AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

FACULTY OF SCIENCE & TECHNOLOGY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

SOFTWARE ENGINEERING

Summer 2021-2022

Section: B, Group: 1

Report On

Online Canteen Service

Supervised By

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Submitted By

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Background Information:

This project is about an online canteen service for American International University- Bangladesh. On this campus, there are three canteens available. But there is no online service available for the canteens. As a result, students and teachers have to go the canteens and check whether their desired food is available in the campus or not. This causes late start of the classes. Also, students and the teachers suffer time waste when their desired food is not available at these canteens. Sometimes they have to go from one canteen to another, which causes time waste. In addition, in this pandemic situation, crowded places should be avoided but the canteens always crowded. This is a matter of concern now, how to solve this problem. So, an online service for the canteens should be recognized so that students and teachers can use this software to avoid crowded place as well as saving their time. This software will show everyday menu, online payment and pick up the food with online/ id card payment.

In our proposed solution, first, we have tried to ensure that the basic requirements which are displaying the menu and available food of all the three canteens online and establishing online delivery and payment system to ensure both health and time management. To do that, a system will be created which shows the menu and available food of each canteen which can easily updated by the people in canteen. It will ensure that nobody comes in search of unavailable food which will save time. Secondly, we have made a system which will deliver food and receive payment against the University ID card which will ensure health safety. In this whole system, users will have the overview of the canteens menu card. The ingredients of the food items will be described in the system, users can choose the food if there is any restriction on any ingredients of the food. Price will be mentioned, so user can have their food according to their budget. Pre booking system for any get together will be a part of the system, so that any mini celebration on the campus can go without any hassle. Teachers can have special service like when they are in one class, they can order the food and the food will be delivered to their office, they can have the food before starting next class. Students and teachers ID card will act as the credit card, some amount would be deposited into their account. By logging into the university portal account, students and teachers can pay online. In addition, if users forget to take cash with themselves, payment by ID card punch will also be another new feature of the system. There will also some discount system for the refill. By implementing this software or system overall a healthy, time saving, and users friendly environment will be introduced. There is no business objective, as there is no online based canteen that's why this decision was to build this software/ system. There will be three users for this software- students, teachers, and stuff. In current situation time loss for buying food from the canteen, unavailability of the food, unhygienic environment is the main concern to start the online canteen service. So, by using this software, users time consumption will be reduced because no one does not have to stand in line, health precautions will be preserved and the ease to have food from the canteens. The problems are mainly waste of time and health issues due to pandemic. Extensibility: It should be able to accommodate the variations like: The different order should be handled easily. It should be an option for cash on delivery, pay through card between user and canteen. Portability: this project can be portable on any platform and available on websites easily and at a faster speed than others. Reusability: All the component of this software or web page that

are used for user information should be easily get processed so that many customers can interact with us very easily and very fast without any information. Security: login and payment system should be secured enough to run the system. There are many online canteen services available in other universities of Bangladesh, but they are not feasible for AIUB's existing systems. That's why a new system which will cop up with AIUB's system is required to launch. In this system, students, teachers, and stuffs order will be processed according to the precedence of their time. For this, card system payment is very handy. This system can be used from any platform, from the portal or as a website which will consist same login system as portal. A live chat option will be available for the users so that their order can be customized by themselves. Also, the discount on refilling will attract students to use this system.

Appropriate Software Model for this project:

Our project is about online canteen service. As this project is for the AIUB canteens, the requirements are known. There is already a portal or management system for the university which will act like a framework for this system. We can consider this as a representative sample for our system, here many similarities are going to be found. Classes, databases, cloud services are the same for these two applications. Also, the requirements may not the same as portal system, but requirements type will be same. Users are the same for these two systems. Login system is same, account system is same for both systems. In addition, user interface should be more user friendly because the pictures of the food or menu should be seen properly. Main requirements of our system are- login, order, menu, or pre- order the food, payment, token system, food delivery, refill, live chat which are most common requirements and if these are implemented in the system, online canteen service system is good to be used. Analyzing all this points, we can say waterfall software development system is the most convenient one.

Waterfall model has been chosen for our software development. Our project is going to be a mini project, as we can re- use many features from the previous portal system. Our team members are new to the develop the software. As this process is very easy to understand, this process will be helpful for us to work with. Here all the requirements are clear and stable, our development team will know what and how to do. In Agile development system, the requirements keep changing. For the new developers like us, this will be a harder process to change the requirements and again doing all the steps of development. Moreover, we have done the requirements analysis, designs so that the system is well understand to us. In Agile development system, even though the analysis and design are done there could be a change in requirements in late development also, but in the waterfall process, there is no change in late development. Development will start only when the requirements are clear to us. We do not have go back to previous steps to change anything again and again. We can finish a step fully then move to next steps.

Role and responsibilities of Waterfall team:

- Business analyst: A business analyst is a person responsible for making the software product popular in the digital market. His main task is to write business strategies. He deals with the customers directly.
- Project manager: A project manager is the boss every Waterfall team. He plays the lead role in planning, executing, monitoring, controlling, and closing projects. He is in charge of the software's quality. His primary responsibility is the project management, which includes assigning duties to other team members.
- Developer: A developer is the person who writes the code. This is one of the most important roles in Waterfall teams. Waterfall programmers must avoid bugs during their work because one single defect may be a reason to run the entire project from the very beginning.
- Tester: A tester is also extremely important. In Waterfall projects, tests are usually conducted at the final stages of their realization. That is why testers must find all bugs in final products and return the software to the developers so that they can fix all defects.

Functional Requirements:

1. **Login**
    - Users and admins have to login with their user id and password.
    - System checks the user id and password.
    - If the user id and password match, then the system shows the homepage.
    - If the user id and password do not match, then the system shows the warning (user id and password does not correct please try again)
    - If user enters the wrong user id and password three times, then the system will be locked. For this reason, users need to verify their account.
    - If the users' id and password is correct, then the system shows the home page.

    Priority Level: High.

2. **Menu (admin keep and updated menu, user's check updated menu for different time)**
    - When user's login successfully then the system shows the homepage.
    - Then the system shows the all-updated menu for the users.
    - Users see the different menu for breakfast, lunch and snacks
    - Admin updates the system menu for different times breakfast item for(7-11AM), lunch (11-4 PM), snacks (4-6) and dinner for (7-10).
    - Users can see the update menu and select their needed food then user can order their perfect time.
    - The name of the food, price and the quantity of availability will be shown here.

- After choosing the right choice press next to go the payment form.

Priority Level: High.

3. **Live Chat (Admin- user interactions)**
   - This system has a live chat option.
   - To use the live chat option, go to the chat option.
   - If any user enters to the live chat option, admin will have a notification.
   - After entering to the live chat option, user will get an automated text.
   - User will ask if there are any queries about food and availability.
   - Admin will answer the questions if user asks.
   - The admin will reply within 2-3 minutes.

   Priority Level: Medium to low.

4. **Pre-Order**

   User –
   - Search the food.
   - Check the quantity of the food and the time period of the delivery.
   - If the food is not available, the user will get the notification.
   - Food quantity input will be given, pickup time for students should be maximum 40 minutes.
   - Users will get a token or code, by which they will pick up their food by themselves.
   - If the user is faculty, the food will be delivered to the office room. If the faculty is not present at the office, faculty will be notified that the food is delivered. In the case of the faculty food delivery, the highest time should be 15 minutes.

   Admin-
   - After getting pre- order request, admin will check if the quantity is available or not.
   - If the food is not available, admin will let the user know.
   - If the food is available, the admin will accept the request, A token or a code will be given to the user by which they can pick up the food.
   - Then if the user gives another request, accept then order process will be done.

   Priority Level: High to medium.

5. **Payment**

   User-
   - User will have two ways to pay.
   - Payment system with University ID card – Student can keep some amount in their ID card. While making payment, the user will input their id card and the payment is done if their account is not empty.
   - If the account is empty, the user can refill their account.
   - Users can pay by cash also.
   - If a user forgets the cash, they can punch their ID card to pay in the canteen, then they will get a code, if this code is valid, they will get the food.

   Admin-
   - Admin will accept pre order after the confirmation of the payment.

- If users are ordering food in the canteens, admin will do the select the menu and confirm the order.

Priority Level: High.

6. **Refill**
    - System has an add balance application.
    - System gives permission Input Card number.
    - Admin verifies card number with a one-time password.
    - If the password is correct user should be able to add balance.
    - If the password does not match user have to try again to add balance.
    - User input Balance how much want to add.
    - Admin refill the account.
    - If the add balance successful, user can see the update balance.
    - User will receive an email.

    Priority Level: High.
7. **Logout**
    - System has logout application.
    - If logout successful login page displayed.
    - If once logout successful for again login user must have to enter user id and password.

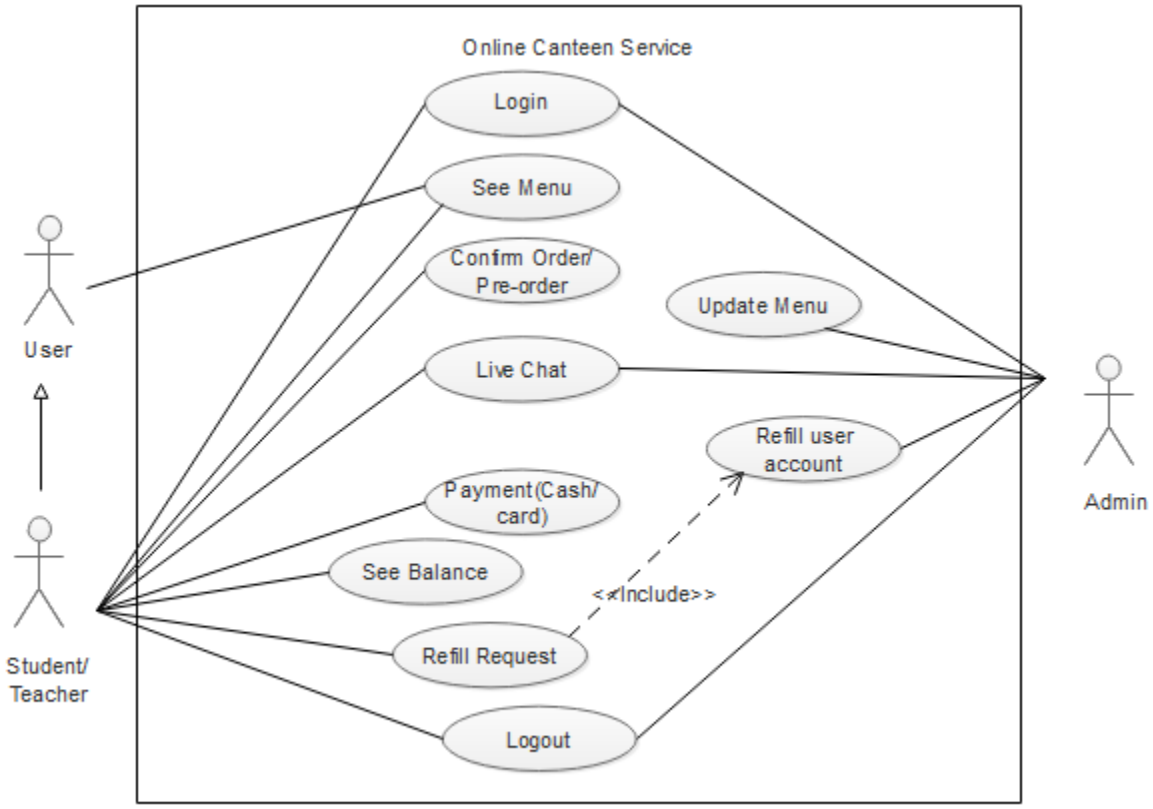
    Priority Level: Medium.

Non- Functional requirements:

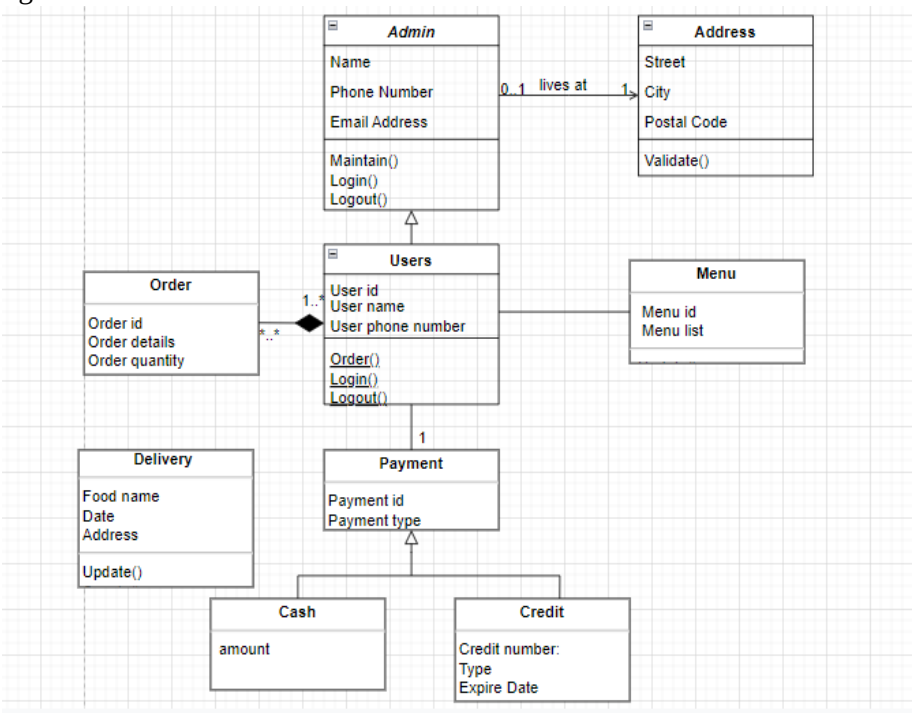
- If the users or admins are in payment form, the system will be session out.
- Users or admins cannot be login from 2 devices.
- System or the website will be accessible for everyone, but when someone needs to purchase, they have to login.
- After login the homepage should be appear within 5 seconds.
- Users or admins can use this platform with a smartphone and internet connection.
- System will be logged out after five minutes automatically.

Design:

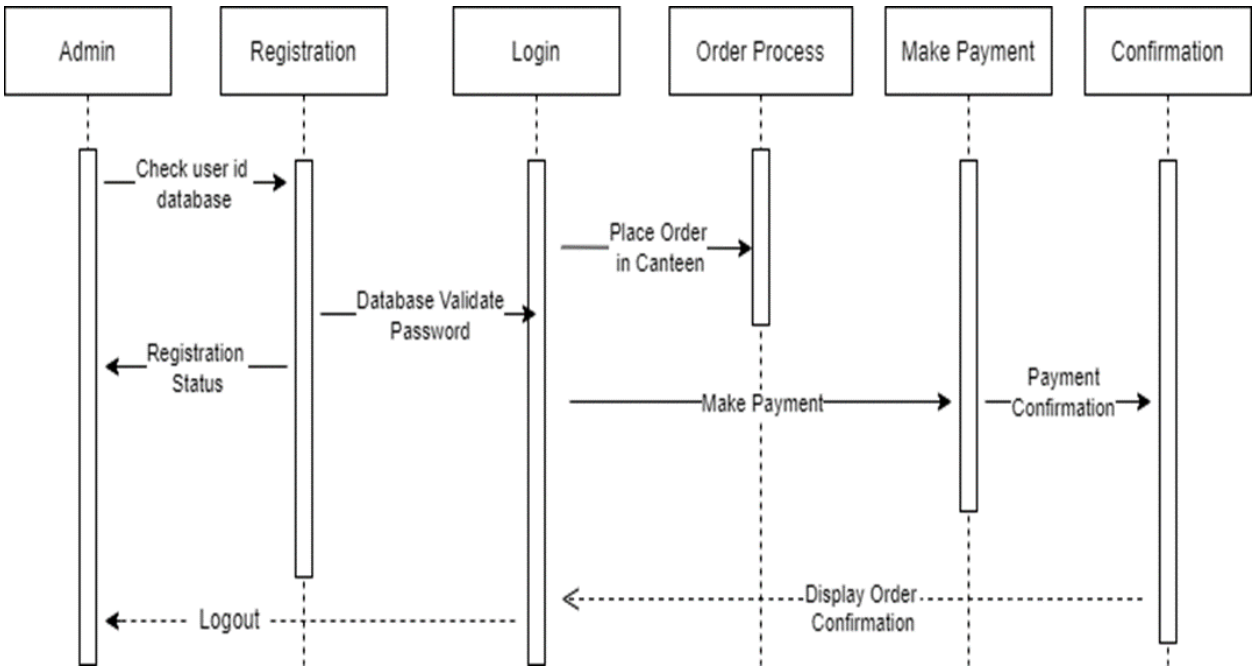
1. Use Case Diagram:



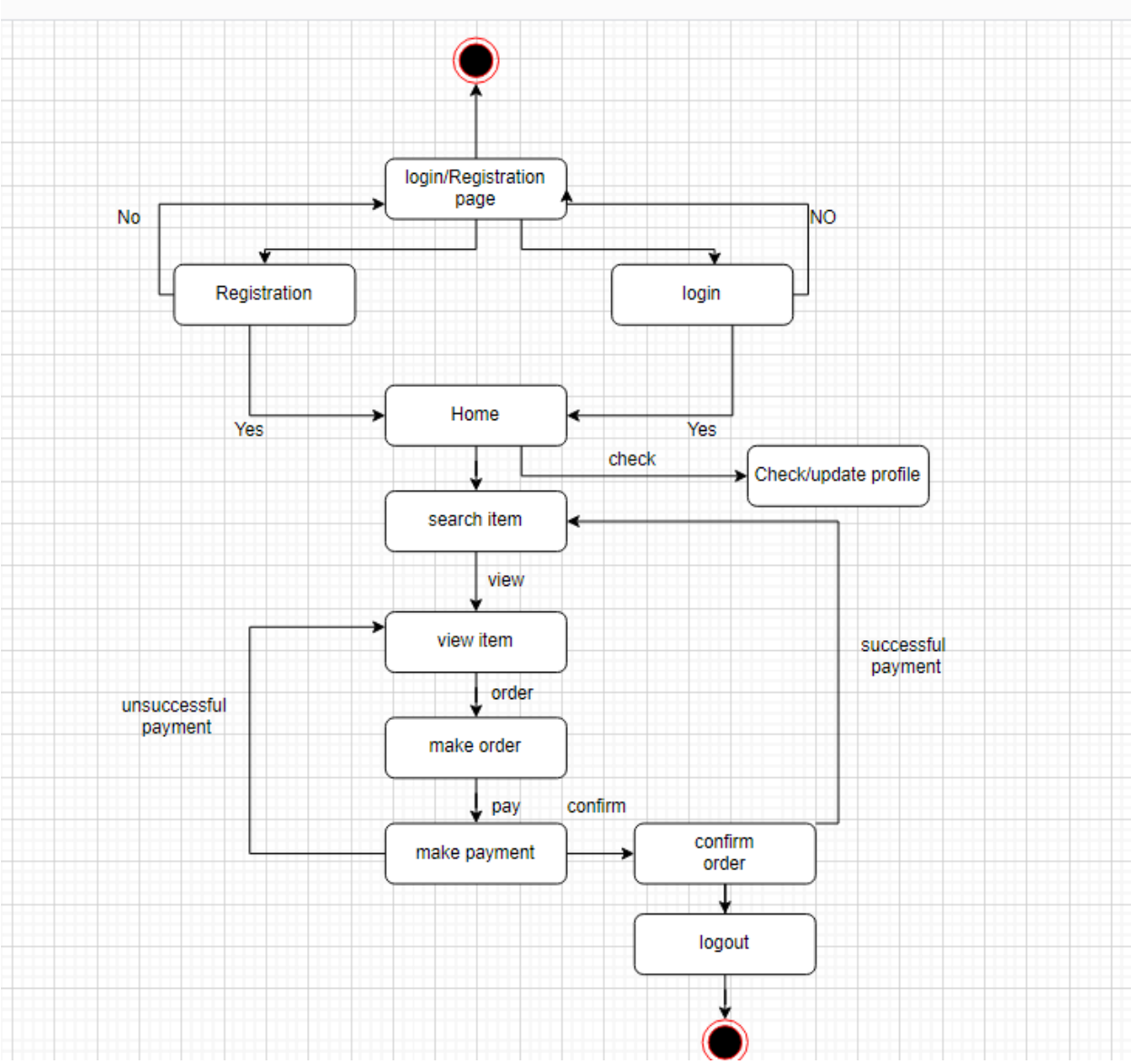
2. Class Diagram:



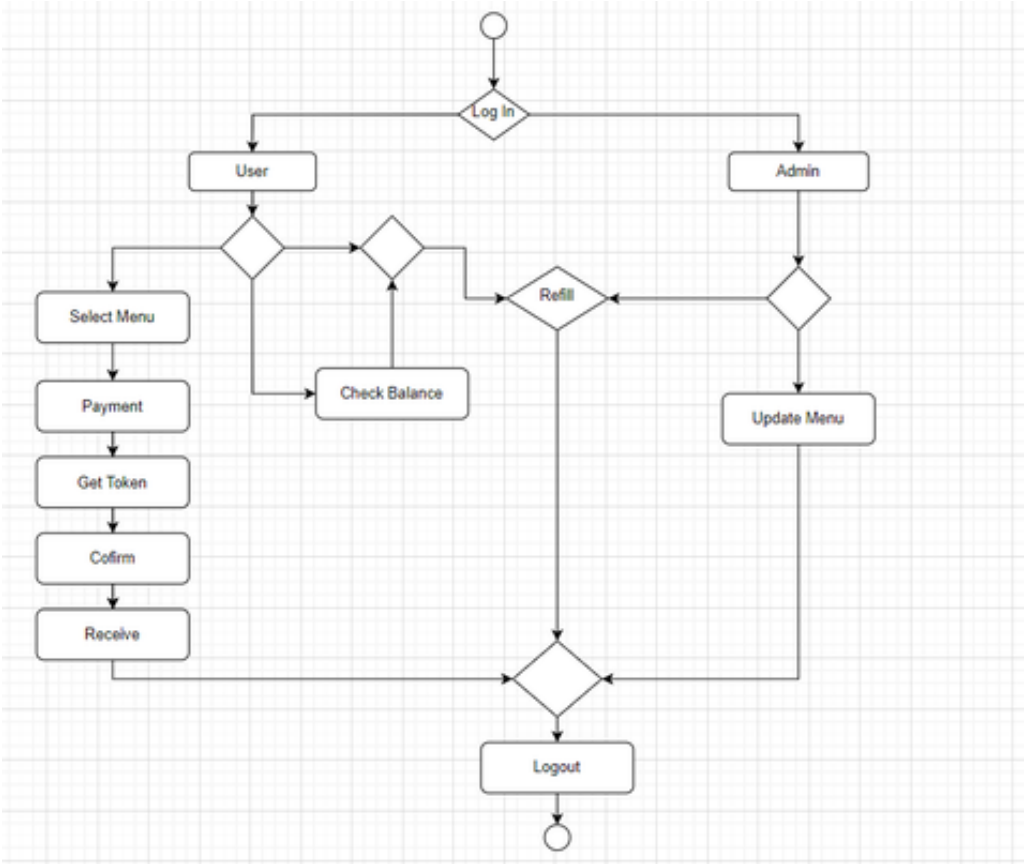
3. Sequence Diagram



4. State Diagram

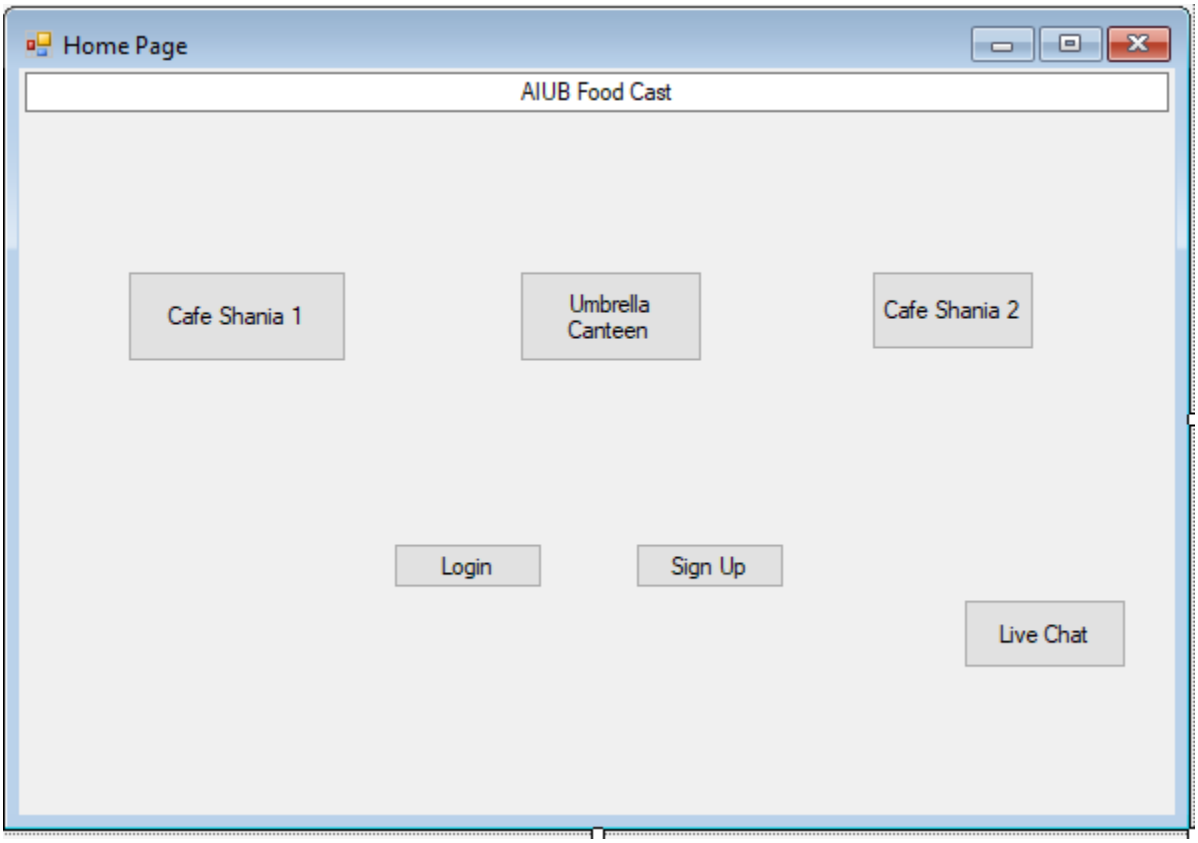


5. Activity Diagram:

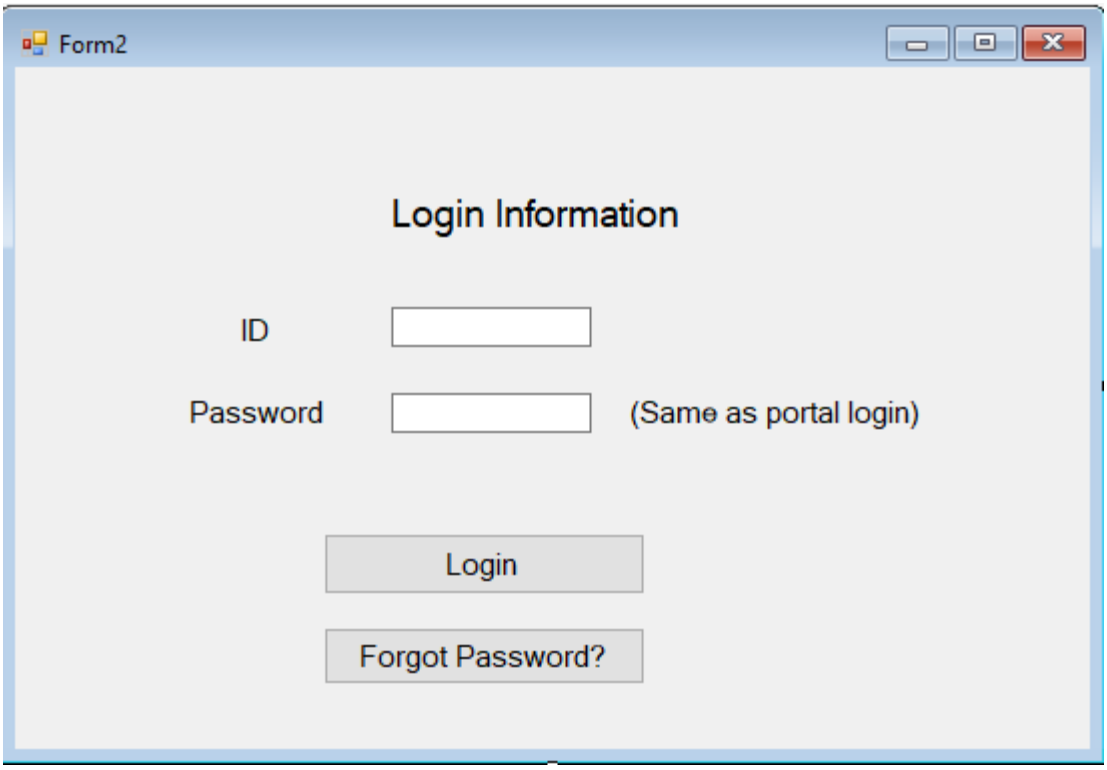


User Interface:

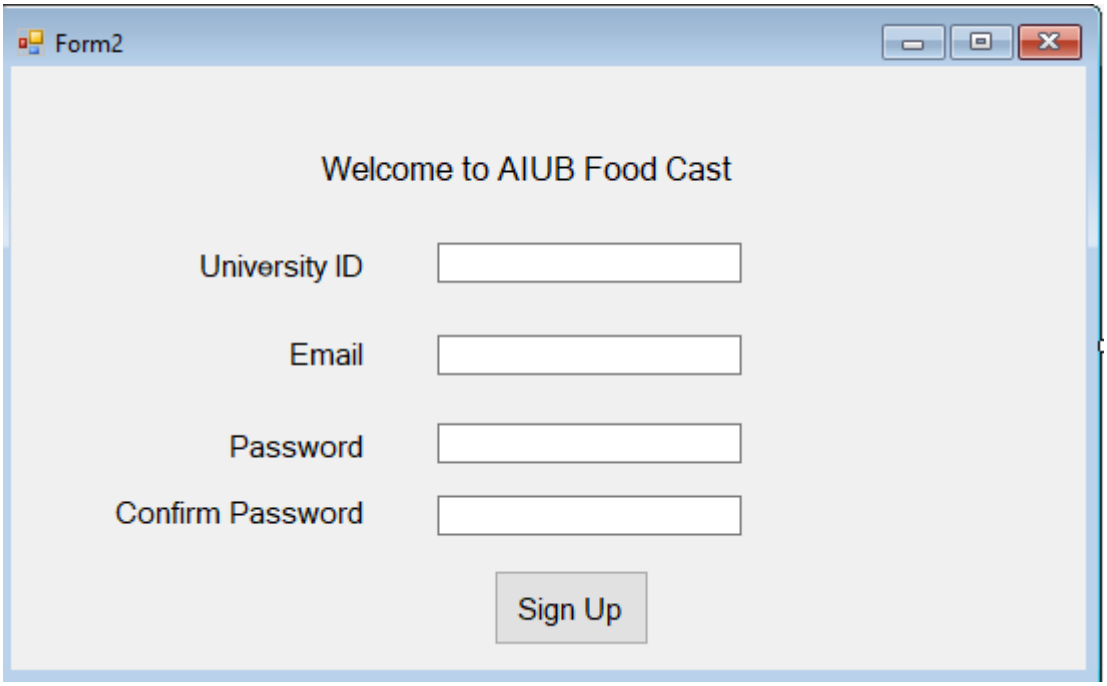
Home Page:



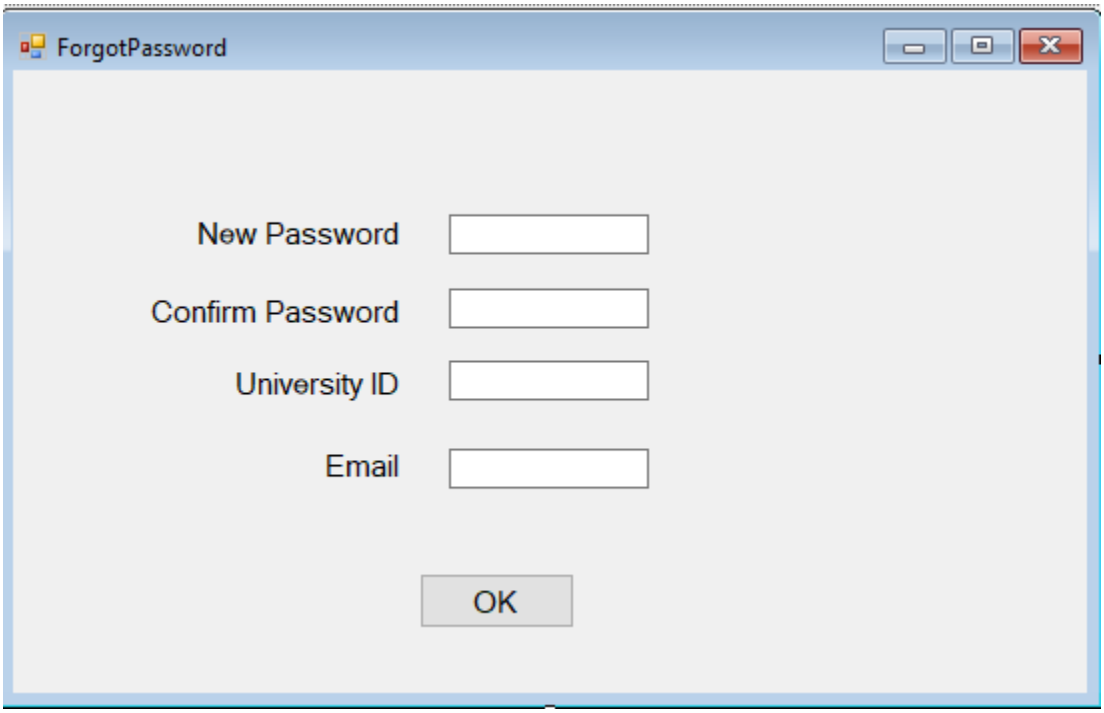
Login:



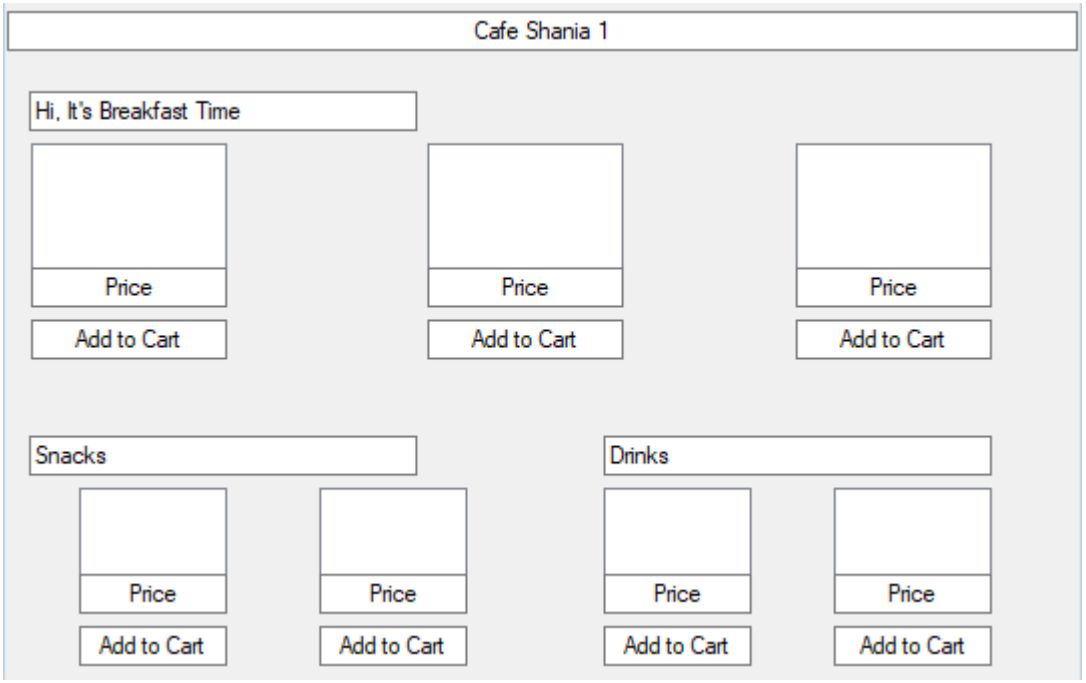
Sign Up:



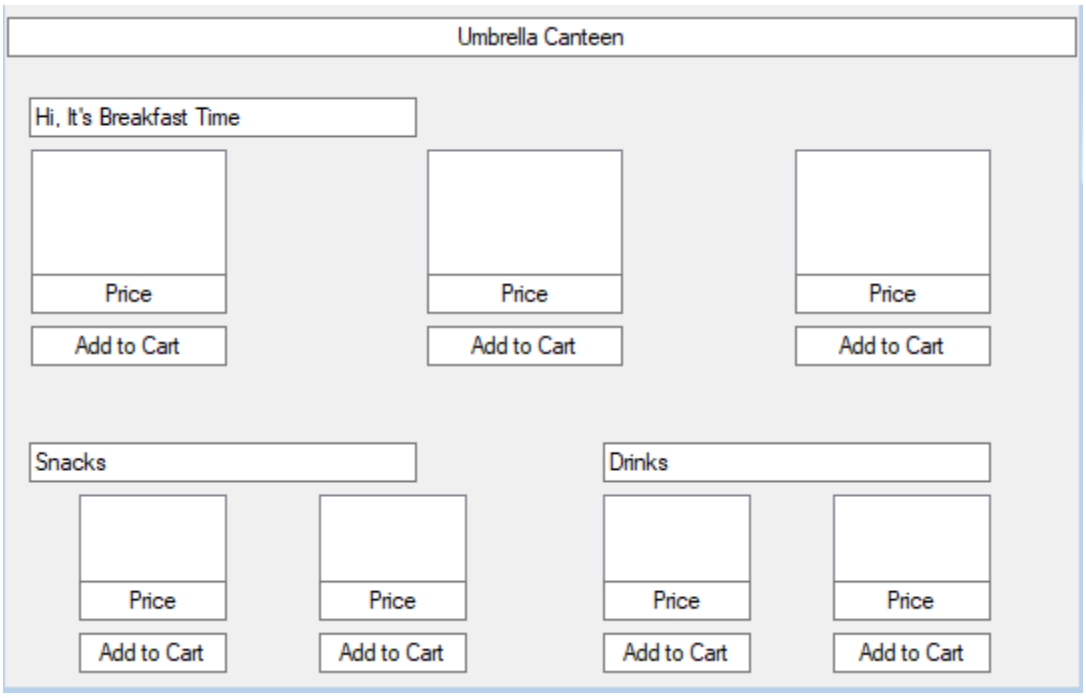
Forgot Password page:



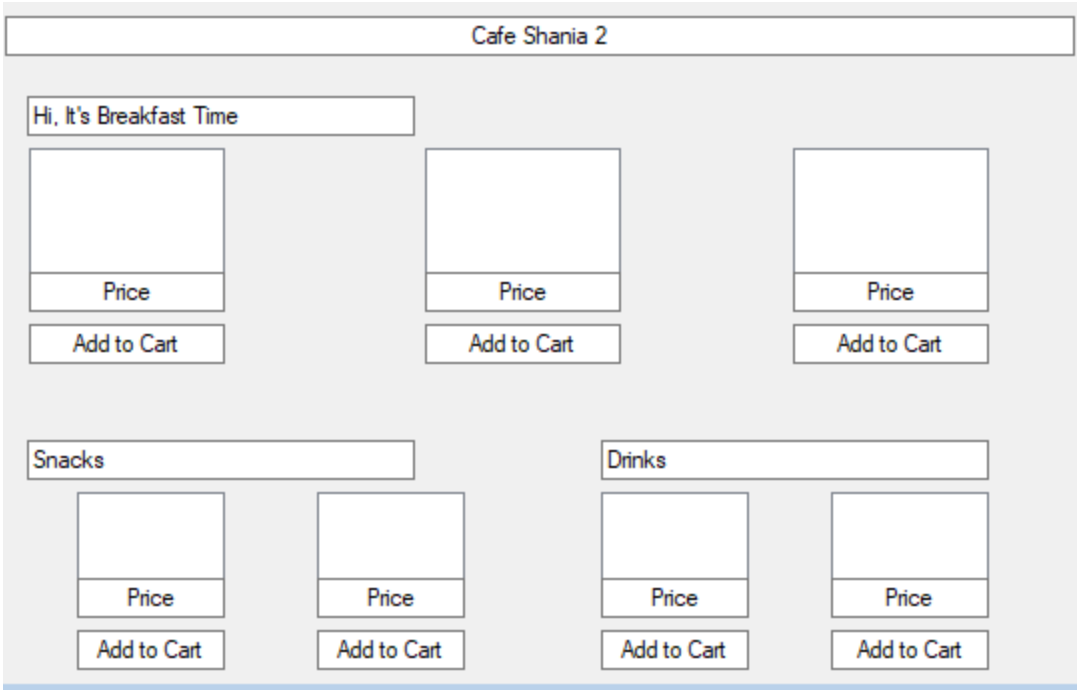
Café Shania 1:



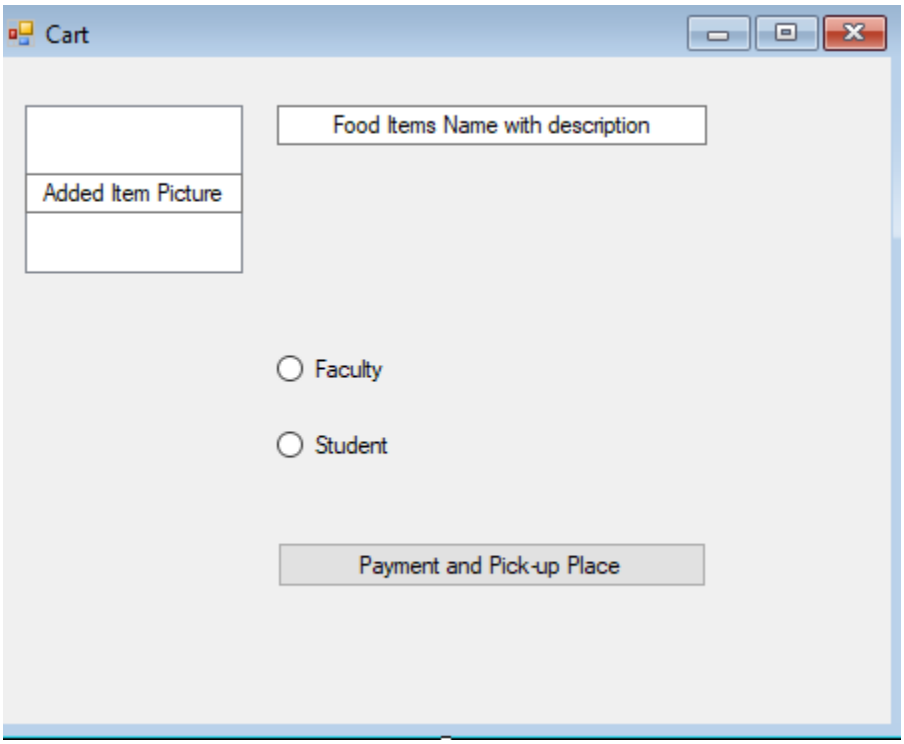
Umbrella Canteen:



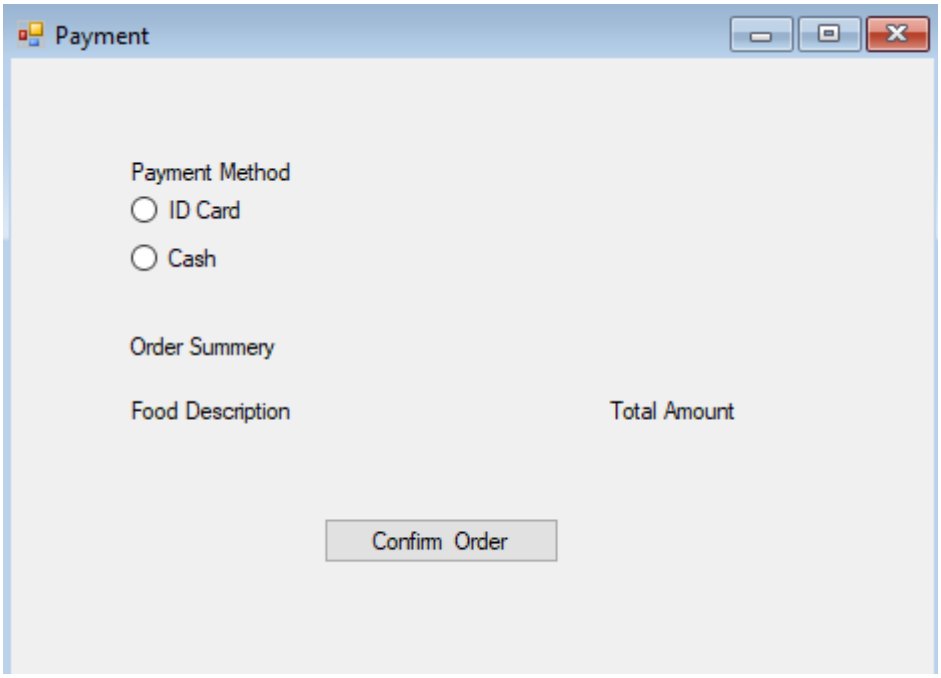
Café Shania 2:


Cafe Shania 2
Hi, It's Breakfast Time
Price
Add to Cart
Price
Add to Cart
Price
Add to Cart
Snacks
Price
Add to Cart
Price
Add to Cart
Drinks
Price
Add to Cart
Price
Add to Cart

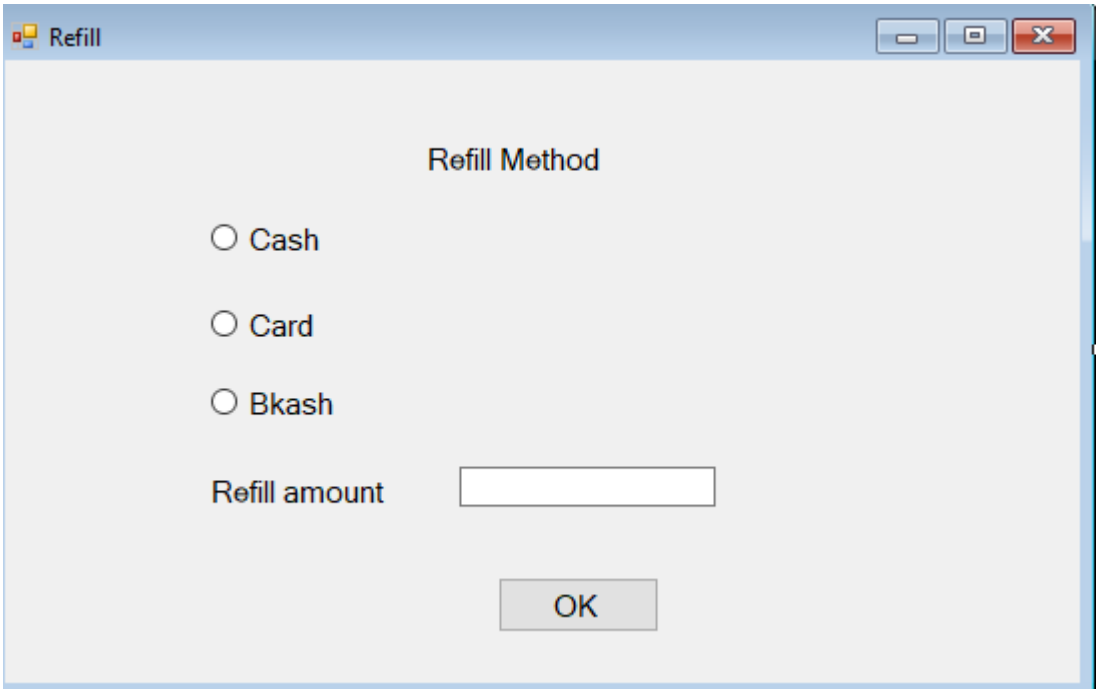
Cart:


Cart
Added Item Picture
Food Items Name with description
Faculty
Student
Payment and Pick-up Place

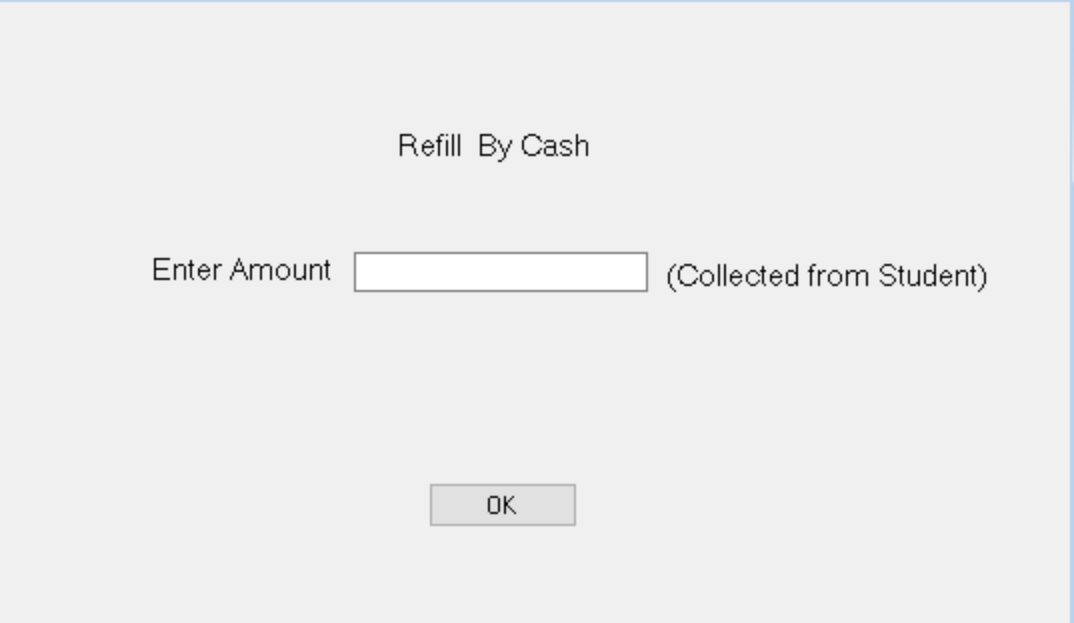
Payment:



Refill:



Refill by cash:



Test Planning:

We are doing Black box testing and white box for our system.

Our project is about online canteen service, where few classes will be used from the previous university portal system. So, the number of new classes are very few. Possibilities of integration errors and merging error are less in our project. But we need to check our functionalities. So, we are doing black box testing for our system. The advantage of this testing is the tester do not have to have deep programming knowledge. This type of testing is executed from the user's point of view, which is the main goal of us- if our system is working as we want, users are comfortable and satisfied with the requirements they wanted. The functionalities we determined before for our software, are implemented and features are working or not is also tested. Now in **white** box testing, programmers will do the unit testing where it will be checked that all the modularity for our system is merged well or not, if there is any contradiction while merging, the errors are solved right then. White box testing will assure us if we are building the right product and the black box testing will assure us if we have made the right product. Class responsibilities, errors are same or different is tested in white box testing. The infrastructure parameters are changed but still our system is working or not is also observed. The system should be platform independent; it should work in every platform. Considering all above point, the testing we will do for our software:

1. Unit testing: It will be done by the programmers when coding, functionalities of one module will be checked.
2. Integration Testing: By this testing, all modules are checked if they are working fine after merging.

3. Object-Oriented testing: It is equivalent of unit testing, the behaviors of a class for different inputs.
4. Smoke testing: It will detect any errors early by acting as a confirmation of whether the testers can proceed with further testing.

Functional requirement 1: Login

Project Name: Online Canteen Service			Test Designed by: Mah- Isha Khan	
Test Case ID: FR_1			Test Designed date: 23 July 2022	
Test Priority: Medium			Test Executed by: Mah- Isha Khan	
Module Name: Login Session			Test Execution date: 23 July 2022	
Test Title: Verify login with valid username and password				
Description: Test website login page				
Precondition (If any): User must have valid username 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 submit	Username: 20-12345-2 Password: 123	User should login into the application	As expected,	Pass
Post Condition:				

Functional requirement 2: Menu

Project Name: Online Canteen Service	Test Designed by: Mah- Isha Khan
Test Case ID: FR_2	Test Designed date: 23 July 2022
Test Priority: High	Test Executed by: Mah- Isha Khan
Module Name: Menu	Test Execution date: 23 July 2022

Test Title: Verifying menu page				
Description: Test the menu page for checking if users can select food to order				
Precondition (If any):				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. View menu page 3. Select one item to order 4. Click Add to cart	Food Item 1: Selected And added to cart (also test for multiple items)	User should add food items to cart	As expected,	Pass
Post Condition:				

Functional requirement 3: Live Chat

Project Name: Online Canteen Service			Test Designed by: Mah- Isha Khan	
Test Case ID: FR_3			Test Designed date: 23 July 2022	
Test Priority: Medium to low			Test Executed by: Mah- Isha Khan	
Module Name: Live chat			Test Execution date: 23 July 2022	
Test Title: Verifying the live chat session if it works and admin and user can chat.				
Description: Testing live chat session				
Precondition (If any):				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Click live chat 3. Leave a text 4. Wait for admin's reply	Admin replied within three minutes	User should get reply within three minutes	As expected,	Pass

Post Condition:

Functional requirement 4: Pre- Order

Project Name: Online Canteen Service			Test Designed by: Mah- Isha Khan	
Test Case ID: FR_4			Test Designed date: 23 July 2022	
Test Priority: High to medium			Test Executed by: Mah- Isha Khan	
Module Name: Pre- Order			Test Execution date: 23 July 2022	
Test Title: Verifying pre- order page				
Description: Testing Pre- order page				
Precondition (If any): User must login to the website				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Add to cart any item 3. Go to cart page 4. Click payment and pick-up page	Pick- up place should be appeared	User should get the pick- up place	As expected,	Pass
Post Condition:				

Functional requirement 5: Payment

Project Name: Online Canteen Service	Test Designed by: Mah-Isha Khan
Test Case ID: FR_5	Test Designed date: 20 July, 2022
Test Priority: High	Test Executed by: Mah-Isha Khan
Module Name: Payment system.	Test Execution date: 20 July, 2022
Test Title: Verify payment page	
Description: Test website payment page	
Precondition: User has to choose the payment system.	

Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the payment page 2. Select payment method- card or cash 3. Enter the payment amount 4. Enter Confirm Order	Payment amount: 100.00	User payment should be done.	As expected,	Pass
Post Condition:				

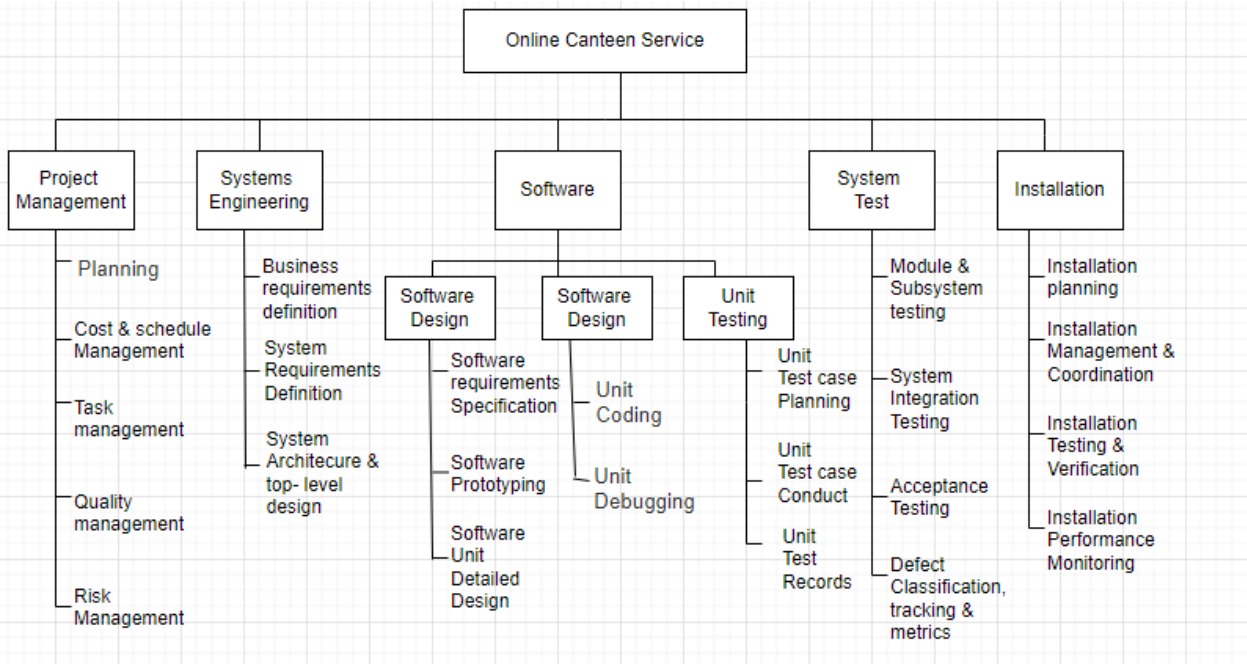
Functional requirement 6: Refill

Project Name: Online Canteen Service			Test Designed by: Mah-Isha Khan	
Test Case ID: FR_6			Test Designed date: 20 July,2022	
Test Priority: High			Test Executed by: Mah-Isha Khan	
Module Name: Refill account			Test Execution date: 20 July,2022	
Test Title: Verify Refill functionalities				
Description: Refill the account by choosing method and entering amount.				
Precondition: User has to login and if the refill method is cash, student has to submit the cash to the account office first.				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Go to the website 2. Go to the refill page 3. Select the refill method. 4. Enter amount 5. Click OK.	Amount: 500.00	User should refill account	As expected,	Pass
Post Condition:				

Functional requirement 7: Logout

Project Name: Online service canteen			Test Designed by: Mah- Isha Khan	
Test Case ID: FR_7			Test Designed date: 23 July 2022	
Test Priority: Low			Test Executed by: Mah- Isha Khan	
Module Name: Log out			Test Execution date: 23 July 2022	
Test Title: Verifying log out functionality				
Description: Testing log out page				
Precondition (If any): User has to be logged in in the website				
Test Steps	Test Data	Expected Results	Actual Results	Status (Pass/Fail)
1. Click on Log out 2. Enter username 3. Enter password 4. Click submit	Username: 20-12345-2 Password: 123	User should log out from the website	As expected,	Pass
Post Condition:				

WBS and Effort Estimation:



Activity Effort Estimation:

Effort = PM = Coefficient<Effort Factor>*(SLOC/1000)^P

$= 2.4*(\frac{6000}{1000})^{1.05}$

= 15.75

Development time = DM = 2.50*(PM)^T

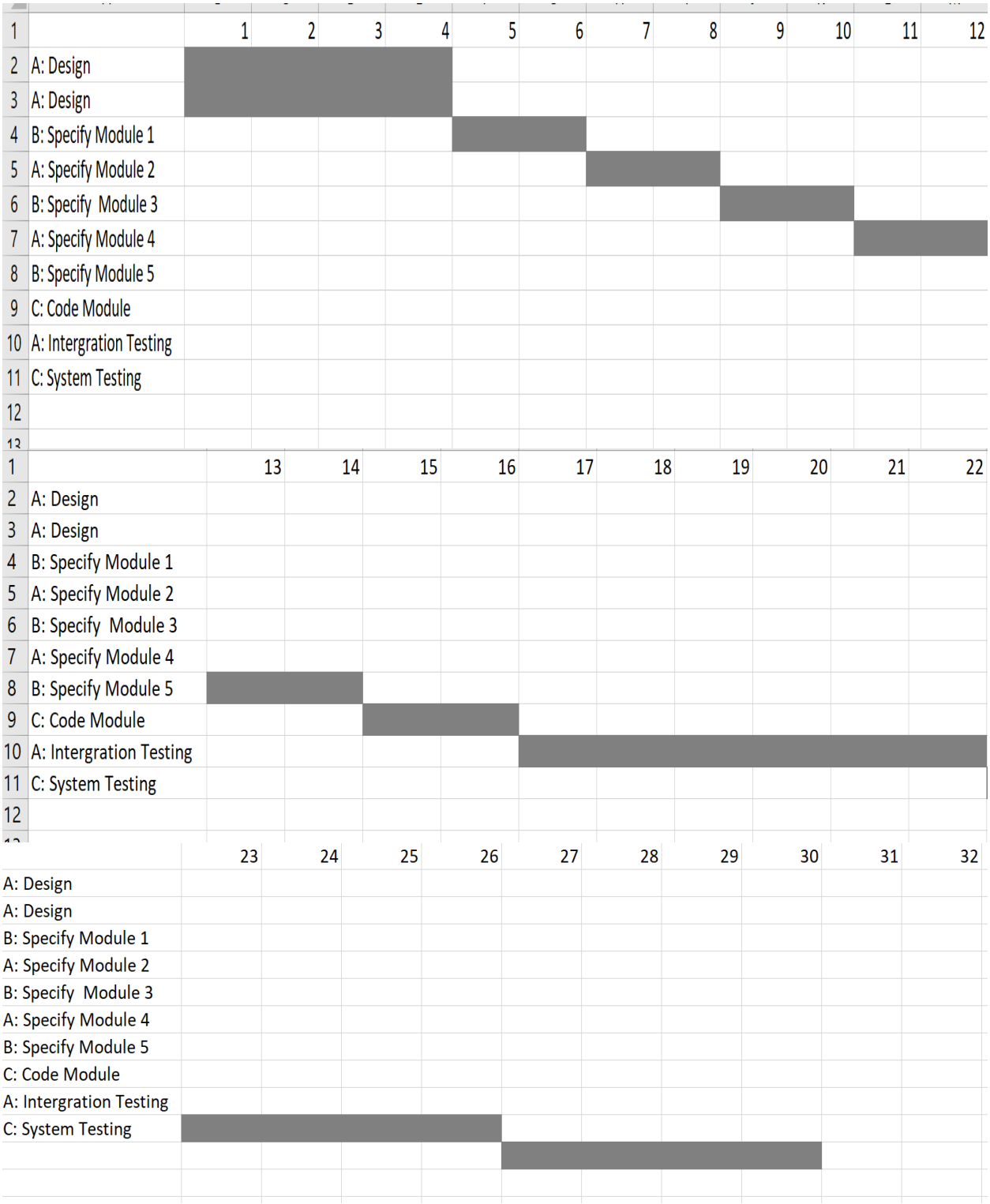
$= 2.50*15.75^{0.38}$

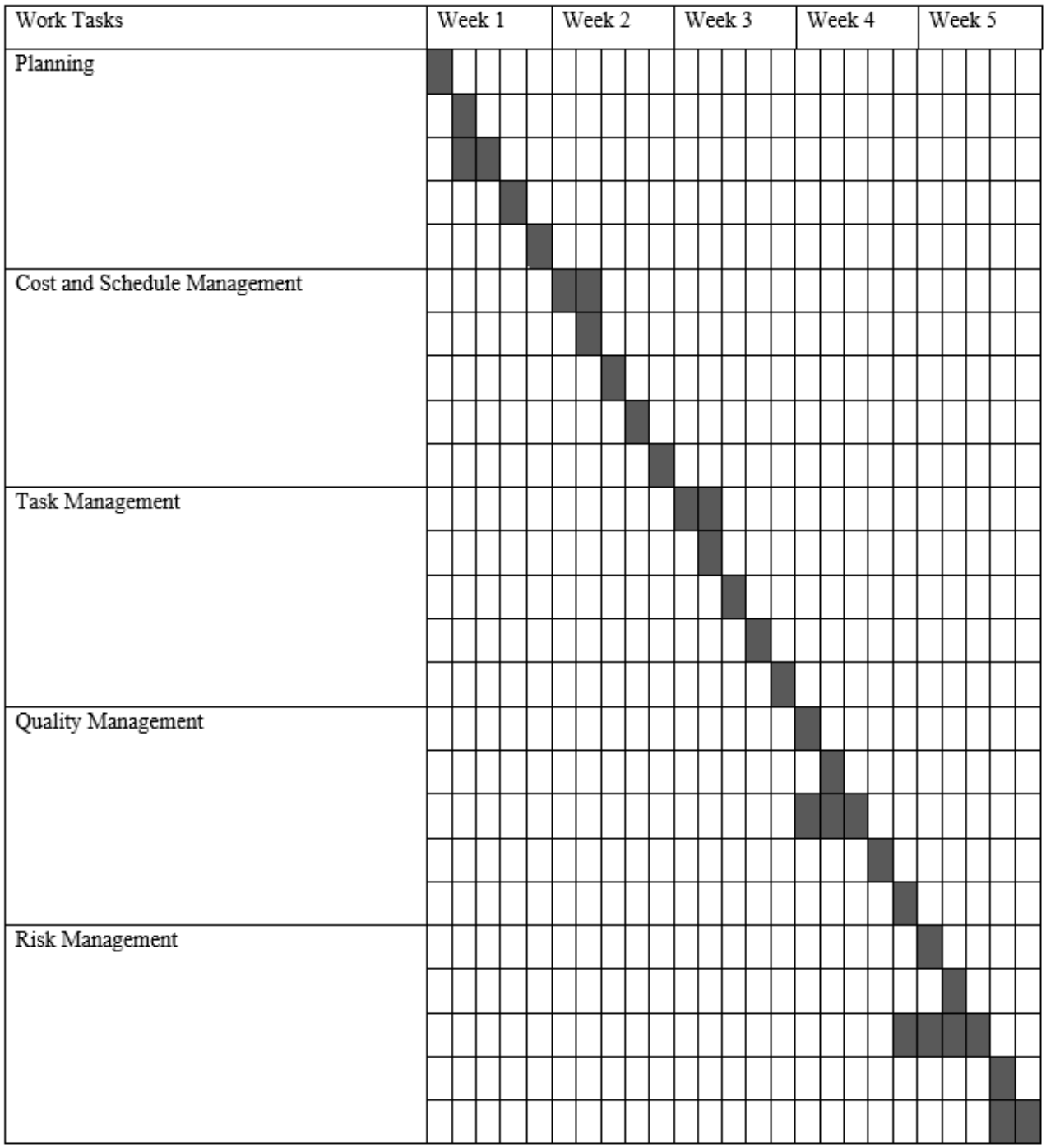
= 7.13

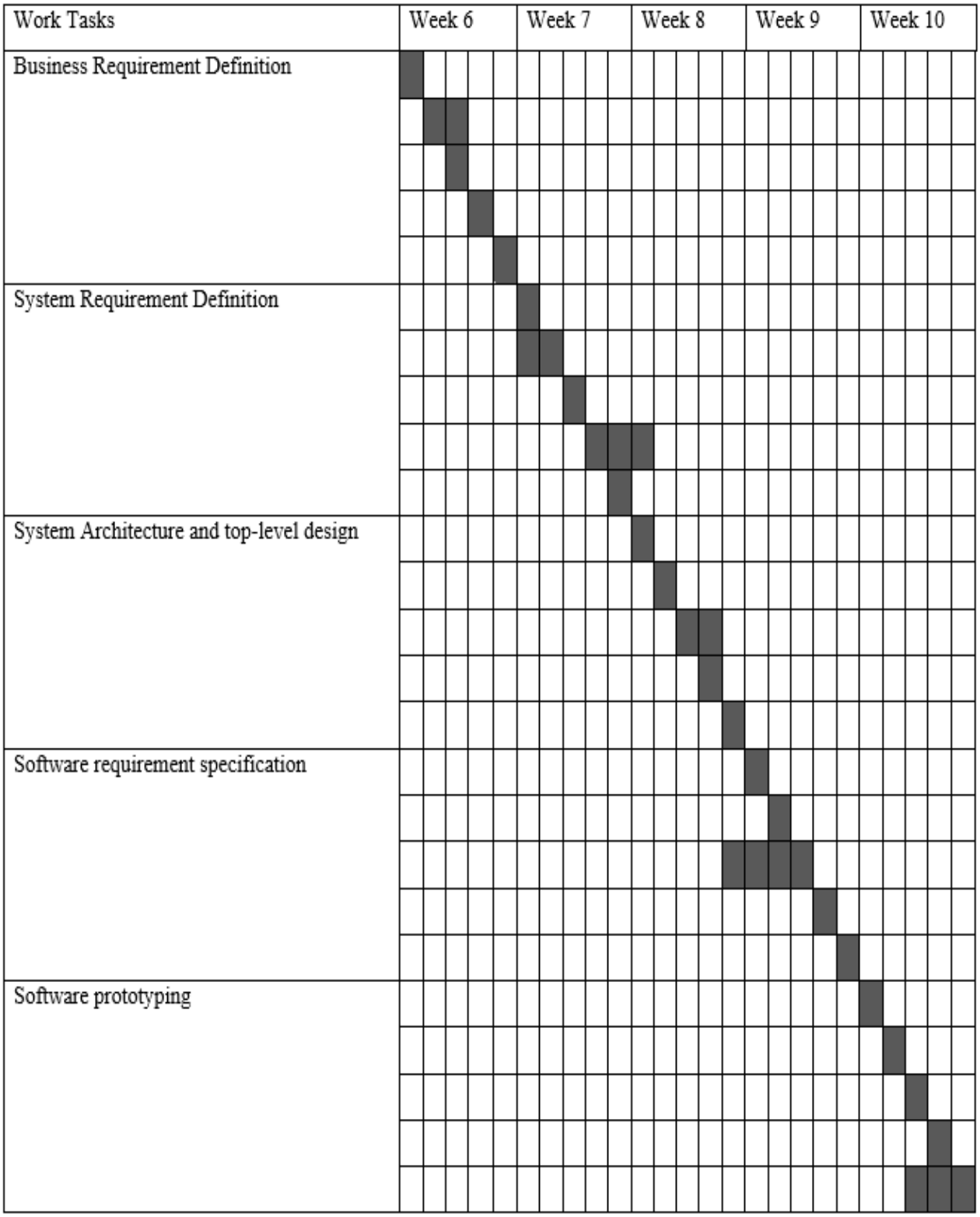
Required number of people = ST = PM/DM

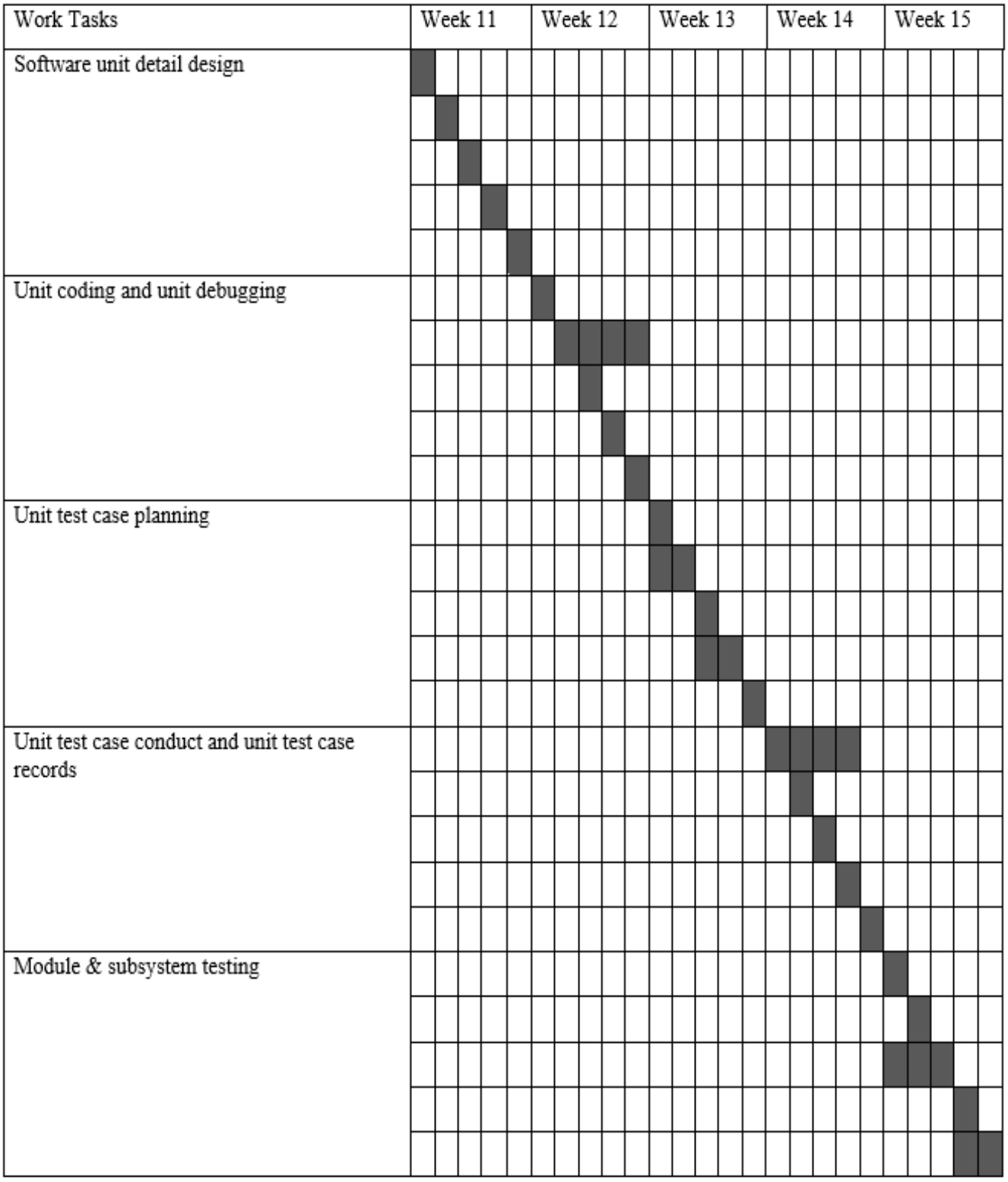
= 15.75/7.13
= 2.21
= 3

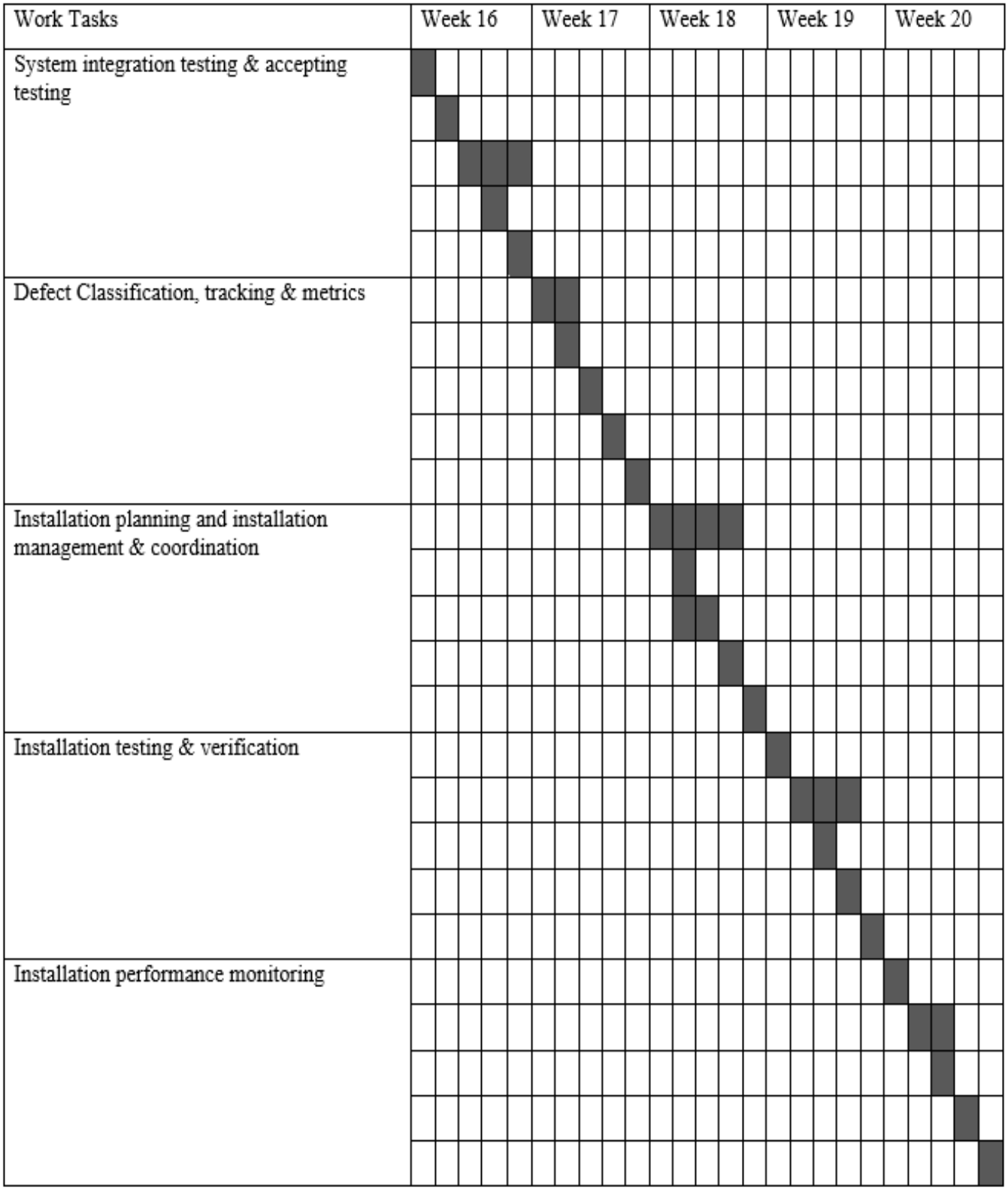
Activity Scheduling and Resource Allocation:




Work Tasks
Week 1
Week 2
Week 3
Week 4
Week 5
Planning
Cost and Schedule Management
Task Management
Quality Management
Risk Management


Work Tasks
Week 6
Week 7
Week 8
Week 9
Week 10
Business Requirement Definition
System Requirement Definition
System Architecture and top-level design
Software requirement specification
Software prototyping


Work Tasks
Week 11
Week 12
Week 13
Week 14
Week 15
Software unit detail design
Unit coding and unit debugging
Unit test case planning
Unit test case conduct and unit test case records
Module & subsystem testing


Work Tasks
Week 16
Week 17
Week 18
Week 19
Week 20
System integration testing & accepting testing
Defect Classification, tracking & metrics
Installation planning and installation management & coordination
Installation testing & verification
Installation performance monitoring

Earned Value Analysis:

Task	Planned Effort	Actual Effort
1	12	12.5
2	15	11
3	13	17
4	8	9.5
5	9.5	9
6	18	19
7	10	10
8	4	4.5
9	12	10
10	6	6.5
11	5	
12	14	
13	16	
14	6	
15	8	

Effort Estimated = 243 Person Day

BCWS = 156.50,

BCWP = 107.5,

ACWP = 109,

BAC = 243.00

1. SPI = 107.5/ 156.5 = 0.683706

2. SV = 107.5-156.5 = -49 Person Day

3. CPI = 0.99

4. CV = -1.5 Person Day

5. %Schedule for completion = 156.5/ 243 = 64.20%

6. % Complete = 107.5/ 243 = 44.24%

Risk Analysis:

RISKS	CATEGORY	PROBABILITY	IMPACT	RMMM
Size estimate maybe low	PS	50%	2	
More users	PS	40%	3	
Developing wrong function	PS	30%	1	
Extra function which is not needed	PS	60%	2	
Requirements not met	BU	80%	2	
Less Reuse	BU	50%	1	
Deadline will be tough	PS	40%	2	
Funding will be short	TE	60%	3	
Customer will add more requirement	DE	30%	3	
Not up to date	ST	50%	2	
Training tools lacking	ST	60%	1	
Inexperienced staffs	CU	30%	1	
Staff turnover will be high	ST	30%	2	

Impact values:

1-catastrophic
2-critical
3-marginal