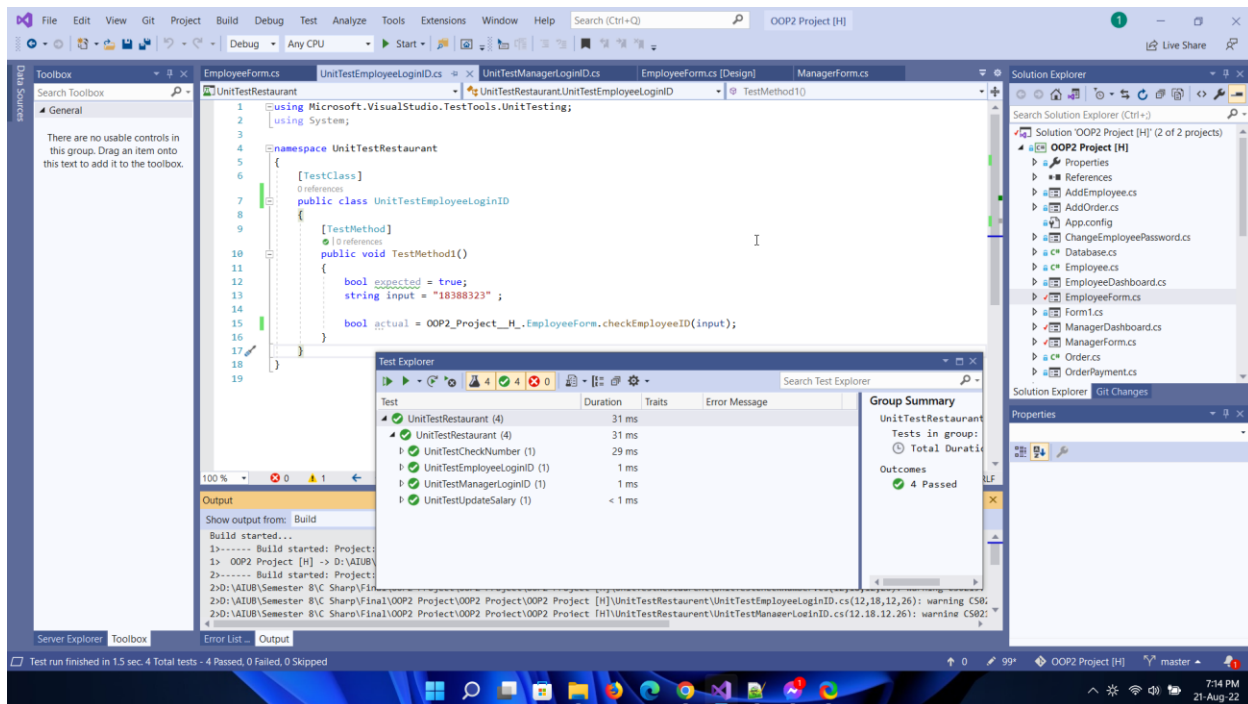
Fig: Testing of Employee Login form

We have also performed manual testing on this project. Because automated testing is good but it can not replace manual testing for various reasons. After performing manual testing we have noticed some errors associated with the Food Ordering section.
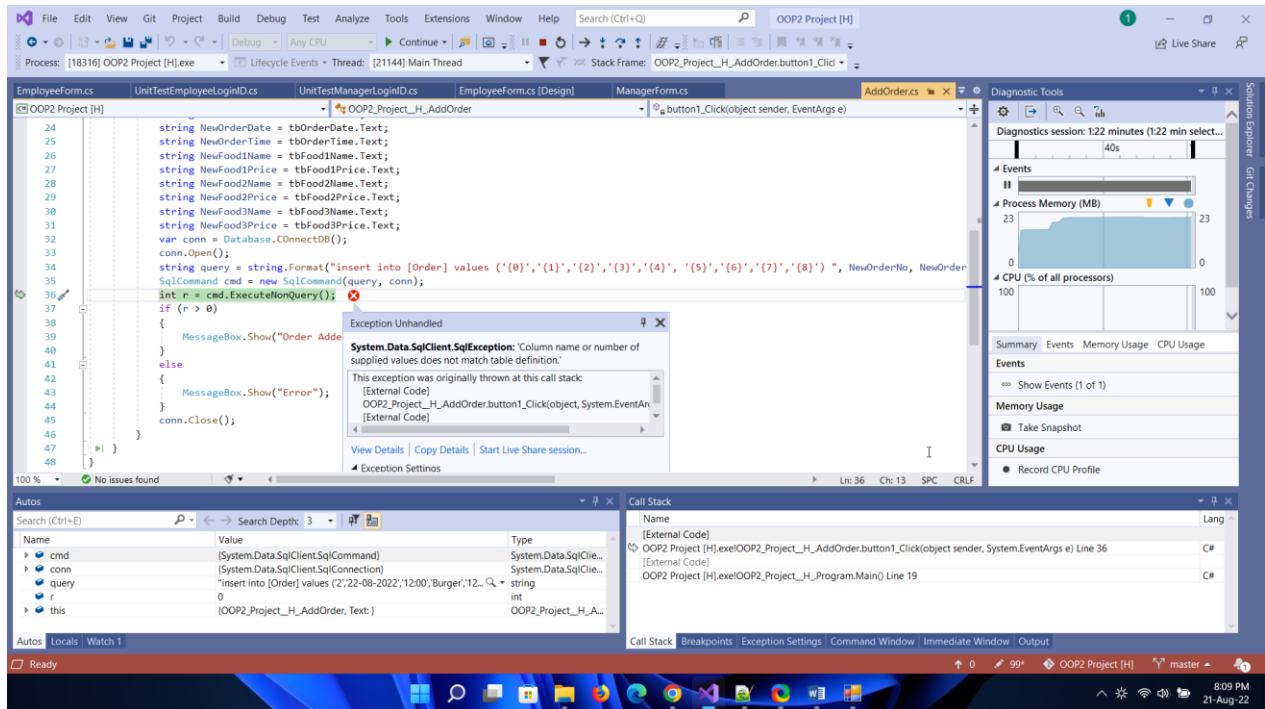
Fig: Manual Testing of ordering multiple food items

When an employee wants to place an order with multiple food items, the order never places and some errors are occurred.

6.3 Meetings

The meeting will be held each week to assess progress and identify trends and issues with errors as soon as possible. The project manager and the head of the testing team will also meet every two weeks. These two sessions will take place in separate weeks. Extra meetings may be called in an emergency.

Additional meetings should be conducted with the respective stakeholders of the system, specially who are investing on the system. If suppose the system we will make would be maintained and configured in house then we will have to sit down with their IT team and make them understand the overall system.

7.   TEST CASES/TEST ITEMS

`

Test Case ID: FR_1			Test Designed date: 14.08.22	
Test Priority (Low, Medium, High): High			Test Executed by: Sadman	
Module Name: Login Employee			Test Execution date:14.08.22	
Test Title: verify login with valid user id and password				
Description: Test application login page				
Precondition (If any): Employee must have valid user id and password				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Enter username 3. Enter password 4. Click login	Username: 99999999999 Password: 321	Employee should login into the application	As expected,	Pass
Post Condition: Employee is validated with database and successfully login to account. The account session details are logged in the database.				

Test Case ID: FR_2				Test Designed date: 14.08.22	
Test Priority (Low, Medium, High): High				Test Executed by: Niaz	
Module Name: Login Manager				Test Execution date: 14.08.22	
Test Title: verify login with valid user id and password					
Description: Test application login page					
Precondition (If any): Manager must have valid user id and password					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
5. Go to the application 6. Enter user id 7. Enter password 8. Click login	User id: 18387703 Password: 1234	Manager should login into the application	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

Test Case ID: FR_3				Test Designed date: 14.08.22	
Test Priority (Low, Medium, High): High				Test Executed by: Shafayet	
Module Name: Change Manager				Test Execution date: 14.08.22	
Test Title: Update new Managers Information					
Description: Testing the update of manager profile information					
Precondition (If any): Manager must be logged in from their account while updating information					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to manager dashboard 2. Click on change Manager 3. Enter new managers name 4. Enter new managers user id 5. Enter new managers password	Manager Name: Shafayet User id: 18387703 Password: 1234	Manager should update information	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

Test Case ID: FR_4			Test Designed date: 14.08.22		
Test Priority (Low, Medium, High): High			Test Executed by: Niaz		
Module Name: Add New Employee			Test Execution date: 14.08.22		
Test Title: Inserting new employee					
Description: Testing the update of manager profile information					
Precondition (If any): Manager must be logged in from their account while inserting new employee					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Add New Employee 2. Insert Name, Phone Number, ID, Position, Salary, Password 3. Then click Add Employee	Name: Shafayet Phone Number: 0192594723 ID: 18387703 Position: Chef Salary: 43,000 Password: 1234	Manager should insert new employee information	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

Test Case ID: FR_5			Test Designed date: 14.08.22		
Test Priority (Low, Medium, High): Medium			Test Executed by: Sadman		
Module Name: Update Employee Salary			Test Execution date: 14.08.22		
Test Title: Salary updating of employee					
Description: Test update of salary information					
Precondition (If any): Manager must be logged in from their account while updating salary information					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Update Employee Salary 2. Enter employee id and new salary 3. Then click update	Employee ID: 18387703 New Salary: 24,000	Manager should update salary information	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

Test Case ID: FR_6			Test Designed date: 14.08.22		
Test Priority (Low, Medium, High): Low			Test Executed by: Niaz		
Module Name: Search Employee			Test Execution date: 14.08.22		
Test Title: Searching an employee					
Description: Test searching of an employee					
Precondition (If any): Manager must be logged in from their account while searching an employee					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Search Employee 2. Enter employee id 3. Click Search	Employee ID: 18387703	Manager should be able to find desire employee	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

Test Case ID: FR_7			Test Designed date: 14.08.22		
Test Priority (Low, Medium, High): Medium			Test Executed by: Sadman		
Module Name: Remove Employee			Test Execution date: 14.08.22		
Test Title: Removing employee					
Description: Test removal of an employee					
Precondition (If any): Manager must be logged in from their account while removal of employee					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to Remove Employee 2. Enter employee id 3. Click Remove	Employee ID: 18387703	Manager should be able to remove an employee	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

Test Case ID: FR_8			Test Designed date: 14.08.22	
Test Priority (Low, Medium, High): Medium			Test Executed by: Sadman	
Module Name: Add Order			Test Execution date: 14.08.22	
Test Title: Adding Order for the customer				
Description: Test adding order				
Precondition (If any): Employee must be logged in from their account while adding order				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Order Details 2. Enter order date, time, three food and their equivalent price 3. Click Add Order	Order No: 23 Date: 02.08.22 Time: 10:42 AM Food Name: Burger Food Price: 300	Employee should be able to place order successfully	Not being able to place order while ordering multiple food items.	Fail
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.				

Test Case ID: FR_9			Test Designed date: 14.08.22	
Test Priority (Low, Medium, High): Medium			Test Executed by: Sadman	
Module Name: Payment			Test Execution date: 14.08.22	
Test Title: Making Payment				
Description: Testing Payment				
Precondition (If any): Employee must be logged in from their account while receiving payment				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Receive Payment 2. Enter Order Number 3. Click Paid	Order No: 23 Date: 02.08.22 Time: 10:42 AM Food Name: Burger Food Price: 300	Employee should be able to place order successfully	Not being able to place order while ordering multiple food items.	Fail
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.				

Test Case ID: FR_10			Test Designed date: 16.08.22	
Test Priority (Low, Medium, High): Low			Test Executed by: Sakib Al Habib	
Module Name: Update of Phone Number			Test Execution date: 16.08.22	
Test Title: Changing Phone Number				
Description: Testing Modification of Phone Number				
Precondition (If any): Employee must be logged in from their account while receiving payment				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to Change Phone Number 2. Enter Employee ID 3. Enter Password 4. Input new phone number	Employee ID: 18387703 Enter Password: 1234 New Phone Number: +8801685783982	Employee should be able to change phone number successfully	As expected,	Pass
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.				

Test Case ID: FR_11			Test Designed date: 16.08.22		
Test Priority (Low, Medium, High): High			Test Executed by: Sakib Al Habib		
Module Name: Update Password			Test Execution date: 16.08.22		
Test Title: Change Password					
Description: Testing update of password					
Precondition (If any): Employee must be logged in from their account while receiving payment					
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)	
1. Go to change password 2. Enter Employee ID 3. Enter old password 4. Provide new password	Employee ID: 18387703 Enter Old Password: 1234 Enter new password: 1457	Employee should be able to update password successfully	As expected,	Pass	
Post Condition: Manager is validated with database and successfully login to account. The account session details are logged in the database.					

8. ITEM PASS/FAIL CRITERIA

The testing process will be completed when the employee and manager can successfully perform tasks such as logging into their respective accounts and modifying information without encountering any errors. To ensure the system's successful operation, all functional requirements must be thoroughly tested. However, one of our functional requirements could not be met because a customer could not order multiple items at the same time. Some of the minor errors could have been overlooked.

9. TEST DELIVERABLES

- o **Acceptance test plan**
  In this part of our test deliverables we plan to execute it along with our clients who want us to make this system work. We will deliver them a beta version of the project and tell them to give us feedback and its usability.
- o **System/Integration test plan**
  Integration testing plan would be conducted with both the development and testing team. In this part of the test majority of bugs could get detected.
- o **Unit test plans/turnover documentation**
  In this part each individual module would be tested separately and if bug gets detected that could get corrected at earlier stage of development. Programmer who would be writing code of that module would do this testing.
- o **Screen prototypes**
  With the help of UML diagram, we would implement this part where with the help of visual representation and different graphical diagrams as well.
- o **Report mock-ups**
  Draft of the web version would be accomplished with mockups. We will use an online mockup tool from a site name pidoco.com. It is an Open Source Software; with its helps our work will become easier.
- o **Defect/Incident reports and summaries**
  This report would be made with each bugs or defects detected and would be addressed summarized on a single report.
- o **Test logs and turnover reports**
  Lastly here at test logs, information's such as how test was conducted on which time and date with additional information's will be recorded serially. On turnover reports from a selected time period it would be created of how testing makes system with less bug and more profit for the organization.
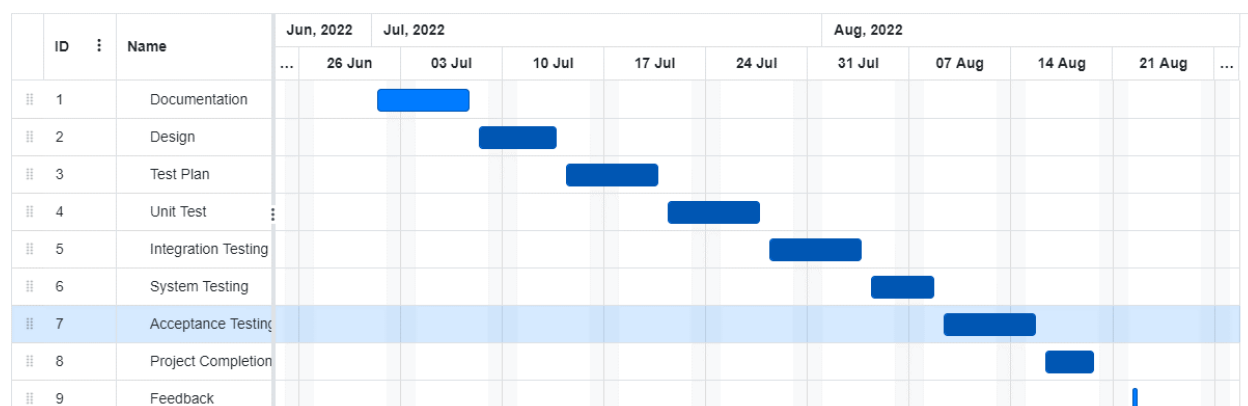
10.   STAFFING AND TRAINING NEEDS

o   To test software effectively, the testing team must have a deep understanding of its requirements. To make sure that the software maintains the quality requirements, it is necessary to employ a quality assurance engineer. The development team's system must comply with the specified functional and non-functional criteria, according to the test team.

o   The restaurant management system should be relatively simple to train the staff and manager in. The design of the data entry form is similar to other forms used by the other user personnel. Data input work has been kept to a minimal and forms are very user-friendly. It will be adequate to train for three to four trials.

11.   RESPONSIBILITIES

	TM	PM	Dev Team	Test Team	Client
Execution and documentation of the acceptance test	X	X		X	X
System/Integration test Exec. & Documentation	X		X	X	
Execution & Documentation of Unit Tests	X		X	X	
Reviews of system designs	X	X	X	X	X
evaluations of specific designs	X	X	X	X	
Rules and procedures for tests	X	X	X	X	
reviews of the prototype's display and report			X	X	X
Testing Regression and Control Test	X	X	X	X	X

12.   TESTING SCHEDULE

The project schedule includes time for the planned testing activities. The project plan timetable specifies the precise hours and dates for each task.

	ID	Name	Jun, 2022		Jul, 2022				Aug, 2022				
			...	26 Jun	03 Jul	10 Jul	17 Jul	24 Jul	31 Jul	07 Aug	14 Aug	21 Aug	...
⠿	1	Documentation											
⠿	2	Design											
⠿	3	Test Plan											
⠿	4	Unit Test											
⠿	5	Integration Testing											
⠿	6	System Testing											
⠿	7	Acceptance Testing											
⠿	8	Project Completion											
⠿	9	Feedback											

13.   PLANNING RISKS AND CONTINGENCIES

- While doing testing of our system there remains some risks which must be addressed, one of them is budget which have the possibility to exceed as a result budget may run short. For that we will estimate budget with the current progress in project with the time we have.
- Next comes timeframe of the delivery date where deadline of project might exceed however, project still may remain incomplete. So, to mitigate that all team members who are involved with the project should sit in every week and discuss about the current progress along with meeting deadline.
- Another is client might add features every time while they are being updated about the project. In that case we will have to prioritize main functionalities or features and keep less important features in less priority list. It may again implement on next version of this system if required.
- Another contingency plan that could be implemented is usage of COTS (Commercial Off-The-Shelf) products if required.

14.   APROVALS

Team Leader	Bhuiyan, Niaz Rahman
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Test Manager	Sakib Al Habib
Project analyst	Shafayet Hossain