

Carrefour Multinational Corporation

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# Project Description:

"**Carrefour**" has been a part of the English language since the 15th century. It once referred to an intersection of four roads at a single point, but later came to refer to any public square or plaza. The primary Carrefour shop (not a hypermarket) was opened in 1960, inside rural Annecy, near a crossroad. The gathering was made in 1958 by Marcel Fournier, Denis Defforey and Jacques Defforey, who attended and were influenced by several seminars in the United States led by "the Pope of retail" Bernardo Trujillo. The Carrefour bunch was the first in Europe to open a hypermarket, an enormous general store, and a retail chain under a similar rooftop. Finally the supermarket corporation is formed called **“Carrefour –French Multinational Corporation”**

The system is under control of a **CEO** which is acting as a head of the corporation. The CEO is basically the

Owner of the whole system and he is responsible of adding the corporation managers and review the decision made by managers. A corporation manager is people who is responsible of all the functionalities of the corporation like registering clients allotting them the space and apply sales decide GST and land tax and rent of shop. So in other words he is the main active member of the system the next member is counter holder a counter holder is haired by the manager and his biggest responsibility is to calculate bill of the customer. The next actor of the system is client which invests and buy a shop in corporation and sale products he may belongs to a organization or be a standalone buyer he is allotted with an account and he may pays rent for his place. The last actor of the system staff these are also haired by manager and are responsible of sale products and do office tasks the salesmen are also another entity belongs to staff the client may take one or many salesmen according to the needs of his system but not free he needs to pay the salary and flounces to that salesman.

Now lets discuss the cycle of the system the system is leaded by CEO first the CEO adds corporation manager then the corporation manager has all the authority to register the clients the manager also responsible of allotment of space to the client. First of all the client send a proposal to take place on rent he needs to provide some basic information and the manager then on the bases of the information and interview selects or rejects the requests the list of all the selected and rejected requests are then sent to CEO the CEO the review them if some of them is un appropriate then he have the authority to forcedly reject it and he send mail to manager about the rejection cause. Only when the request is approved from both the manager and CEO the clients gets the confirmation email if the client receives the mail he also have the ability to cancel his proposal but he needs to send mail to manager about the cause and basically it happens when place or the rent is not appropriate so once the requests are accepted from both ends the manager needs to provide the client an id and password of his account just like the CEO assigns the manager so through this account the manager and client are linked they can send mails the client can print his challans and receipts more over the client is capable of keep the record of the goods and sales he may add products and view the amount of sale yet the client is restricted to pay rent gst and lands tax all the amount is uploaded on his account he may pay online or print it and submit to bank the client is capable to increase the amount and apply sales on products the manager also supposed to apply sales on specific days the more the client sale products the more he supposed to pay gst the gst is calculated on per item sale a specific amount of tax is paid to organization the bill is calculated on sales point where an employee opens up his account and start calculating the bill the bill is paid through cash or debit card each shop is assigned a unique shop id and the product belongs to that id then the price is added to that particular shop owner and the sales tax is added to company account. The client have option to withdraw his sales amount. The client can cancel his membership anytime but he needs to send an email to the manager before cancelling and manager also have ability to communicate with client before approving the cancellation request. The cancellation request is rejected if the tie is less than the contracted time.

# Project Features:

* **Send Proposal :**

Client is able to send a proposal to take shop on rent.

* **Register client :**

Manager and CEO is able to accept or reject the proposal once the request is accepted manager needs register the client by giving an email, username and password.

* **Register Manager:**

CEO is able to register one or many managers for the corporation.

* **Allot Shop:**

Once a client is registered the manager is supposed to allot the shop to the client.

* **Decide Tax/Rent:**

On the time of allotting the shop the manager also select the tax and rent of the shop.

* **Register Employee:**

The manager is responsible to add employees to the system and manage their pay and data.

* **Manage Products:**

After successfully allotting the shop the client is allowed to add and manage products on his shop.

* **Apply sales:**

The sale is applicable by the both client and manager.

* **Challans:**

The client is capable to print his dues challan and pay to the organization.

* **Sales Point :**

The manager is supposed to add some sales point employee and allot them a counter and an account on this account they are supposed to calculate bill of customer.

* **Inbox:**

All the actors CEO, manager, client, staff have an inbox in there accounts so to send and receive emails.

# Technology Stack:

|  |  |
| --- | --- |
| Language(C#/Java) | java |
| Platform(Web/Desktop) | Desktop Application |
| Frontend Technology(Simple HTML/Bootstrap/any other library) | Java swings |
| IDEs | Net Beans |
|  |  |
| ***Implementation Details*** |  |
| Write down the names of all datatypes used in the code? | Integer,String,character,float,double,boolean |
| Do you have any compile time error in your code? | No |
| Do you have any run time error in your code. | No |
| Enter the names of major modules in your system. | * Manager * Client * Sales Staff |
| What is the code Size in | 10 MB |

# Project Actors:

* **MANAGER :**

A manager is a person which is responsible of all the functionalities of the system his duties are

* Accept or reject proposals
* Register and manage the clients by giving them email and password
* Register and mange staff
* Allot shops to clients
* Decide the rent and tax of shop
* Apply sale on whole the corporation on special day
* Communicate with the client and CEO
* View sales of the system and total earnings
* Cancel someone clients shop agreement
* Generating reports
* **CLIENT/SUPERVIROR:**

The client is the person which attains the shop in corporation his responsibilities are

* Send proposals
* Manage products on his shop
* Hire some sales men
* Pay rent by generating challan
* Communicate with manager
* View his total sale and GST paid
* **STAFF :**

The staff of the system is the employees of the system they are supposed to do different jobs the manager adds them and maintain their data and salary the employees are of two types one is sales men and other is sale point employee the sales point employee has following duties:

* Calculate bill of customer
* View sales of system and total GST send to corporation account
* Generate reports

# Use Cases:

All the use cases should be written in the following format. The name of use should be start with a word e.g. Add Student. It should not be as Student/ Student Add. Add Student is separate use case and Edit Student is separate use case:

## Use Case 0

|  |  |
| --- | --- |
| Use Case ID | U00 |
| Name | Welcome Screen |
| Actor | Manager, Client, Staff, Person |
| Description | This is the welcome screen of the system and it is also the login screen of the system it allows manager, staff member(sale point) staff and client to log into the system through there login ids and passwords also it allows general public to sign up as the need to take some place in the organization |
| Layout in pencil tool | welcome.PNG |

## Use Case 1

|  |  |
| --- | --- |
| Use Case ID | U01 |
| Name | Edit Client |
| Actor | Manager |
| Description | This option is used to edit the information of already added client to the system the client is added when a client sends proposal and when the manager accepts the proposal then at that stage the data is entered and after adding data is edited in this module. |
| Layout in pencil tool | 2.PNG |
| Validators | * Name validator * Email validator * Client Id validator * Phone number validator * CNIC validator |

## Use Case 2

|  |  |
| --- | --- |
| Use Case ID | U02 |
| Name | Delete Client |
| Actor | Manager |
| Description | This module s used to delete the data of client through the system when a client needs to leave or the manger decides to cancel the agreement then the data of client is removed  Once the client is deleted the data is deleted from list and the shops quantity is also updated accordingly. |
| Layout in pencil tool | 3.PNG |
| ++Validators | No validation |

## Use Case 3

|  |  |
| --- | --- |
| Use Case ID | U03 |
| Name | Search Client |
| Actor | Manager |
| Description | This option is used to search a particular client and prints its data on screen as in the table all the data of the clients not visible or some time manager doest needs to scroll down to table so he use this feature and search that particular client through id. |
| Layout in pencil tool | 4.PNG |
| Validators | No validation just enter id of client and search |

## Use Case 4

|  |  |
| --- | --- |
| Use Case ID | U04 |
| Name | Client Requests |
| Actor | Manager |
| Description | This Tab shows all the proposals send by the clients the requests are sent by clients and the manager view them in table and then he have the authority to accept or reject on clicking on accept button the **ADD CLIENT**  page appears and the manager needs to give this client an id and email and password and the place and rent and tax all the other basic data is already se t in proposal so on clicking add button the request is now send to the CEO account for approval and when CEO approves the client is added to system. |
| Layout in pencil tool | 1.PNG |
| Validators | * Name validator * Email validator * Client Id validator * Phone number validator * CNIC validator |

## Use Case 5

|  |  |
| --- | --- |
| Use Case ID | U05 |
| Name | Add Shop |
| Actor | Manager |
| Description | This use case is used to add the new shop to the system as the shops are constructed so when a shop is ready to be on rent it will be added by manager and manager needs to give each shop a shop id which is unique a address a rent amount and a tax amount so when a client give proposal he is able to view all the shops and select them |
| Layout in pencil tool | 5.PNG |
| Validators | * Shop id validator |

## Use Case 6

|  |  |
| --- | --- |
| Use Case ID | U06 |
| Name | Edit Shop |
| Actor | Manager |
| Description | This use case is used to edit the data of existing shop so for this option the shop first must be added some time there is a need to increase the shop rent or sales tax or reconstruct it so its area is changed so this option is used to edit its details. |
| Layout in pencil tool | 5.PNG |
| Validators | * Shop id validator |

## Use Case 7

|  |  |
| --- | --- |
| Use Case ID | U07 |
| Name | Search Shop |
| Actor | Manager |
| Description | This option is used to search a particular shop as there are many number of shops available in the corporation so it’s a difficult job to search one of a shop among number of shops so an easy and user friendly tool to search a particular id shop is search option the manager enters the id of shop and its data is view on screen. |
| Layout in pencil tool | 6.PNG |
| Validators | No validation |

## Use Case 8

|  |  |
| --- | --- |
| Use Case ID | U08 |
| Name | Delete Shop |
| Actor | Manager |
| Description | This use case is used to delete the data of the shop sometimes the shop needs to repair or re construct so it is un available for some times or permanently destroyed so in these cases the data of shop is deleted from the system using this use case . |
| Layout in pencil tool | 5.PNG |
| Validators | No validation |

## Use Case 9

|  |  |
| --- | --- |
| Use Case ID | U09 |
| Name | Manager Inbox |
| Actor | Manager |
| Description | The manager inbox is a communication tool which is used by the manager to communicate with the CEO and client so it enables the manager to send and receive text messages from and on a specific email address. |
| Layout in pencil tool | 7.PNG |
| Validators | No validation |

## Use Case 10

|  |  |
| --- | --- |
| Use Case ID | U10 |
| Name | Add Staff |
| Actor | Manager |
| Description | This use case is used to add the staff in the system the staff is of two types one is salesmen and second one is of sales point staff so on adding the staff the manager needs to select the category because the sales point staff is allotted with an account and salesmen are not. |
| Layout in pencil tool | 8.PNG |
| Validators | * Name validator * Email validator * Sale point Id validator * Phone number validator * CNIC validator |

## Use Case 11

|  |  |
| --- | --- |
| Use Case ID | U11 |
| Name | Edit Staff |
| Actor | Manager |
| Description | This module is used to edit the data of the staff the staff must be added first if the staff is added then the manager use this option to easily update their information and the new data is also of the accurate format otherwise data is not added and an error message is printed on screen |
| Layout in pencil tool | 8.PNG |
| Validators | * Name validator * Email validator * Sale point Id validator * Phone number validator * CNIC validator |

## Use Case 12

|  |  |
| --- | --- |
| Use Case ID | U12 |
| Name | Delete Staff |
| Actor | Manager |
| Description | This use case is used to delete some existing staff member if some staff needs to leave or someone needs to exit the corporation or manager decides to kick out some staff on that occasion this option is utilized on deleting the no of total staffs are updated in system . |
| Layout in pencil tool | 8.PNG |
| Validators | No validation |

## Use Case 13

|  |  |
| --- | --- |
| Use Case ID | U13 |
| Name | Search Staff |
| Actor | Manager |
| Description | This option is used to search a particular staff as there are many number of staff members available in the corporation so it’s a difficult job to search one of a member among number of members so an easy and user friendly tool to search a particular id member is search option the manager enters the id of employee and its data is view on screen. |
| Layout in pencil tool | 9.PNG |
| Validators | No validation |

## Use Case 14

|  |  |
| --- | --- |
| Use Case ID | U14 |
| Name | Sales |
| Actor | Manager |
| Description | This tab is used to view the total earning of the system and the total GST collected it also allows the manager to apply some kind of sale on the system like some anniversary or eid like days so this discount is applicable on all the products of the system. |
| Layout in pencil tool | 10.PNG |
| Validators | No validation |

## Use Case 15

|  |  |
| --- | --- |
| Use Case ID | U15 |
| Name | Rent |
| Actor | Manager |
| Description | This screen tells the manager that which client pays the rent and which are left so the manager can send them mail to submit there dues. |
| Layout in pencil tool | 11.PNG |
| Validators | No validation |

## Use Case 16

|  |  |
| --- | --- |
| Use Case ID | U16 |
| Name | Add Product |
| Actor | Client |
| Description | This use case is used to add the products in the system the products are added by the client and they are available for general public so they can purchase them the client is responsible of adding and maintain up the amount of products. Each product is assigned a unique shop id so when it is purchased the amount is added in that shops owners account. |
| Layout in pencil tool | 12.PNG |
| Validators | * Name Validator * Purchasing Price must be Less than Local Price * Amount Must be Non negative integer |

## Use Case 17

|  |  |
| --- | --- |
| Use Case ID | U17 |
| Name | Home Page |
| Actor | Client |
| Description | There is a home button on a screen. By clicking on this button, a panal will displayand no. of products will display there. Each entity/product contains a **View Profile Button.**  Product profile will open and you can manage or see the following items:   * Product Name * Total Amount(Available no. of products) * Total Selling(This month) * Earnings * Earning(This Month) * Calculated tax * Product ID * **Edit Product Details** * **Update Amount** * **Delete Product** |
| Layout in pencil tool | 12.PNG |
| Validators | * Product id validator |

## Use Case 18

|  |  |
| --- | --- |
| Use Case ID | U18 |
| Name | View Details |
| Actor | Client |
| Description | In this section we will display the details of the selected product. Details will be :   * Product Name * Total Amount(Available no. of products) * Total Selling(This month) * Earnings * Earning(This Month) * Calculated tax * Product ID |
| Layout in pencil tool | 13.PNG |
| Validators | No Validation |

## Use Case 19

|  |  |
| --- | --- |
| Use Case ID | U19 |
| Name | Information |
| Actor | Client |
| Description | This portion includes all information of products according to months. Number of months displayed on a list and we have to click on a month and it will open the product information according to month. Months will display from the date of joining.  There are more two options:   * All details of month (Over all) * Product wise details |
| Layout in pencil tool | 13.PNG |
| Validators | No validation |

## Use Case 20

|  |  |
| --- | --- |
| Use Case ID | U20 |
| Name | Tax and Rent Payment |
| Actor | Client |
| Description | There two panels in this option. One for paying Tax and 2nd for Paying Rent of place/Shop. |
| Layout in pencil tool | 14.PNG |
| Validators | * Payment Must be Greater than 0. * Must be Less than or Equal to payable payment. * Must be Less than or Equal to our Bank Balance. |

## Use Case 21

|  |  |
| --- | --- |
| Use Case ID | U21 |
| Name | Email Sending |
| Actor | Client |
| Description | The client inbox is a communication tool which is used by the client to communicate with the manager so it enables the client to send and receive text messages from and on a specific email address. |
| Layout in pencil tool | 15.PNG |
| Validators | No validation |

## Use Case 22

|  |  |
| --- | --- |
| Use Case ID | U22 |
| Name | Sale |
| Actor | Client |
| Description | This tab is used to view the total sale of the shop and the total gstand rent paid to the corporation more over it allows the client to apply sales on products sales are of discount type client specifies on which percentage the price is reduced. |
| Layout in pencil tool | 16.PNG |
| Validators | No validation |

## Use Case 23

|  |  |
| --- | --- |
| Use Case ID | U23 |
| Name | General |
| Actor | Client |
| Description | General option contains the some information of Client and he/she can also change it but some options required password to change the information. Sub options of General are given below:   * Name * Password * Username * Email * Clear All Data * Delete Account |
| Layout in pencil tool | 17.PNG |
| Validators | No validation |

## Use Case 24

|  |  |
| --- | --- |
| Use Case ID | U24 |
| Name | Sales point |
| Actor | Sale Point Employee |
| Description | This screen is used to calculate bill of customer a customer is a general person who come to the corporation and buy some products so the sales point is just like a counter each counter is controlled by a sale point employee he calculates bill by entering product id, quantity and shop number and bill is generated |
| Layout in pencil tool | 18.PNG |
| Validators | No validation |

## Use Case 25

|  |  |
| --- | --- |
| Use Case ID | U25 |
| Name | Sale |
| Actor | Sale Point Employee |
| Description | This screen is used to view the total number of sale of the counter and total gst paid to the corporation the Sale Point Employee is responsible to maintain all the transactions on his account |
| Layout in pencil tool | 19.PNG |
| Validators |  |

## Use Case 26

|  |  |
| --- | --- |
| Use Case ID | U26 |
| Name | Generate Receipt |
| Actor | Sale Point Employee |
| Description | When a buyer purchased some products, then sale point employee will generate a receipt of their products. You can also print the receipt from printer. |
| Layout in pencil tool |  |
| Validators |  |

## Use Case 27

|  |  |
| --- | --- |
| Use Case ID | U27 |
| Name | Manager Request |
| Actor | Person |
| Description | This proposal allowed a person to apply for a manager post the person will send the cv by filling form and the CEO after viewing the form data selects whether the person is eligible for post or not or the system needs a manager right now or not at this time. |
| Layout in pencil tool | 20.PNG |
| Validators | * Name validator * Email validator * Phone number validator * CNIC validator |

## Use Case 28

|  |  |
| --- | --- |
| Use Case ID | U28 |
| Name | Client Proposal |
| Actor | Person |
| Description | This proposal allows person to apply for the shop in the system by providing the general details and selecting the shop from the list the manager then responsible for accepting or rejecting the proposal of the client if accepts the he may allot him an id or password email etc. |
| Layout in pencil tool | 21.PNG |
| Validators | * Name validator * Email validator * Phone number validator * CNIC validator |

# Test Cases :

Test Case: 1

|  |  |
| --- | --- |
| Screen Name | Log in screen |
| Actor | Manager,Client,Staff |
| Test Case | If we write an illegal input in the login id and password field I will give us an error message |
| Screen Shoot | 1.PNG |

Test Case: 2

|  |  |
| --- | --- |
| Screen Name | Manager Registration Screen |
| Actor | Person |
| Test Case | If we leave a text box of manager registration screen empty or write in valid (false according to validation) data then it will show up an error message |
| Screen Shoot | 2.PNG |

Test Case: 3

|  |  |
| --- | --- |
| Screen Name | Manager registration objective screeen |
| Actor | Person |
| Test Case | After Entering valid manager data if we leave the objective screen blank then it will generate an error message |
| Screen Shoot | 3.PNG |

Test Case: 4

|  |  |
| --- | --- |
| Screen Name | Manager Registration objective Screen |
| Actor | Person |
| Test Case | If we write all the data correctly in fields then the manager data is added successfully |
| Screen Shoot | 4.PNG |

Test Case: 5

|  |  |
| --- | --- |
| Screen Name | Client Registration Screen |
| Actor | Person |
| Test Case | If we leave all the client fields empty in client registration form or we write any data out of validation then it will show an error message |
| Screen Shoot | 5.PNG |

Test Case: 6

|  |  |
| --- | --- |
| Screen Name | Client Registration Screen |
| Actor | Person |
| Test Case | If we write an illegal email address at email test fiels then after a while it will show an error message that email is not sending |
| Screen Shoot | 6.PNG |

Test Case: 7

|  |  |
| --- | --- |
| Screen Name | Manager Registration Verification Screen |
| Actor | Person |
| Test Case | If we leave OTP text field blank or input an in valid OTP the it will show an error message |
| Screen Shoot | 9.PNG |

Test Case: 8

|  |  |
| --- | --- |
| Screen Name | Client registration Objective Screen |
| Actor | Person |
| Test Case | If we leave the text fields empty on objective screen then it will show an error message |
| Screen Shoot | 7.PNG |

Test Case: 9

|  |  |
| --- | --- |
| Screen Name | Client Registration Objective Screen |
| Actor | Person |
| Test Case | If we correctly filled all the data then the request is sent to manager for approval |
| Screen Shoot | 8.PNG |

Test Case: 10

|  |  |
| --- | --- |
| Screen Name | Manager Shop Crud Screen |
| Actor | Manager |
| Test Case | If we does not write any data in shop crud text fields or not valid data then it will show an error message |
| Screen Shoot | 10.PNG |

Test Case: 11

|  |  |
| --- | --- |
| Screen Name | Manager Shop Crud Screen |
| Actor | Manager |
| Test Case | If We Write All data According to format and validations then the shop is added in shop table |
| Screen Shoot | 11.PNG |

Test Case: 12

|  |  |
| --- | --- |
| Screen Name | Manager Shop Crud Screen |
| Actor | Manager |
| Test Case | If we press delete or edit Button without selecting row then the error message will display |
| Screen Shoot |  |

Test Case: 13

|  |  |
| --- | --- |
| Screen Name | Manager Shop Crud Screen |
| Actor | Manager |
| Test Case | If after clicking on shop table row if we click on delete button then the shop is deleted from system |
| Screen Shoot | 13.PNG |

# User Interface Details

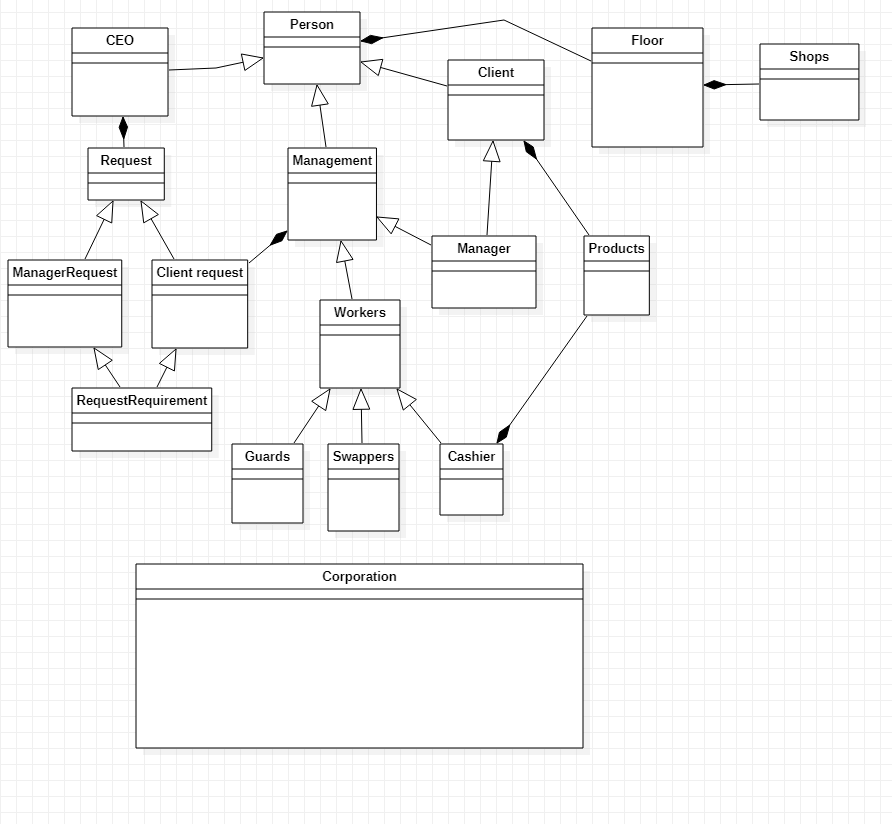
In this section, fill the table for summary that which use case will have the required component. Inside each box, write the counts for each component. If component is not used, write zero.

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Use Case Id | TextBox | DropDown | Password Box | Table | Date Field | Buttons | AutoComplete | Radio Button | CheckBox | Menu | Text Area | ProgressBar |
| U01 | 2 | 0 | 12 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| U02 | 7 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| U03 | 2 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U04 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| U05 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| U06 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| U07 | 2 | 0 | 1 | 1 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| U08 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U09 | 7 | 1 | 1 | 1 | 1 | 2 | 0 | 4 | 0 | 0 | 1 | 0 |
| U10 | 4 | 0 | 1 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U11 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| U12 | 4 | 0 | 1 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| U13 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U14 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U15 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| U16 | 5 | 1 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U17 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| U18 | 6 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| U19 | 6 | 1 | 1 | 1 | 1 | 2 | 0 | 2 | 0 | 0 | 0 | 0 |
| U20 | 3 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U21 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| U22 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U23 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U24 | 6 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U25 | 6 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U25.1 | 13 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U25.2 | 10 | 0 | 1 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| U25.3 | 7 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U25.4 | 7 | 0 | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U25.5 | 7 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U26 | 6 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U26.1 | 12 | 0 | 0 | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| U26.2 | 6 | 0 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 0 |
| U27 | 10 | 0 | 0 | 0 | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 0 |
| U28 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| U29 | 3 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 1 | 0 |
| U30 | 1 | 0 | 0 | 1 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U31 | 7 | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 0 | 0 | 0 | 0 |
| U31.1 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| U31.2 | 6 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U31.3 | 4 | 0 | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 | 0 |
| U31.4 | 1 | 0 | 1 | 0 | 0 | 2 | 0 | 2 | 0 | 0 | 1 | 0 |
| U31.5 | 5 | 2 | 0 | 1 | 0 | 3 | 0 | 0 | 0 | 0 | 1 | 0 |
| U32 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U33 | 5 | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| U34 | 5 | 3 | 0 | 0 | 1 | 2 | 0 | 2 | 0 | 0 | 1 | 0 |
| U35 | 4 | 2 | 0 | 1 | 1 | 2 | 0 | 4 | 0 | 0 | 1 | 0 |

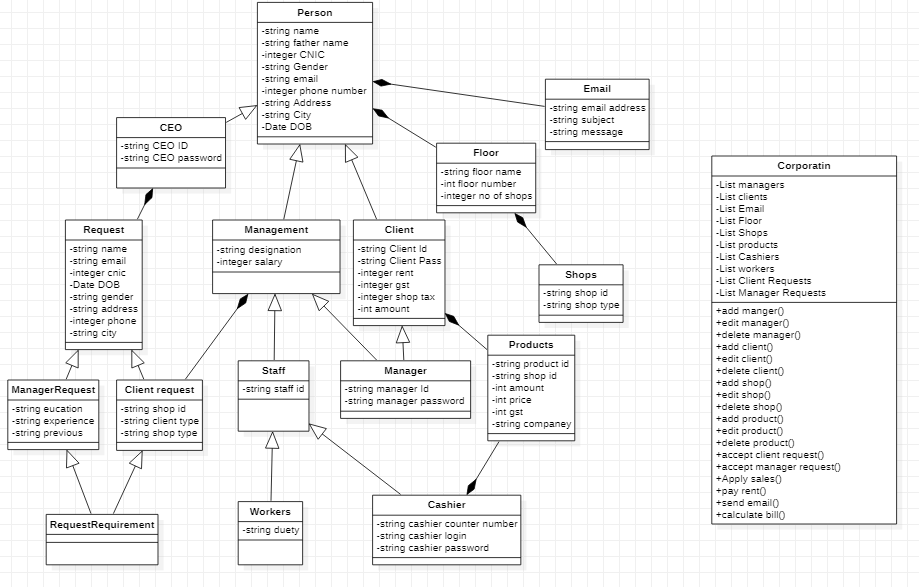
# Classes:

In this section, we do not require detailed design diagram. But identify the tentative classes with the requirement that you should have at least 10 domain classes and 5 software classes, 3 abstract classes, 2 singelton classes. Fill the following table for details. Note that class name should follow naming conventions

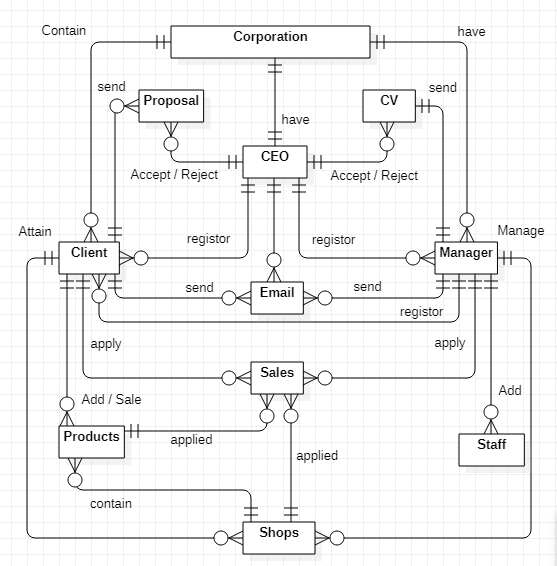
|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Class Name** | **Software/ Domain** | **Is Abstract (Yes/No)** | **Is Singleton (Yes/No)** | **Is the class will has parametrized constructor(Yes/No)** |
| Person | Domain | **Yes** | NO | **Yes** |
| CEO | Domain | NO | **Yes** | No |
| Management | Domain | **Yes** | **Yes** | **Yes** |
| Manager | Domain | NO | NO | **Yes** |
| Client | Domain | NO | NO | **Yes** |
| Worker | Domain | **Yes** | NO | **Yes** |
| Cashier | Domain | NO | NO | No |
| Guards | Domain | NO | NO | No |
| Swapper | Domain | NO | NO | No |
| RequestRequirement | Domain | **Yes** | NO | **Yes** |
| Request | Domain | NO | NO | NO |
| ClientRequest | Domain | NO | NO | **Yes** |
| ManagerRequest | Domain | NO | NO | **Yes** |
| Products | Domain | NO | NO | **Yes** |
| Floor | Domain | NO | NO | **Yes** |
| Shops | Domain | NO | NO | **Yes** |
| Corporation(main class) | Domain | NO | **Yes** | No |
| Welcome page | Software |  |  | No |
| Log in screen | Software |  |  | No |
| CEO UI | Software |  |  | No |
| Manager UI | Software |  |  | No |
| Client UI | Software |  |  | No |
| Sale point employee UI | Software |  |  | No |
|  |  |  |  |  |



**UML :**

****

**ERD Diagram:**

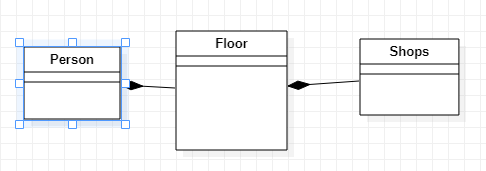
****

# Object Oriented Features:

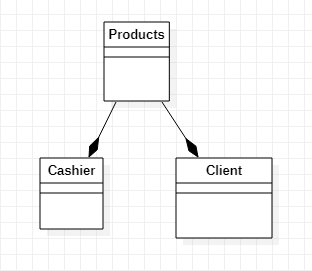
## Composition:

In this section, Identify the at least three solid examples where composition can be perform. Add UML diagram of each example.

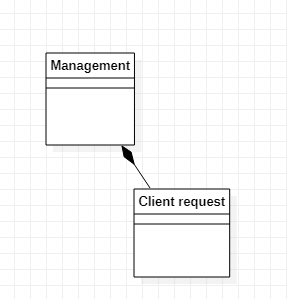
**Example 1:**



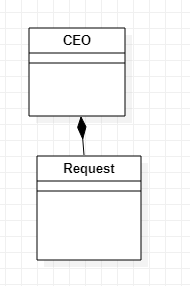
**Example 2:**

****

**Example 3:**

****

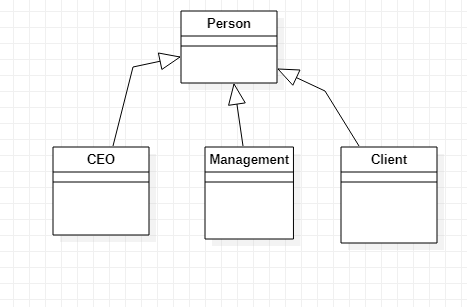
**Example 4:**

****

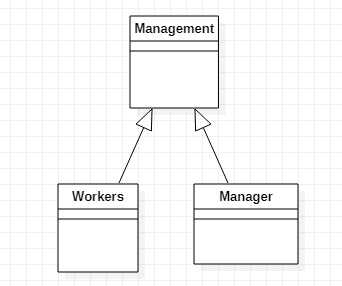
## Inheritance:

At least 2 examples where inheritance will take place with UML diagrams.

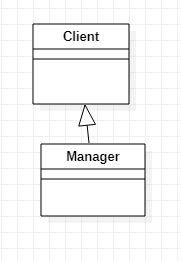
**Example 1:**

****

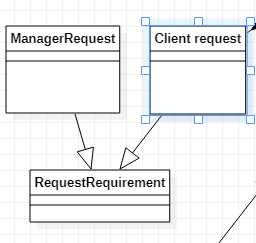
**Example 2:**

****

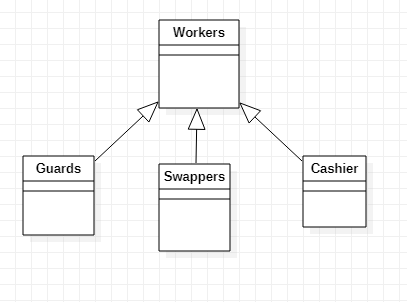
**Example 3:**

****

**Example 4:**

****

**Example 5:**

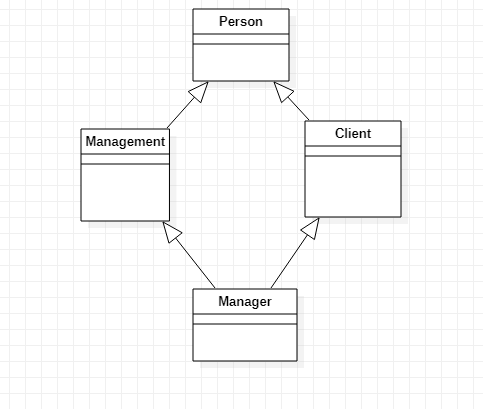


## 

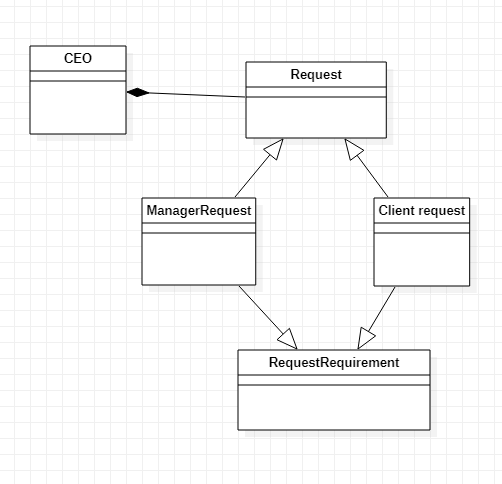
## Multiple Inheritance:

Two example with UML diagrams of multiple inheritance.

**Example 1:**

****

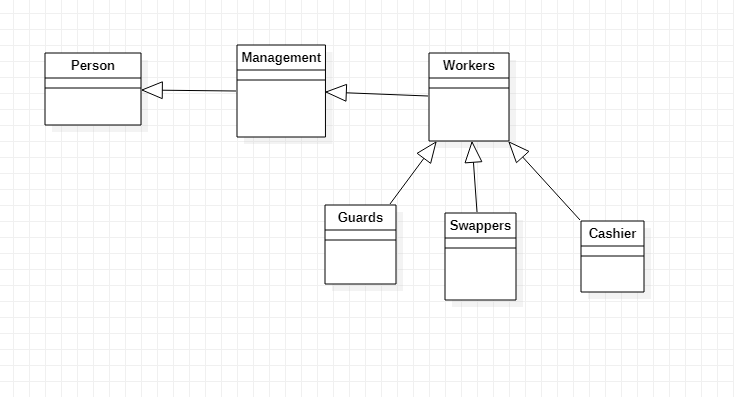
**Example 2:**



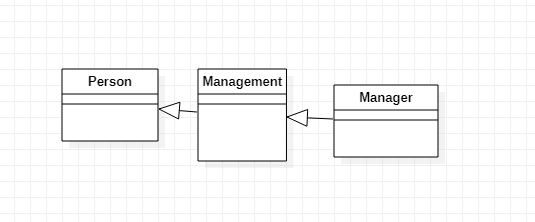
## Multi-Level Inheritance:

Two examples with UML diagrams of multi-level inheritance.

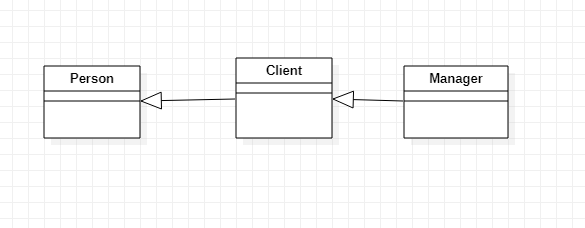
**Example 1:**

****

**Example 2:**

****

**Example 3:**

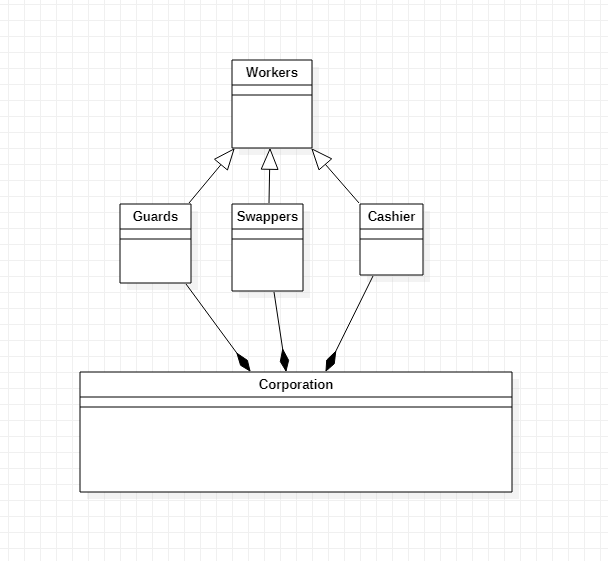
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## Polymorphism:

At least 3 examples with UML diagram for polymorphism.

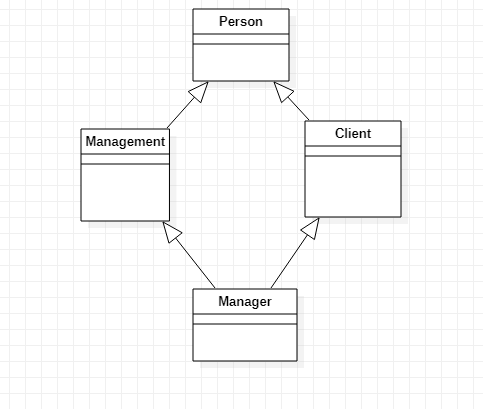
**Example 1:**

* **Worker c = new Cashier();**
* **Worker g = new Guard();**
* **Worker s = new Swapper();**



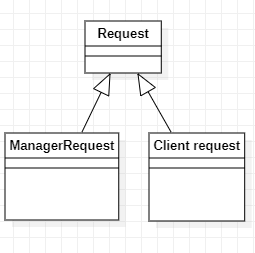
**Example 2:**

* **Person p = new Management();**
* **Person p = new Client();**
* **Person p = new Manager();**
* **Management m = new Manager();**
* **Client c = new Manager();**

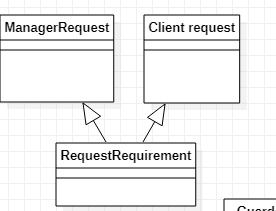
****

**Example 3:**

* **Request m = managerRequest();**
* **Request m = ClienttRequest();**

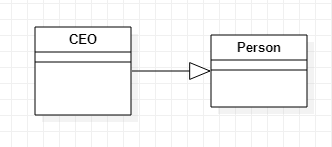
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**Example 4:**

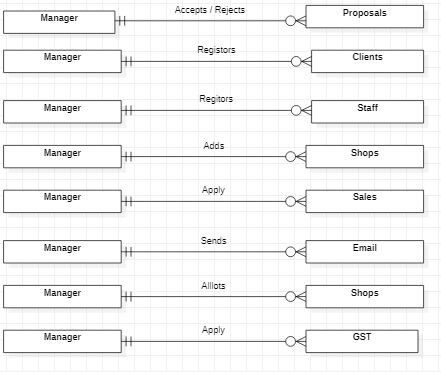
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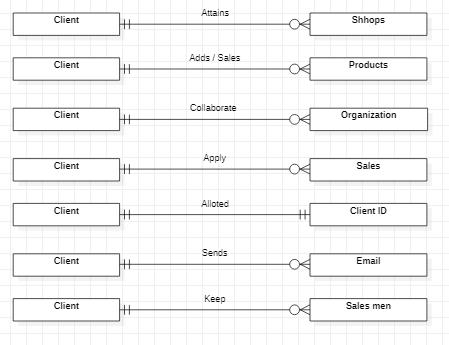
**Example 5:**

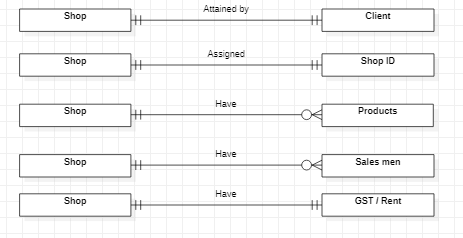
* **Person p = new CEO();**

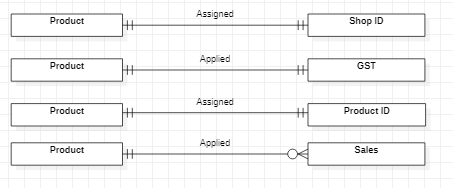
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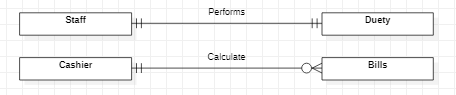
**BASIC RELATIONSHIPS:**











# Collections:

In this section, describe how and where you will use the following collections and why you are forced to use these collections.

ArrayList, LinkedList, Queue, Stack, HashSet and TreeSet

* **Link list :**

Link list are used to store data into system and the cost of searching adding and deleting the data in link list is less as compared to array list so we are using link list to store data of

* Managers data
* Clients data
* Staff data
* Products (when cashier uses)

We are forced to use link list is because the cost of performing crud on data in link list is much less as . compared to array list same task is performed with array list.

* **Queue :**

Queue is used to save data in an order data is adding into on place and extracted from other place so data is organized into a organized manner we are storing data of

* Shops

As shops are side by side in the system so we are storing data in a queue to manage the data . . effectively.

* **Set(Hash/Tree) :**

Set is used to store the data which is not to be duplicate so we are using set in our system to store data

* Products (when client adding them)

As in same shop there is no duplication of products so we are using set.

# Exceptions:

In this sections, identify at high level which type of exceptions you can face in your code and what are the solutions. Add more rows in the table as per requirements.

|  |  |  |
| --- | --- | --- |
| Type of Exception | Why this exception will occur | How you will handle the exception |
| **ArrayIndexOutOfBoundsException** | When we are accessing an array with the index greater than or equal to its size | While coding carefully deal with arrays indexes and on console tell user that you must enter specific number of letters |
| **FileNotFoundException** | When a file is no accessible or not opened and we are trying to write or read data from it | Always open a file in code before accessing it. |
| **StringIndexOutOfBoundsException** | When we are accessing string elements with indexes and we use index greater than or equal to size of string | While coding carefully deal with String indexes and on console tell user that you must enter specific number of letters |
| **ArithmeticException** | This exception occur when we violate some arithmetic rule or try to perform illegal operation like dividing a number by zero | Don’t allow user to enter invalid numeric data like not allowed user to enter 0 while dividing a number show error message and again take input |

# Data Storage:

In this sections, describe the five files with their format from where you will read or store data. In case of database table, write down the names of columns for tables. At least 5 files/ tables are required.

* **CEO.txt**

This will store information of CEO.

Name, username, email, password, phone, CNIC, gender, DOB

* **Manager Data**

**Manager.txt**

Name, Manager Id, email, password, phone, CNIC, gender, education, salary, experience, DOD, previous work, address

* **Clients.csv**

**Data of all clients will save there.**

Name, Client Id, password, email, CNIC, phone, Shop id, rent, tax, sales, shop type, client type, gender, .DOB, address

* **Products data**

There is a path where data will save:

**Products\FloorNo.\ShopID\ClientName\**

There are following files and directories:

* About.docx
* Products.xlsx **OR** Products.csv
* MonthlyProgress.xlsx **OR** MonthlyProgress.csv
* Record(stores pdf files of monthly progress)

1. January2021.pdf (generate name using formula **Month Name + Year** )

* **Workers data**

There is a folder named as **Workers** and having three files:

* **Cashier.txt/csv**

Name, Uername , password, email, CNIC, phone, gender,DOB, salary, address

* **Guards.txt/csv**

Name, CNIC, phone, gender,DOB, salary, address

* **Swapper.txt/csv**

Name, CNIC, phone, gender,DOB, salary, address

# Email Sending:

In this section, describe the points where you will be required to send the email from the code. Additionally, write down the sample subject and email content.

* **CEO:**

1. **Request Accepting:**

When CEO accepts the requests of Managers and Clients(accepted by manager), accepted persons will receive Emails.

1. **To Any person of corporation**

CEO can also send emails to any person of corporation.

1. **Firing Employee:**

When the CEO disown fire any person from company, he will receive a mail from CEO.

* **Manager:**

1. **Accepting requests of Clients:**

When manager accepts the requests of Clients and then save data, no. of accepted names will send to CEO through email;

1. **To Any person of corporation**

CEO can also send emails to any person of corporation.

1. **Remaining Dues:**

If there are some remaining dues(Tax or Rent) of any client, manager send a mail as a remainder.

* **Client:**

1. **To Any person of Corporation**

CEO can also send emails to any person of corporation

1. **Clearing Data:**

Whenever a client clear data of account, a message will send to CEO and Manager through email

1. **Deleting Account**

Whenever a client deletes his account, a message will send to CEO and Manager through email

1. **Payment**

When client pay Rent or Tax, Manager will receive a message through email

1. **Sample(Deleting Account):**

**Subject:**

Deleting an Account

**Content:**

An account has been deleted. Th information of the account has been given below:

Name: XYZ

Username: \*\*\*

Email: [abc@gmail.com](mailto:abc@gmail.com)

Organization Name: XYZ

Location: Floor Number 1 and Shop number 1

The reason of deleting account is given below:

**“------------------------”**

Thanks…!