

Problem statement

It's required to design a simple web-based email That aim to implement the basic functionalities of a mail server, including manipulation of mails, attachments and contacts and applying 5 design patterns using Angular and String Boot.

• Features available in the program

1. **Inbox:** each user has an inbox to save the coming emails
2. **Trash folder:** to hold the deleted email
3. **Composite:**
4. **Drafts:** in case the user write the message and didn't send it
5. **Filters:** so, the user can filter his mails according to specific values
6. **Searching:** the user can find any email contains the word he searches for
7. **Sort:** the user can sort his emails according to specific values
8. **Send and receive attachments:** the user can send any type of attachments
9. **Adding contacts**
10. **Removing contacts**
11. **Searching for contacts**
12. **Sort his contacts**
13. **Get his contacts information(email(s) of the contact)**

• How to use program

In our program, the user must sign up in our site to be able to use our program If the user already has an account so he should sign in to be able to send and receive his incoming emails.

Send e-mails: after clicking on “composite”, there is a white blank paper that appear to write whatever you want to send.

Delete incoming e-mails: there is a trash button, after clicking on it, the message will be saved in file called “delete”

All your outcoming e-mails are saved in file called “sent” in case you want to take a look in it again.

There is a file called “draft”: the code will save all the unsended mails in it

In case the user wants to order his emails, there is an “order” button to make it easy to order them.

In case the user wants to filter his emails, there is a “filter” button to make it easy to order them.

The search section, it is for searching for contacts, emails and words.

There is an “attachment” button, the user can select any number of attachments to send.

- **Application of design patterns**

Filter DP: it was used in filter class to control email filter operation.

DAO (data access object): it's used to control the operation done on the emails to separate it from the upper operation

null object DP: it was used to check if the user chose available email or not

Iterator: This pattern is used to get a way to access the elements of a collection object in sequential manner without any need to know its underlying representation.

- **Snapshots for the program**

[Click here](#) for snapshots

• Program UML

Backend UML

