Assignment # 02

Group Members:

1) SAFEER ALI MEHDI(FA19-BSE-051)

2) BILAL ZAMEER KHAN (FA19-BSE-019)

3) ALI ZAR KAZMI(FA19-BSE-005)

4) ALI LIAQUAT (FA19-BSE-077)

QUESTION # 01

Gmail is a complex piece of software with many different components, and it's likely that different refactoring strategies were used in different parts of the codebase. It's also possible that the Gmail team has used a variety of refactoring strategies over the years as the codebase has evolved and grown.

In general, refactoring is the process of improving the internal structure of a piece of software without changing its external behavior. It can involve techniques such as restructuring code, renaming variables and functions, and replacing old code with newer, more efficient implementations.

There are many different refactoring strategies that a developer might use, depending on the specific goals and constraints of the project. Some common strategies include:

- Extracting code into smaller, more modular functions or classes
- Removing duplication and redundancy in the codebase
- Replacing complex code with simpler, more readable alternatives
- Restructuring code to make it more modular and easier to maintain

It's also important to note that refactoring should be done in a way that minimizes the risk of introducing new bugs or breaking existing functionality. This often involves writing automated tests to ensure that the refactored code behaves as expected.

QUESTION # 02

The "Rewrite" strategy involves completely replacing an existing codebase with a new implementation. This can be a risky and time-consuming approach, but it can be necessary in some cases, such as when the existing code is too complex or difficult to maintain.

- If the Gmail development team decided to use the Rewrite strategy, they would likely follow a process similar to the following:
- Identify the goals and constraints of the rewrite. This might include things like improving performance, adding new features, or simplifying the codebase.
- Develop a plan for the rewrite. This could include breaking the project down into smaller pieces, setting milestones, and identifying any potential risks or challenges.
- Begin the rewrite. This might involve building a new codebase from scratch, or it could involve migrating pieces of the old codebase to the new implementation.
- Test and debug the new codebase. This would likely involve writing and running automated tests to ensure that the new code is working as expected.
- Deploy the new codebase. This could involve releasing the new code to a small group of users first, and then gradually rolling it out to the rest of the user base.
- It's important to note that the Rewrite strategy should only be used in cases where the benefits of a complete rewrite outweigh the costs and risks. In many cases, it may be more effective to use other refactoring strategies, such as incremental refactoring or the "Boy Scout Rule," which involves making small, incremental improvements to the codebase on a regular basis.

QUESTION # 03

(A)

Old Features

It seems that the feature of being able to switch back and forth between Inbox and Gmail, as they used the same backend, did not change. Additionally, it appears that Google received criticism for discontinuing the Inbox for Gmail service and that there was disappointment among users who lost access to certain features when it was shuttered. It is not clear from the passage if certain features remained unchanged in the Inbox for Gmail project or if any features were added or removed over the course of its development.

(B)

Newly features

- Bundles: A feature that allowed users to group together similar emails, such as newsletters or promotions, for easier organization and management.
- Pinned emails: A feature that allowed users to pin important emails to the top of their inbox so they would not be missed.
- Snoozed messages: A feature that allowed users to temporarily remove emails from their inbox and set a reminder for a later time to deal with them.
- Smart Reply: A feature that used machine learning to suggest quick responses to emails based on the content of the message.
- Hover actions: A feature that allowed users to perform actions on an email, such as archiving or deleting, by hovering their cursor over the email.
- Inline attachments and images: A feature that allowed users to view attachments and images directly within their email, rather than having to open them in a separate window or application.

(C)

Changes

It mentions that Inbox for Gmail was introduced as a stripped-down alternative user interface for Gmail that introduced new features such as

- Bundles
- pinned emails
- snoozed messages

But does not provide details on any subsequent updates or changes made to the project.

Current State

Inbox for Gmail was originally introduced as a stripped-down alternative user interface for Gmail that introduced new features such as bundles, pinned emails, and snoozed messages. However, after a while, Inbox stopped improving and it became clear that Google was no longer investing resources in it. Four years after it was launched, Google announced that it would be sunsetting Inbox, which means that the project has been discontinued and is no longer available for use. It is not clear from the passage if any further changes were made to the Inbox for Gmail project before it was shuttered.