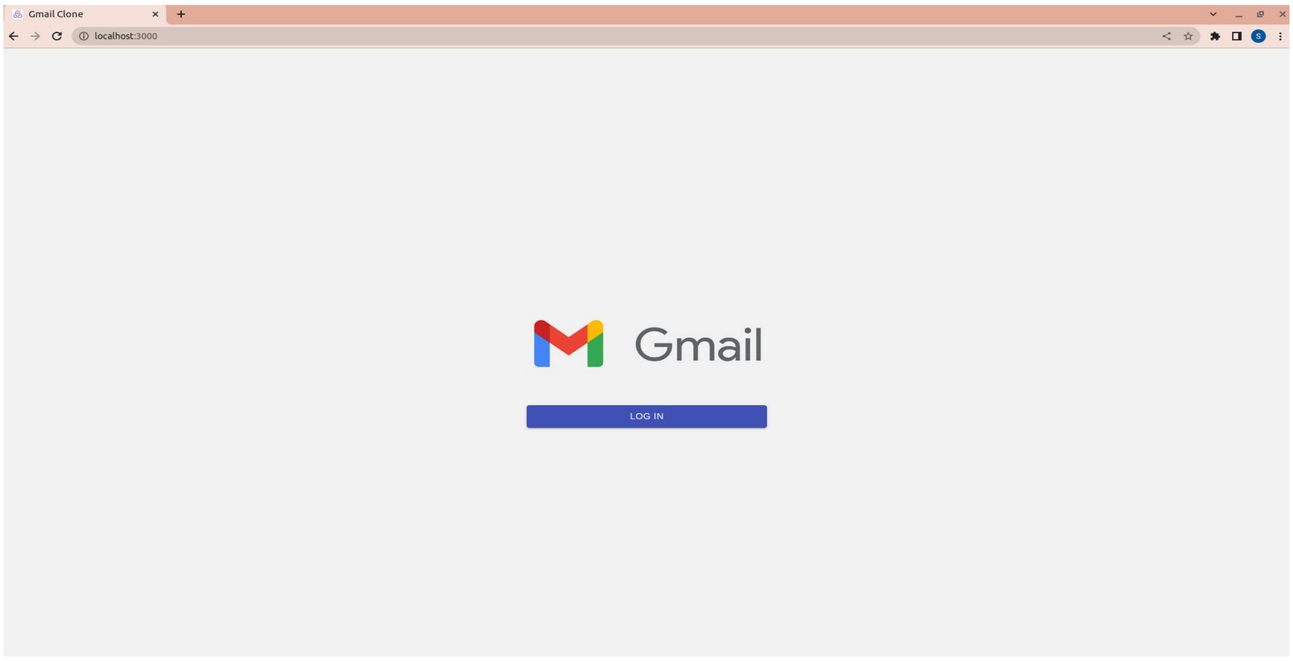
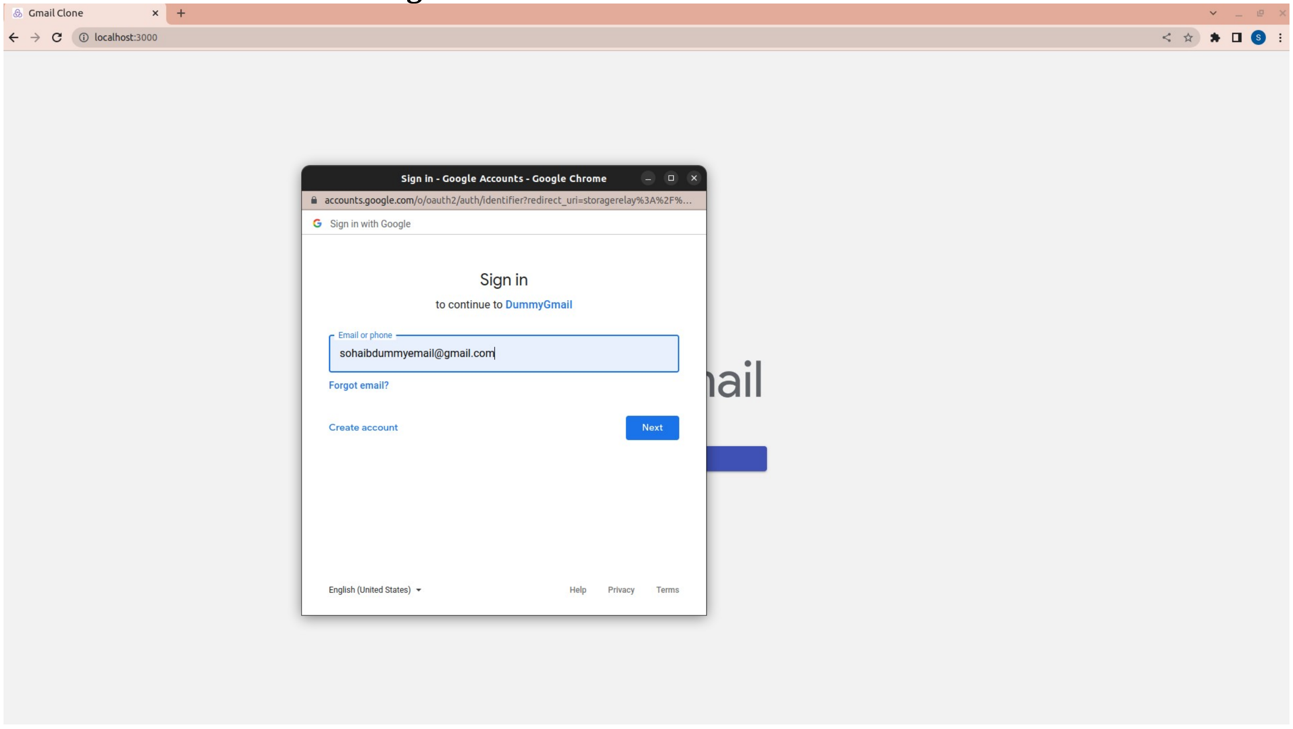
Build a React app which connects to GMAIL API and performs the following functions screens.

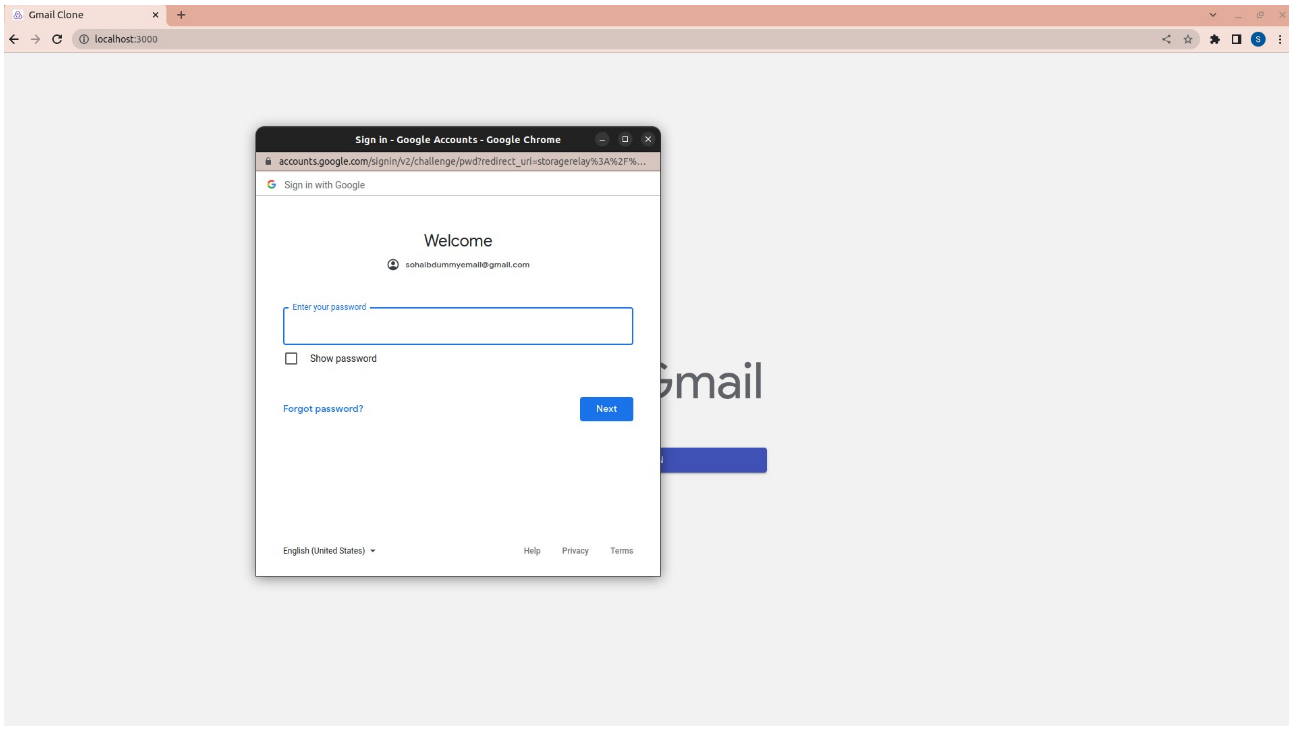
Task 1. Connect the App to GMAIL

Challenge and Planning:
Read the documentation from https://developers.google.com/gmail/api and make the API Integration to get the user ID,image and token for authorization.
Output:
The below picture will be displayed at the start when the user will click on Login Button then the user will have to enter the email and password.



Next You can enter your email and password to login.
Here is the screen for Entering Email and Password


Gmail Clone
localhost:3000
Sign in - Google Accounts - Google Chrome
accounts.google.com/o/oauth2/auth/identifier?redirect_uri=storagerelay%3A%2F%...
Sign in with Google
Sign in
to continue to DummyGmail
Email or phone
sohaibdummyemail@gmail.com
Forgot email?
Create account
Next
English (United States)
Help
Privacy
Terms



The user login information has been stored in local storage.

Task 2: Inbox must have

a. List all messages using pagination

b. List Unread message

Planning:

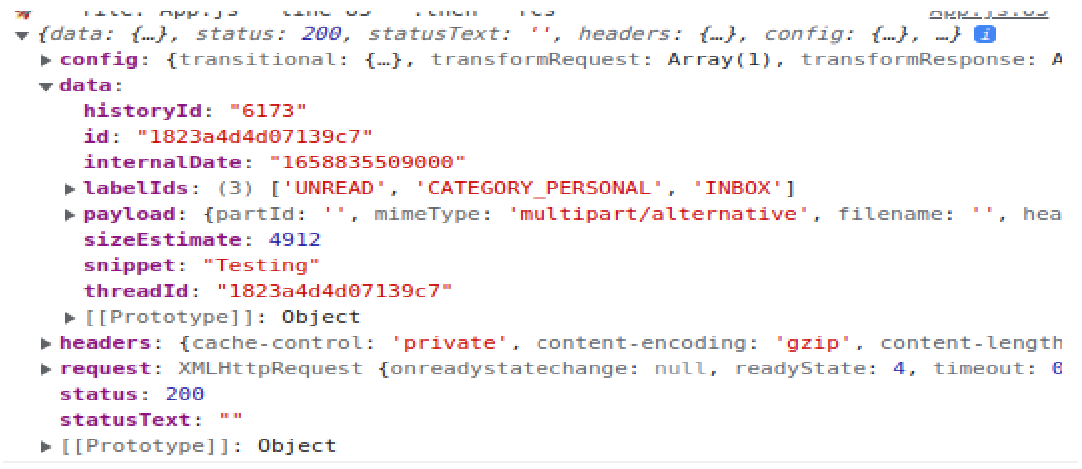
Read the documentation for listing the inbox messages. From the previous task, I have the User Unique ID and authorization token to get access to user messages.

Challenge:

The challenge here was that the GMAIL API does not return the list of inbox messages directly. At first, it sends me a list of IDs of the messages. Then base on that id, I have to fetch the particular message.

Solution Provided:

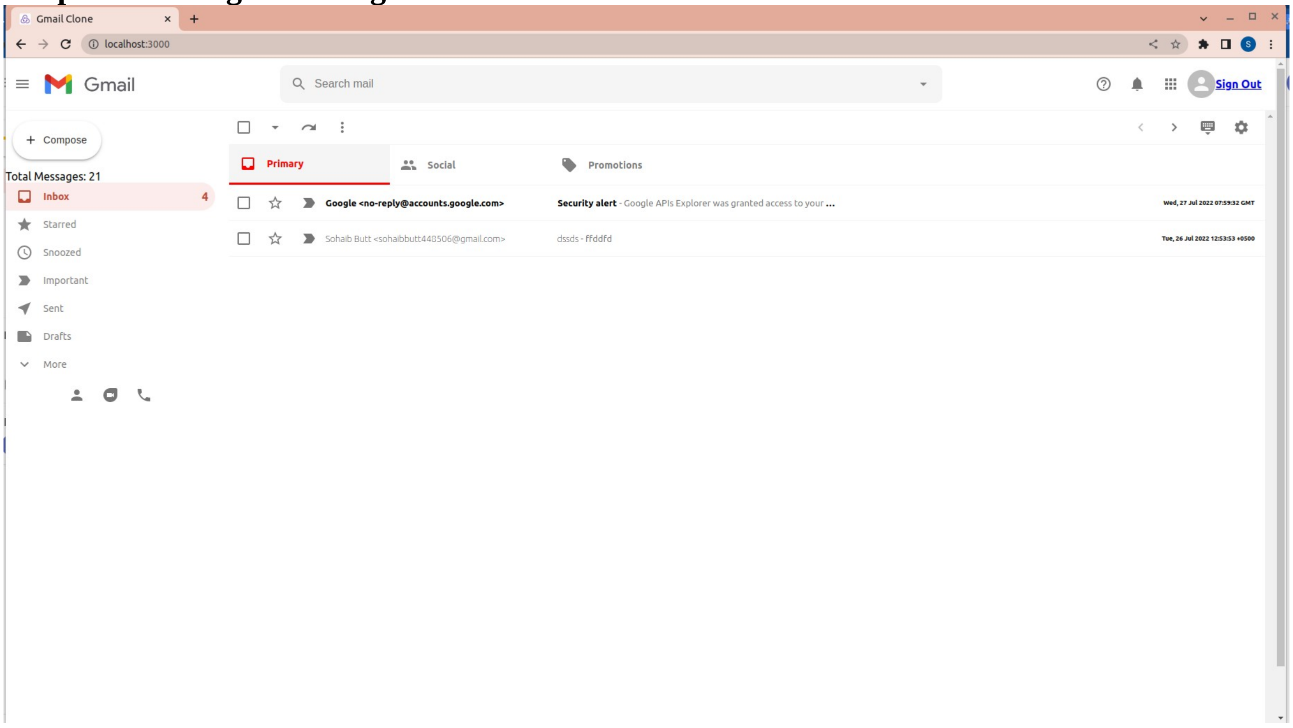
when the User login the API is called to get the list of IDs of inbox messages. I stored these IDs and then do the API call to get the messages and store them in the redux. The next challenge was to display these messages. The response coming for a message was as shown below:



```
▼ {data: {…}, status: 200, statusText: '', headers: {…}, config: {…}, …} i
  ▶ config: {transitional: {…}, transformRequest: Array(1), transformResponse: A
  ▼ data:
      historyId: "6173"
      id: "1823a4d4d07139c7"
      internalDate: "1658835509000"
    ▶ labelIds: (3) ['UNREAD', 'CATEGORY_PERSONAL', 'INBOX']
    ▶ payload: {partId: '', mimeType: 'multipart/alternative', filename: '', hea
      sizeEstimate: 4912
      snippet: "Testing"
      threadId: "1823a4d4d07139c7"
    ▶ [[Prototype]]: Object
  ▶ headers: {cache-control: 'private', content-encoding: 'gzip', content-length
  ▶ request: XMLHttpRequest {onreadystatechange: null, readyState: 4, timeout: 0
    status: 200
    statusText: ""
  ▶ [[Prototype]]: Object
```

The challenge was to re structure it to get the required things to display. I manually re structured this for getting ID, subject, time, to, snippet and labels. The labels is for unread messages. If the message will be unread , then it will be bold and API response will have the label of “UNREAD”.

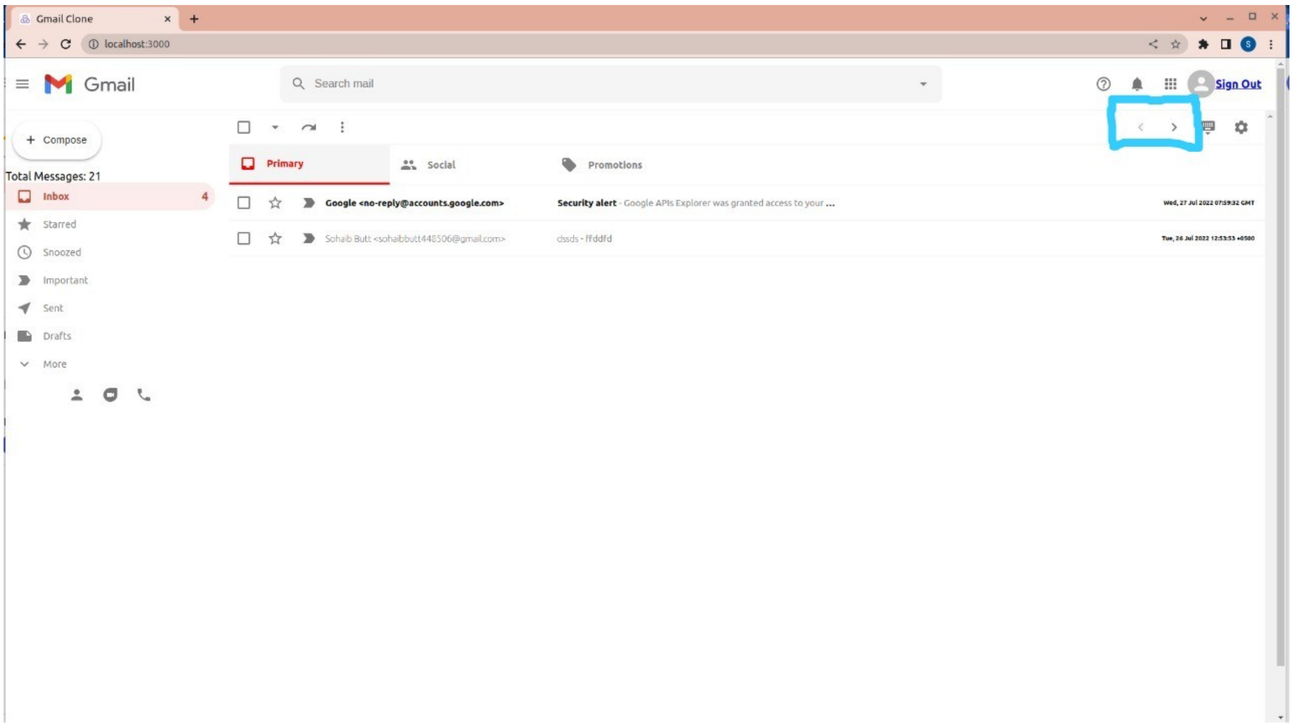
Output of Listing of Messages:



```
Google <no-reply@accounts.google.com>    Security alert - Google APIs Explorer was granted access to your ...    Wed, 27 Jul 2022 07:59:32 GMT
Sohaib Butt <sohaibbutt448506@gmail.com>    dssds - ffddfd    Tue, 26 Jul 2022 12:53:53 +0500
```

Challenge for Pagination:

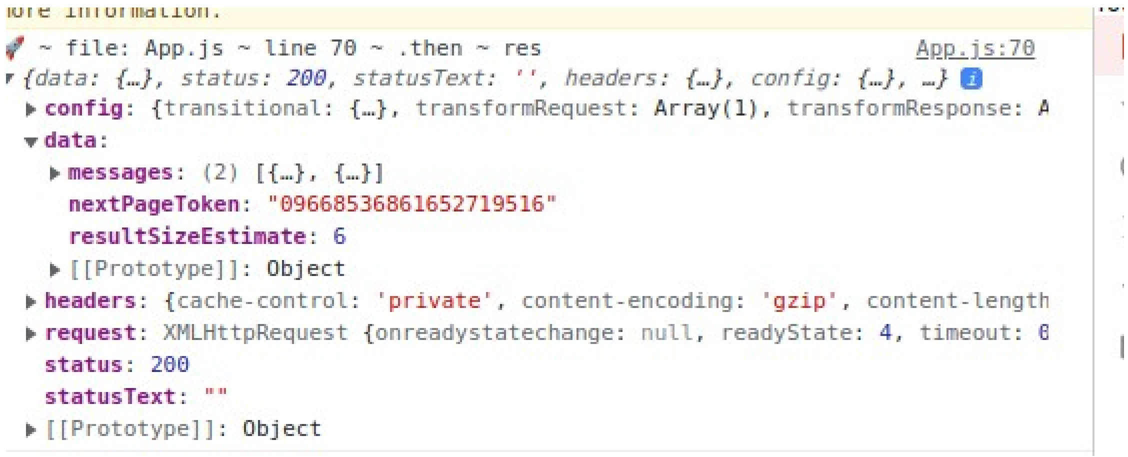
The listing is showing only two emails because it’s a dummy email and right now has less than 10 messages in the inbox. So while calling the API, I have added the query of the maximum result of 2 only. At the right top, you can see < and > for pagination. The challenge here was that GMAIL API does not provide us with any kind of logic to add pagination. I search a lot on this. When we call the API, then it sends us the list of IDs and tokens for the next page. Like here I have displayed two emails. When I call the API for these two email IDs, it sends me a next page token to get the next email IDs. When I will call that next page token, then it will give me the next page token but will not give me the token of the previous page. One of the main challenges here is to keep the record of tokens here.



Google <no-reply@accounts.google.com> **Security alert** - Google APIs Explorer was granted access to your ... Wed, 27 Jul 2022 07:59:32 GMT

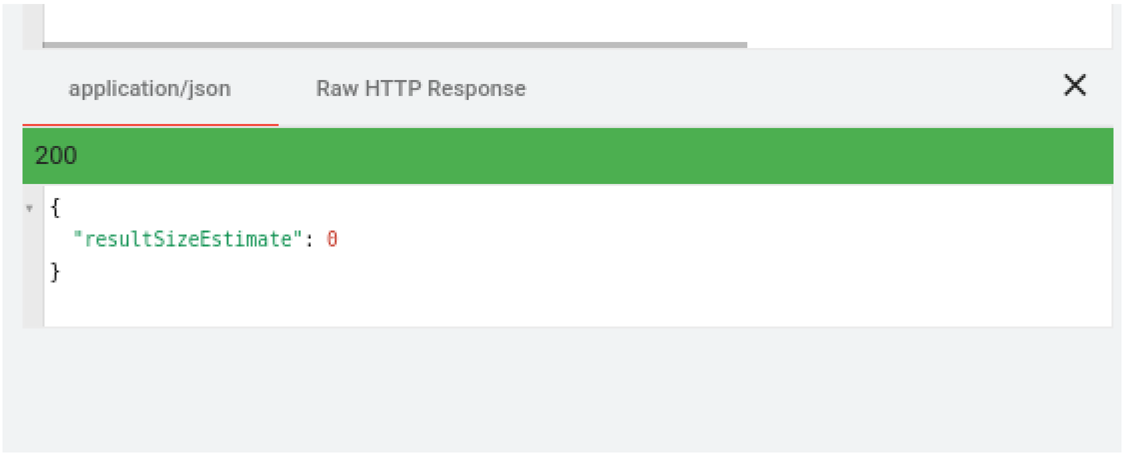
Sohaib Butt <sohaibbutt448506@gmail.com> dssds - ffddfd Tue, 26 Jul 2022 12:53:53 +0500

The reference picture for next PageToken is shown below:



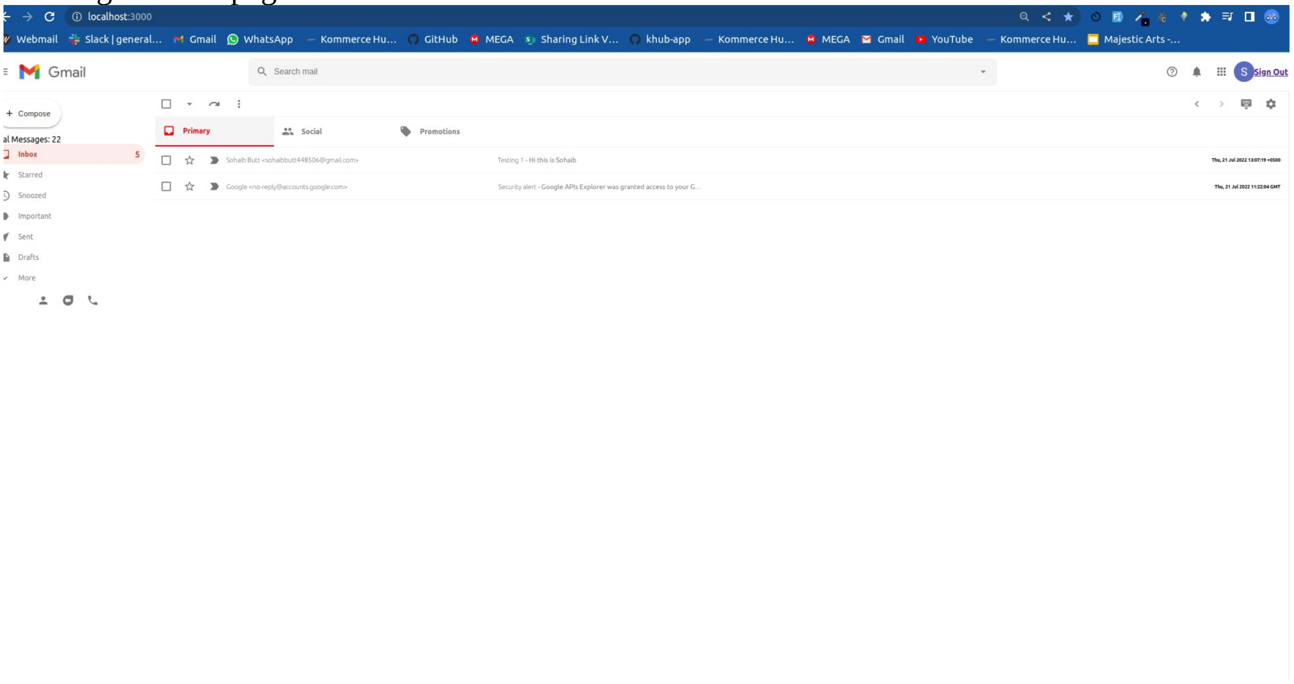
```
🚀 ~ file: App.js ~ line 70 ~ .then ~ res                          App.js:70
▾ {data: {…}, status: 200, statusText: '', headers: {…}, config: {…}, …} i
  ▸ config: {transitional: {…}, transformRequest: Array(1), transformResponse: A
  ▾ data:
    ▸ messages: (2) [{…}, {…}]
      nextPageToken: "09668536861652719516"
      resultSizeEstimate: 6
    ▸ [[Prototype]]: Object
  ▸ headers: {cache-control: 'private', content-encoding: 'gzip', content-length
  ▸ request: XMLHttpRequest {onreadystatechange: null, readyState: 4, timeout: 0
    status: 200
    statusText: ""
  ▸ [[Prototype]]: Object
```

To manually make the logic, I take the total messages in the inbox by calling the API. Like I have a list of 6 messages. [m1,m2,m3,m4,m5,m6].The API call tells me that I have the 6 messages. At first, I loaded 2 messages [m1,m2] and give me the Token of the next Page (t1) through which I can get the next messages. I save that token in an array and loaded the result (2 messages loaded till now). Then I click on my next Page and run the query to get the result of the next messages[m3,m4],the condition check the loaded messages is less than the total messages of inbox, so the result came and a token (t2) for [m5,m6]and result loaded now is 4. I save the t1 for [m3,m4] and t2 for[m5,m6] and the result loaded is 4.I click the next button again, condition check that loaded messages is less than total messages, so API call and give me messages and a token(wait for a token for what). Yes, A token t3 which I will run and give me that you have zero results remaining. A glimpse of this is below,



```
200
{
  "resultSizeEstimate": 0
}
```

So this means I have to stop clicking here when there is a loaded result that will come and become equal to total messages. So I change my condition here like I added 2 manual conditions to check loaded result+2 and take the difference to check in advance the options to disable the next page icon and to not add the next page token in the array. The next going logic works fine. The below picture showing the next page icon is disabled as there is no further result to fetch.



al Messages: 22

Sohaib Butt <sohaibbutt448506@gmail.com> Testing 1 - Hi this is Sohaib Thu, 21 Jul 2022 13:07:19 +0500

Google <no-reply@accounts.google.com> Security alert - Google APIs Explorer was granted access to your G... Thu, 21 Jul 2022 11:22:04 GMT

I have the record of[t1,t2] and loaded result of 6 messages.
t1 for [m3,m4]
t2 for [m5,m6]
Loaded Result=6
Now the time to move back!
First notice we do not have any token for [m1,m2]. We have to manually run that logic again for 1st two pages. But lets see.

Click on the previous page icon.
Here check the condition(token array has two tokens). I pop up the last token t2 from the array and run the API call for displaying messages of [m3,m4], now result loaded is 4(subtracted 2 results).Again click the previous page icon(token array has one token, condition verified), will pop up the token t1 and display the result of [m3,m4] and now result loaded. Now again user clicks on the previous page, the token array is empty then make the code like that when the token array is zero then run the code to get the messages of the 1stpage, and the result loaded now is 2.

The next and backward page code works fine. But there is a problem with this logic,suppose first-time pages loaded, displaying 2 messages[m1,m2] and a token for[m3,m4]. You click on the next page and get the result of[m3,m4] and the next page token.
At this spot you have only, [t1] saved in the array for the messages[m3,m4] and the result loaded is 4 if you now user clicks on the previous button then you have to run the logic of Array length is equal to zero but your code will not do. Here logic will not work. If you will do it right from here and then it will not work fine at the end of the total messages. The only flow that is workable depending upon the response we are getting is only to move forward and backward till the end without interpreting this.

3. Specific Email message

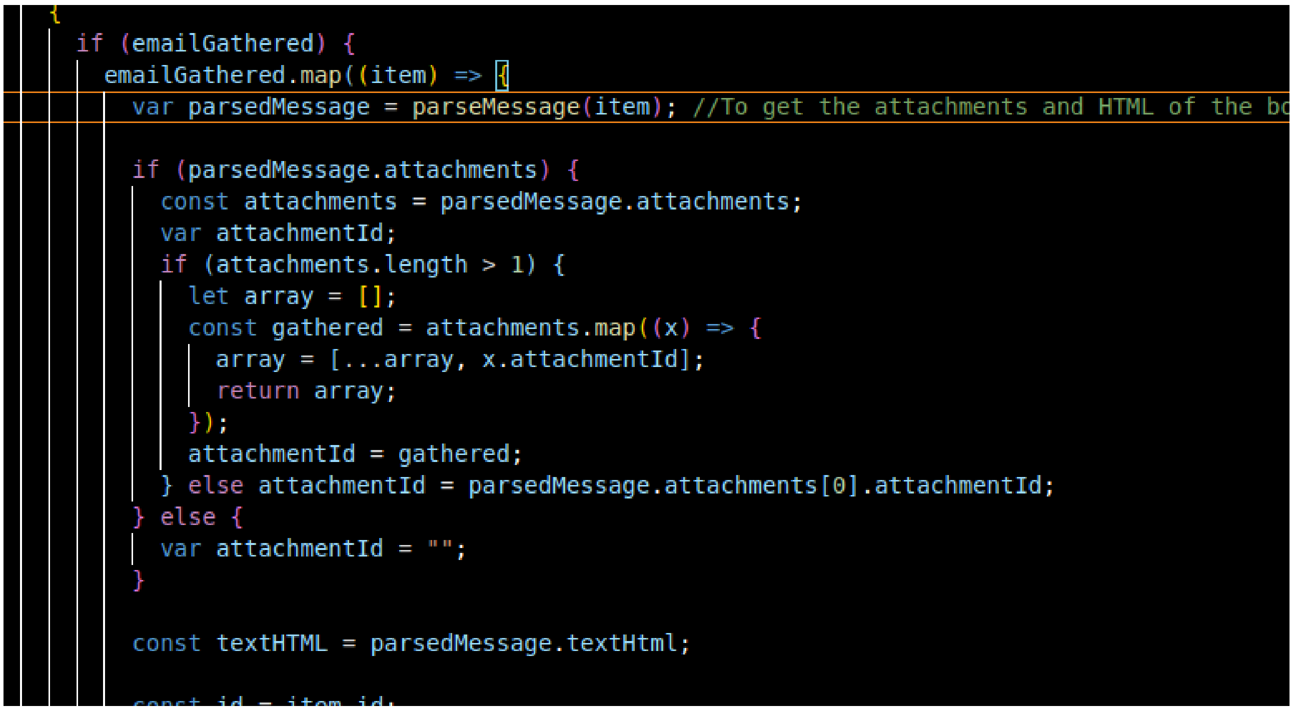
a. Fetch a particular Email and display

Challenge and Planning:

The messages listing is showing. In email we sometime have plain text, sometimes have html or attachments etc. The challenge was here to re structure the data.

Solution:

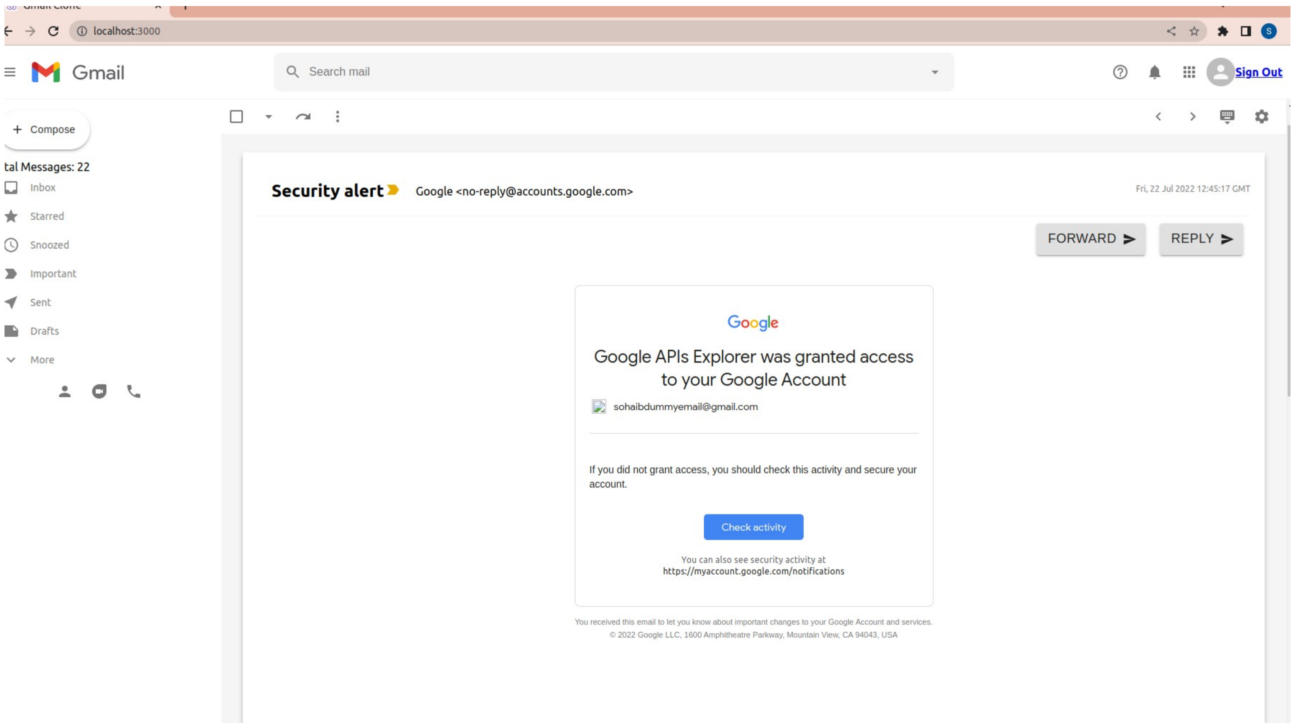
I have use a npm package of “gmail-api-parse-message” to parse the response from the GMAIL API’s response.
From this package, I have extracted the attachments ID and HTML if they have. A glimpse of the code is below.



```
{
  if (emailGathered) {
    emailGathered.map((item) => {
      var parsedMessage = parseMessage(item); //To get the attachments and HTML of the bo

      if (parsedMessage.attachments) {
        const attachments = parsedMessage.attachments;
        var attachmentId;
        if (attachments.length > 1) {
          let array = [];
          const gathered = attachments.map((x) => {
            array = [...array, x.attachmentId];
            return array;
          });
          attachmentId = gathered;
        } else attachmentId = parsedMessage.attachments[0].attachmentId;
      } else {
        var attachmentId = "";
      }

      const textHTML = parsedMessage.textHtml;

      const id = item.id;
```

Then display the attachments ID and HTML they have in the email body along with the email, time etc. A picture of a email is attached.

Output:



Security alert Google <no-reply@accounts.google.com> Fri, 22 Jul 2022 12:45:17 GMT

Google

Google APIs Explorer was granted access to your Google Account

sohaibdummyemail@gmail.com

If you did not grant access, you should check this activity and secure your account.

You can also see security activity at https://myaccount.google.com/notifications

You received this email to let you know about important changes to your Google Account and services.
© 2022 Google LLC, 1600 Amphitheatre Parkway, Mountain View, CA 94043, USA

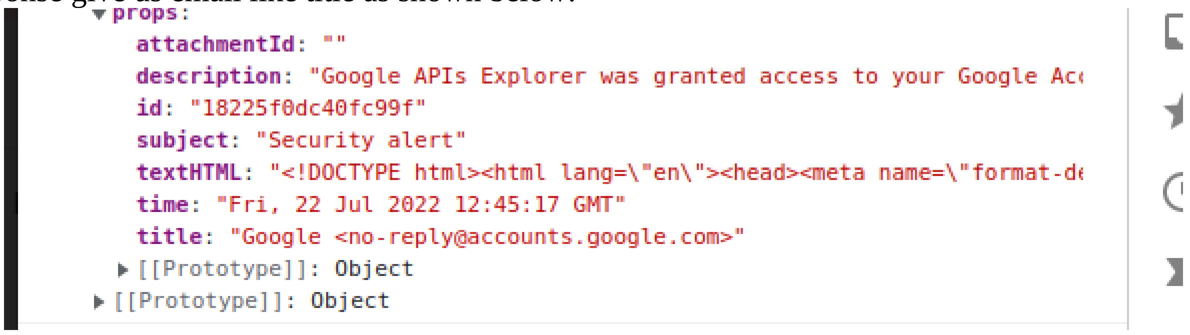
Task 4 and 5. Reply to Email Message and Forward that

In above displaying , you can see that there are two options of Forward and Reply. When you will click on the reply you have to enter the message content to send reply and when you will click on the forward, then you will have to tell the email of forward message person.

You have the option to send the attachments along with that.

Challenge:

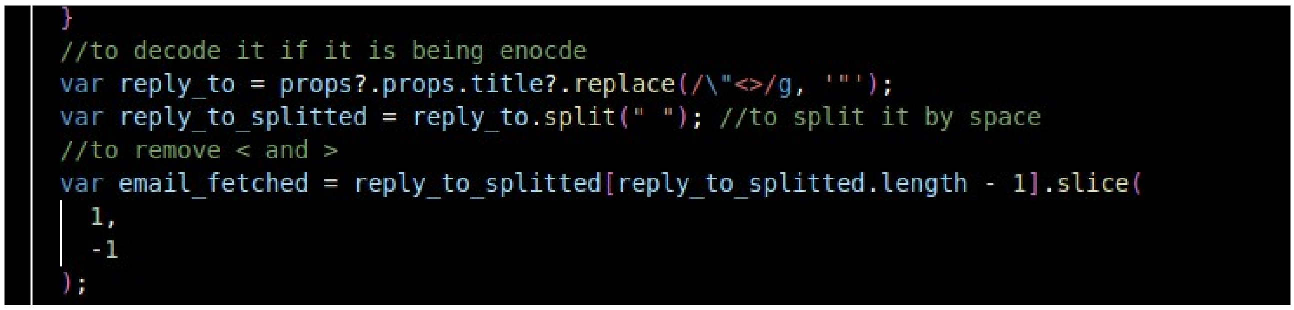
The challenge in sending the reply was to fetch the email whom have to reply. The gmail api response give us email like title as shown below:



```
▼props:
    attachmentId: ""
    description: "Google APIs Explorer was granted access to your Google Acc
    id: "18225f0dc40fc99f"
    subject: "Security alert"
    textHTML: "<!DOCTYPE html><html lang=\"en\"><head><meta name=\"format-de
    time: "Fri, 22 Jul 2022 12:45:17 GMT"
    title: "Google <no-reply@accounts.google.com>"
  ▶[[Prototype]]: Object
▶[[Prototype]]: Object
```

Solution:

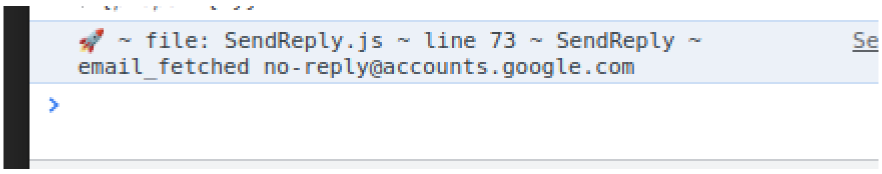
So to extract the email from that. I have done algorithmic approach on it. A glimpse of that approach is shown below:



```
}
//to decode it if it is being enocde
var reply_to = props?.props.title?.replace(/\"<>/g, '"');
var reply_to_splitted = reply_to.split(" "); //to split it by space
//to remove < and >
var email_fetched = reply_to_splitted[reply_to_splitted.length - 1].slice(
  1,
  -1
);
```

Output:

This algorithm will give us the email as required:

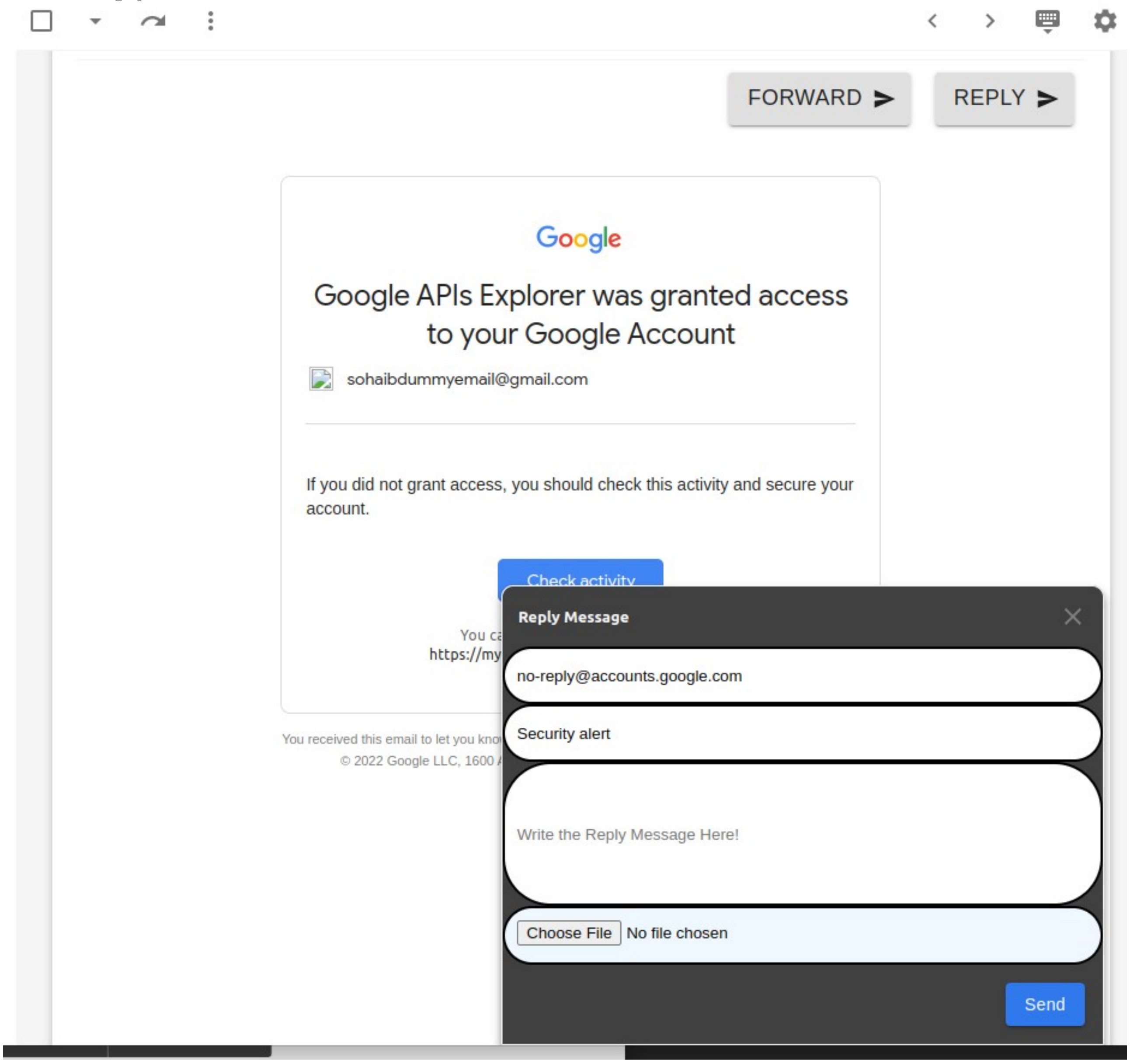


```
🚀 ~ file: SendReply.js ~ line 73 ~ SendReply ~                    Se
email_fetched no-reply@accounts.google.com
>
```

So final display when you will click the reply button will be like this,

The email,subject and message is required. The email and subject are fetched from the email you clicked on and when you will send the message, upon message sending API is successful, it will give you confirmation by giving a alert.

For Forwarding the message, the subject and message is fetched from the message which you forward and you have to type the email whom you want to forward. You can add attachments if you want in reply and forward both.



Google APIs Explorer was granted access to your Google Account

sohaibdummyemail@gmail.com

If you did not grant access, you should check this activity and secure your account.

You received this email to let you kno

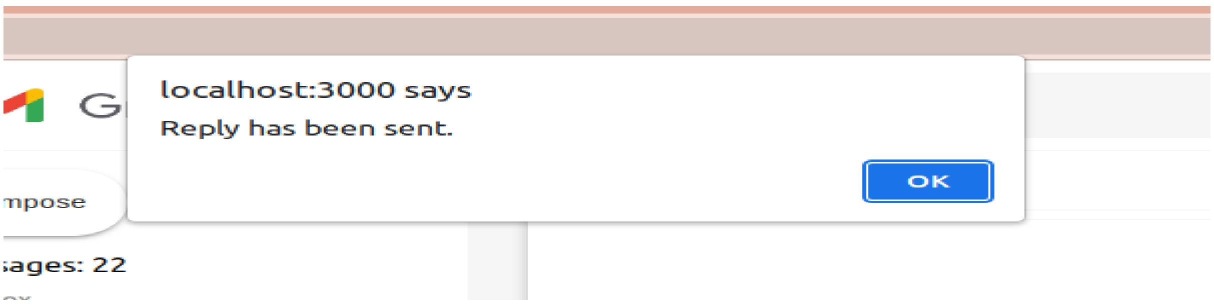
© 2022 Google LLC, 1600

Reply Message

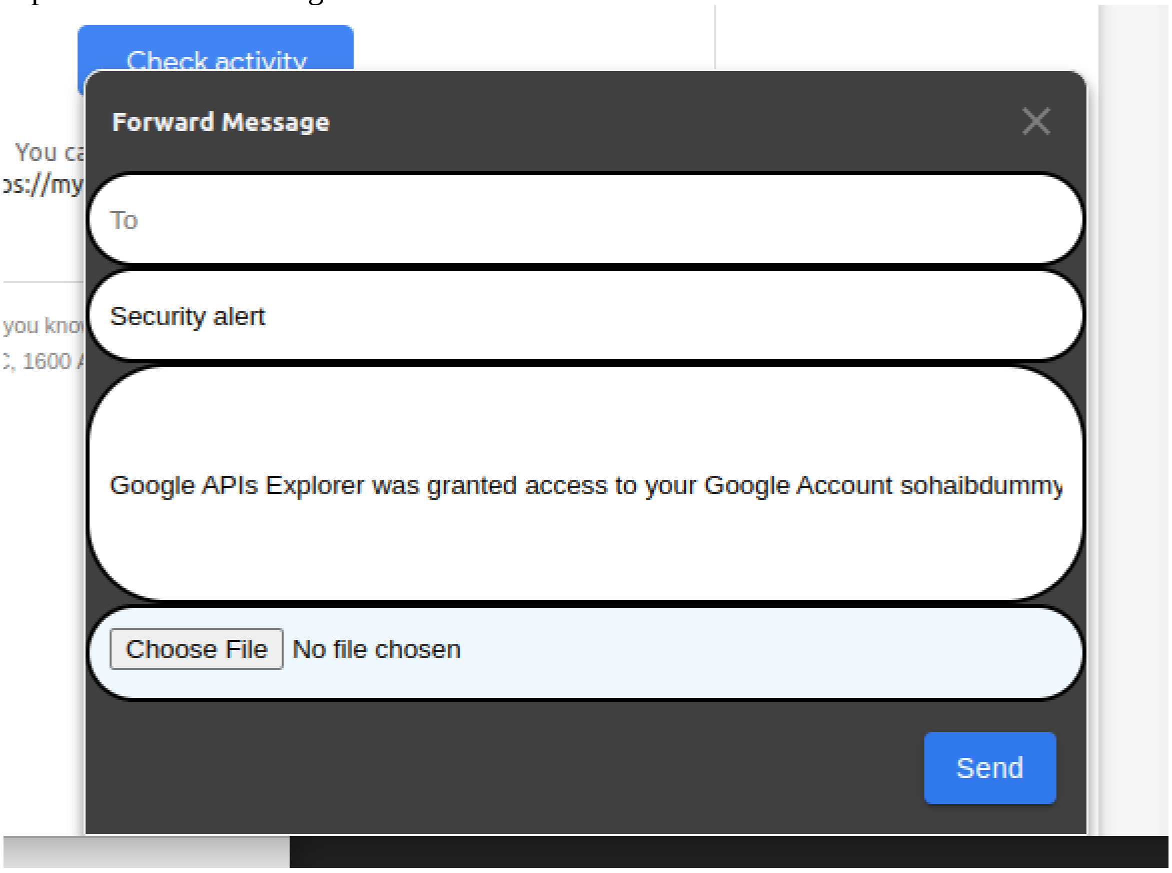
no-reply@accounts.google.com

Security alert

Write the Reply Message Here!


localhost:3000 says
Reply has been sent.

A glimpse of forward Message is shown below:

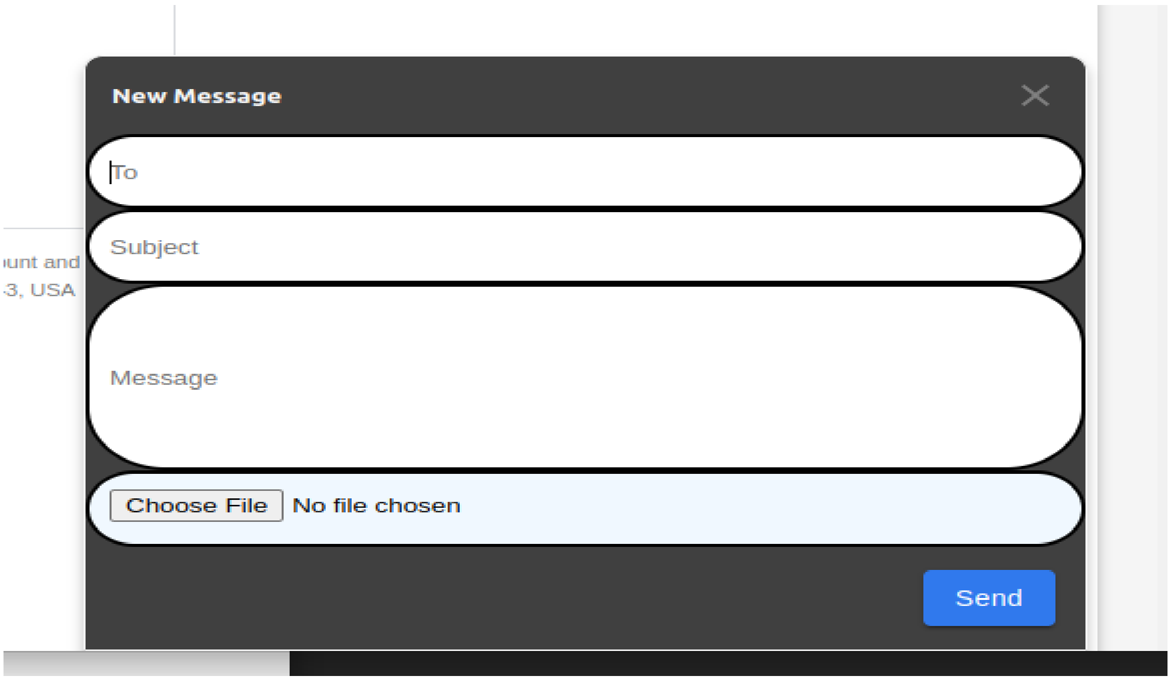

Forward Message

To

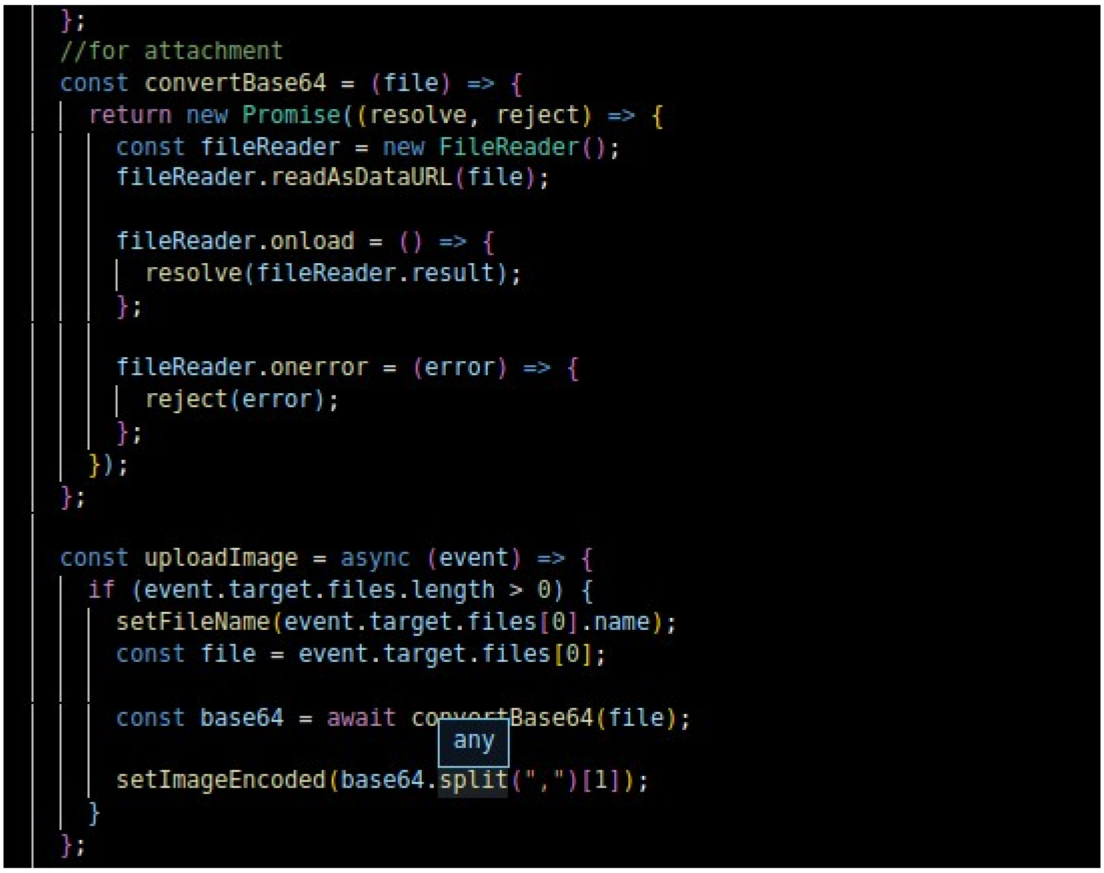
Security alert

Google APIs Explorer was granted access to your Google Account sohaibdummy

Task 6: Create a new Message:
When user will click on compose a message then it will show a component as shown below.

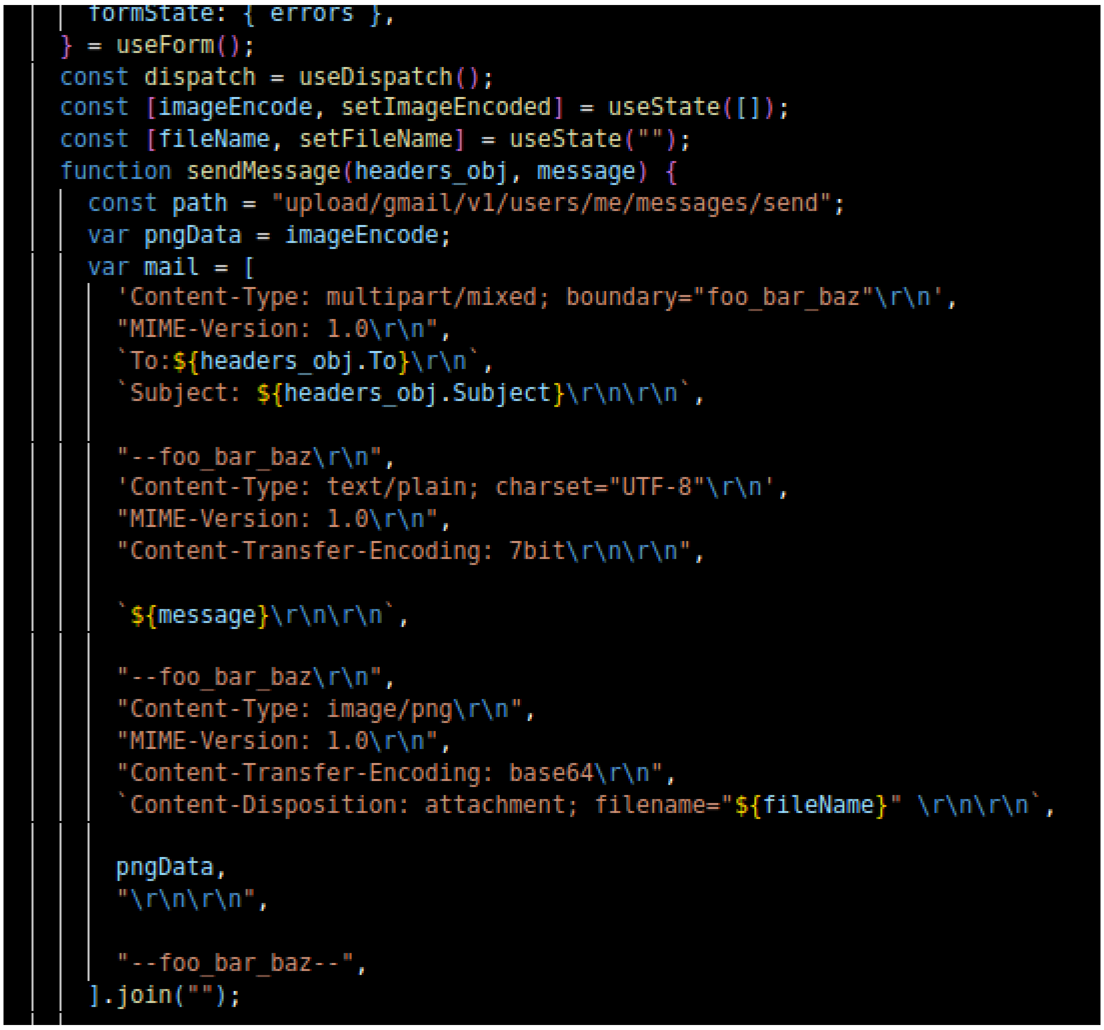


Challenge:
The challenge here was to manipulate the data in such a way as to send it through GMAIL API. First, without attachment, I encoded the data with btoa(base64 encoder for string). The challenge was the lack of documentation on structuring the encoded string.
Solution:
Read the documentation, check the samples for python and Stack Overflow, and then able to make the structure of sending the ended data through Gmail API.
Challenge:
The next challenge was to send an attachment. Again lack of documentation for structuring the object that we will encode and send.
Solution:Read the documentation, do some hit and trial of the encoded string,check the post request of the original email, read the documentation,stack overflow issues, try the different suggestions of solutions given, and then finally did it.
For Encoding Attachment:



```
};
//for attachment
const convertBase64 = (file) => {
  return new Promise((resolve, reject) => {
    const fileReader = new FileReader();
    fileReader.readAsDataURL(file);

    fileReader.onload = () => {
      resolve(fileReader.result);
    };

    fileReader.onerror = (error) => {
      reject(error);
    };
  });
};

const uploadImage = async (event) => {
  if (event.target.files.length > 0) {
    setFileName(event.target.files[0].name);
    const file = event.target.files[0];

    const base64 = await convertBase64(file);
                         any
    setImageEncoded(base64.split(",")[1]);
  }
};
```

So final encoded object function will looks like below.



```
    formState: { errors },
  } = useForm();
  const dispatch = useDispatch();
  const [imageEncode, setImageEncoded] = useState([]);
  const [fileName, setFileName] = useState("");
  function sendMessage(headers_obj, message) {
    const path = "upload/gmail/v1/users/me/messages/send";
    var pngData = imageEncode;
    var mail = [
      'Content-Type: multipart/mixed; boundary="foo_bar_baz"\r\n',
      "MIME-Version: 1.0\r\n",
      `To:${headers_obj.To}\r\n`,
      `Subject: ${headers_obj.Subject}\r\n\r\n`,

      "--foo_bar_baz\r\n",
      'Content-Type: text/plain; charset="UTF-8"\r\n',
      "MIME-Version: 1.0\r\n",
      "Content-Transfer-Encoding: 7bit\r\n\r\n",

      `${message}\r\n\r\n`,

      "--foo_bar_baz\r\n",
      "Content-Type: image/png\r\n",
      "MIME-Version: 1.0\r\n",
      "Content-Transfer-Encoding: base64\r\n",
      `Content-Disposition: attachment; filename="${fileName}" \r\n\r\n`,

      pngData,
      "\r\n\r\n",

      "--foo_bar_baz--",
    ].join("");
```

Task 7. Message statuses should be maintained using Redux.

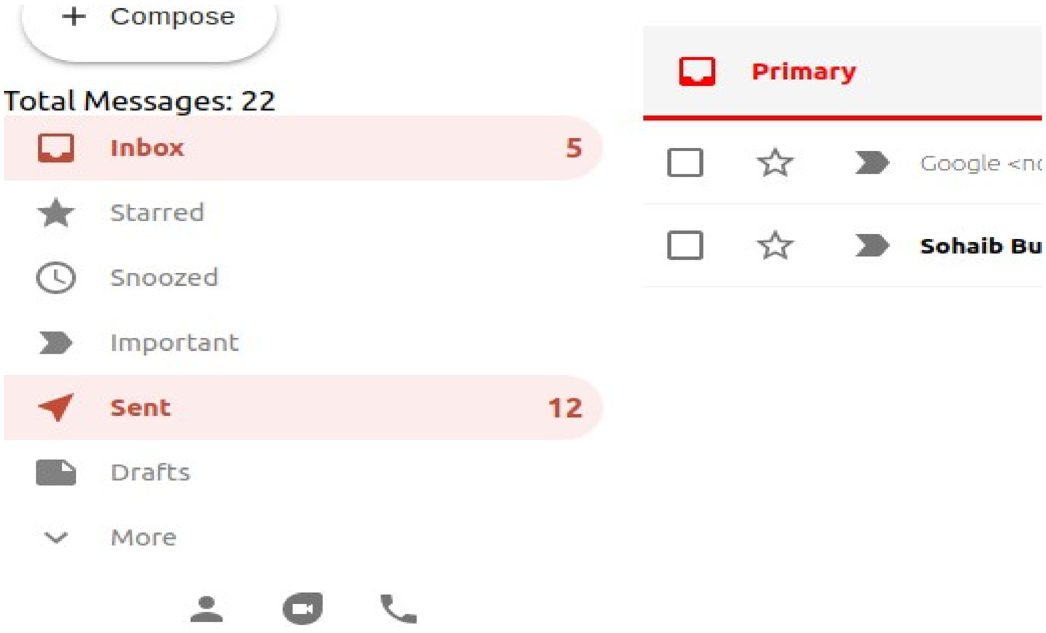
a. Total Messages

b. Unread Messages

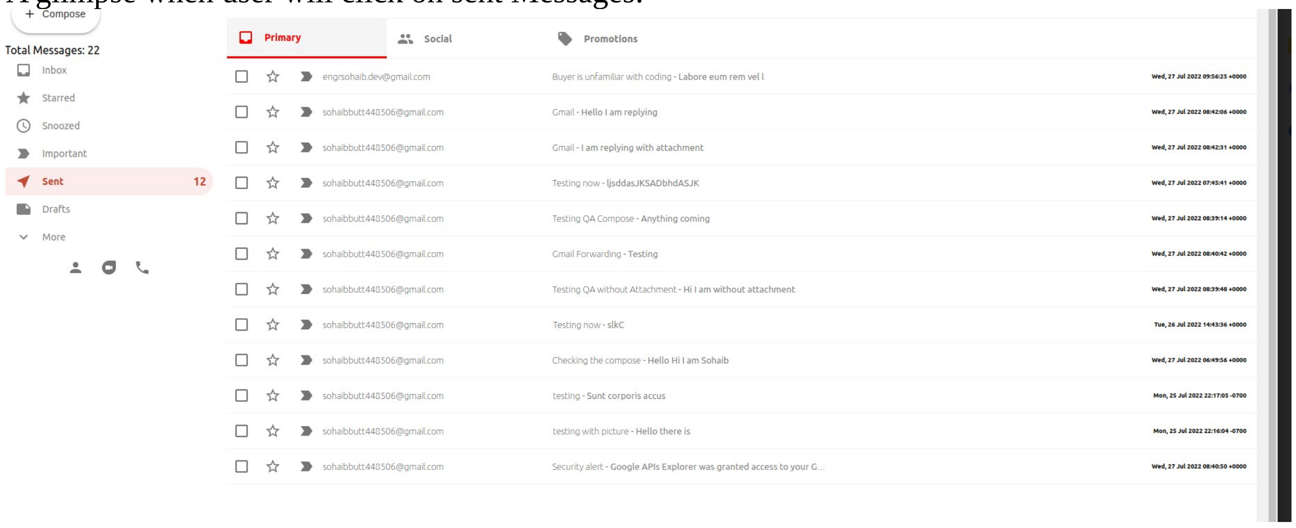
c. Sent Messages

Here the challenge was to get data on total messages, unread messages, and sent messages. I have called the API for all of that and stored the data in redux and then use that data to display the messages. Total messages display total messages again profile, sent messages show the total sent messages and The Inbox will show a number of that messages that are unread.

A glimpse of the messages is shown below.



A glimpse when user will click on sent Messages:



engrsohaib.dev@gmail.com Buyer is unfamiliar with coding - Labore eum rem vel l Wed, 27 Jul 2022 09:56:25 +0000
sohaibbutt448506@gmail.com Gmail - Hello I am replying Wed, 27 Jul 2022 08:42:06 +0000
sohaibbutt448506@gmail.com Gmail - I am replying with attachment Wed, 27 Jul 2022 08:42:31 +0000
sohaibbutt448506@gmail.com Testing now - ljsddasJKSADbhdASJK Wed, 27 Jul 2022 07:45:41 +0000
sohaibbutt448506@gmail.com Testing QA Compose - Anything coming Wed, 27 Jul 2022 08:39:14 +0000
sohaibbutt448506@gmail.com Gmail Forwarding - Testing Wed, 27 Jul 2022 08:40:42 +0000
sohaibbutt448506@gmail.com Testing QA without Attachment - Hi I am without attachment Wed, 27 Jul 2022 08:39:48 +0000
sohaibbutt448506@gmail.com Testing now - slkC Tue, 26 Jul 2022 14:43:36 +0000
sohaibbutt448506@gmail.com Checking the compose - Hello Hi I am Sohaib Wed, 27 Jul 2022 06:49:56 +0000
sohaibbutt448506@gmail.com testing - Sunt corporis accus Mon, 25 Jul 2022 22:17:05 -0700
sohaibbutt448506@gmail.com testing with picture - Hello there is Mon, 25 Jul 2022 22:16:04 -0700
sohaibbutt448506@gmail.com Security alert - Google APIs Explorer was granted access to your G... Wed, 27 Jul 2022 08:40:50 +0000

Redux Challenge:

First the listing of all emails are get through email and store them in redux and the inbox module always display the data that are placed in the redux. When user go to next page, the api call and response is again stored in redux and then data is being displayed based on the data is stored in redux. Throughout the app the data is being managed by redux. Like by default your inbox will be shown but when you will click on the sent, then action will dispatch to close down the inbox and open the component of sent emails.

Learning Outcome:

Some of the things that this test helps me in learning other than React structure and programming things are as:

- Understanding the principles of creating an effective web page, including an in-depth consideration of information architecture
- Develop skills in analyzing the usability of a website
- Understand how to plan and conduct user research
- Effectively Manage Website requirements using available resources
- Data Management throughout the application
- Debugging

GitHub link: *https://github.com/Sohaib448506/GMAIL-OAUTH*