Capstone-1 Project Report

Topic : Active Post Monitoring and Hate Post Detection over Internet using Browser Extensions.

Team Members :

- Anubhav Paul - U101116FCS097
- Mukul Sachdeva - U101116FCS072
- Piyush Singhania - U101116FCS282
- Rahul Poddar - U101116FCS097

Introduction

Our Capstone-1 Project was based on Active Post Monitoring and Hate Post Detection over the Internet. In this project we have built a browser extension that detects the emotions of the selected text on a webpage. The extension works on all active tabs and all urls. The browser extension also has an additional feature of retrieving the text selected as an alert.

Rationale of Work

The fast paced and fragmented online discussion is changing the world and not always for the better. Media is struggling with moderation demands and major news sites are closing down commenting on their articles, because they are being used to drive an unrelated political agenda, or just for trolling. Moderation practise cannot rely on humans anymore, because a single person can easily generate copious amounts of content, and moderation needs to be done with care. It’s simply much more time consuming than cut and pasting your hate or ads all across the internet. Anonymity adds to the problem, as it seems to bring out the worst in people.

Tools and Technologies Used

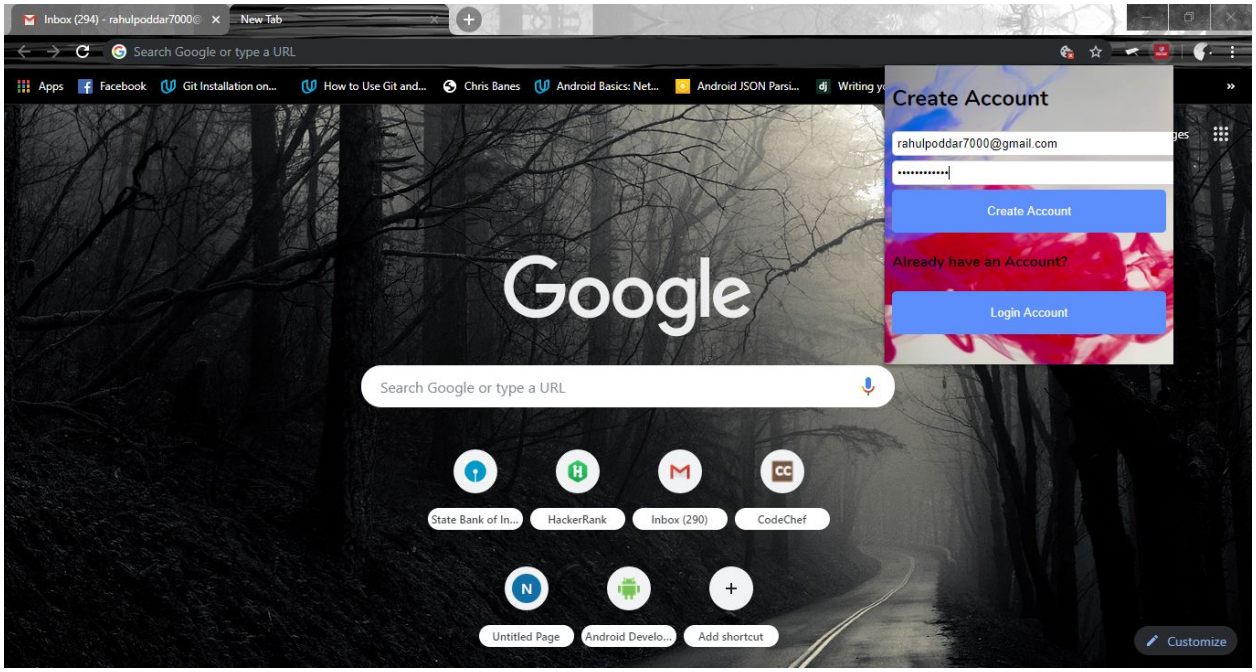
- **API**
  - **IBM Watson Tone Analyzer API** - An API provided by IBM Cloud that we used for detecting the tone of the selected text.
- **Programming Language**
  - **Javascript** - The entire logic of the code and implementation of the API was done in JS.
  - **HTML** - Used for creating the DOM elements of the browser extension.
  - **CSS** - Used for giving styles to the DOM elements created in the browser extension.
- **Tools**
  - **Webstorm/Atom/Visual Studio Code** - An IDE that we used for integrating git and easy handling of code throughout our project.
  - **Github** - A project management tool that helped us to keep track of the changes in the code and also manage code easily.
  - **Firebase** - A cloud database by Google that we used for authentication of users in the browser extension.
- **Build Tool**
  - **Chrome Developer Tools** - Used for creating the .crx version of the extension to be deployed in the Google Chrome browser.
- **Unit Testing Tool**
  - **Chrome Developer Tools** - Used for debugging and testing errors in the code that we encountered during the project.

Future Scope

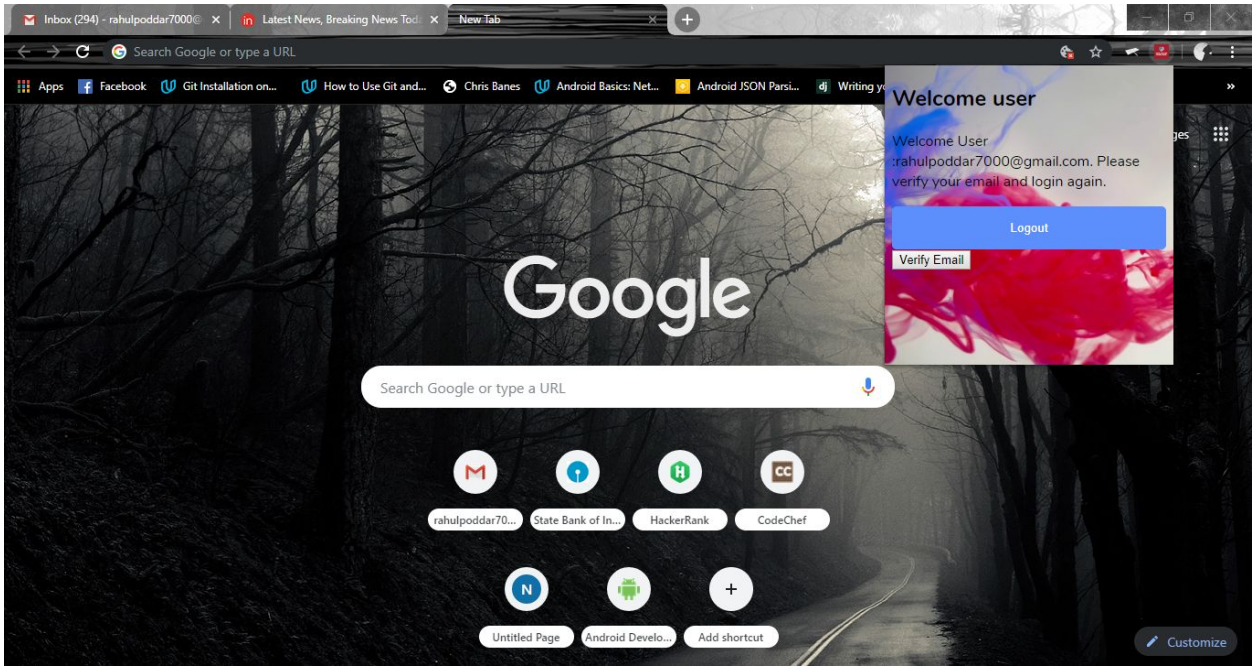
- Implementation of Tensorflow Toxicity Model.
- Active monitoring of text posted on the internet by the user (Since we were prohibited to use Keylogger) . Our efforts would be to design a better keylogger which filters out authentication details.
- The highlighting of text has not been enabled if in case it is found to be a hate speech.(We can just retrieve the text as for now).
- Highlight text with different levels of colour intensity for different levels of anger.
- The browser extension fires up automatically after the load of a website.
- As a future scope we can even store the texts user specifically to analyze the usage patterns of every user and can also give them suggestions as to what posts to refrain from reading/sharing over the social network or any other website.

Product Demo (Screenshots) :

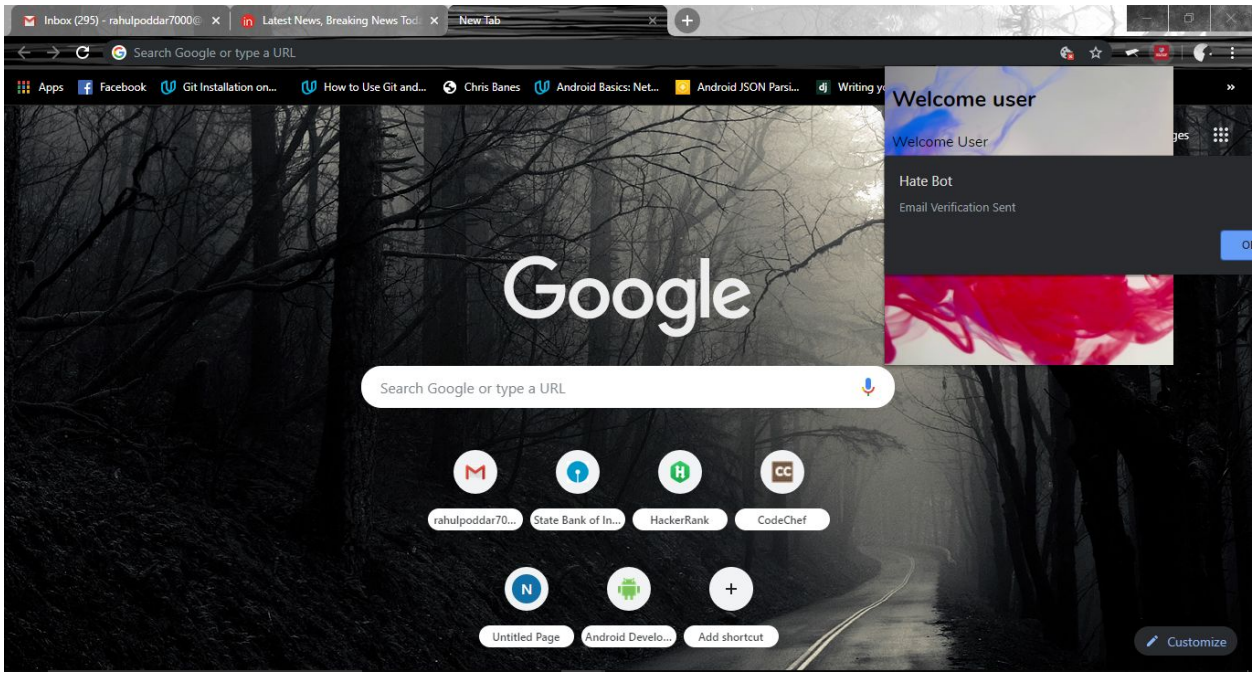
1. Create an account to authenticate as a ‘user’.
    - In this case user email id is rahulpoddar7000@gmail.com



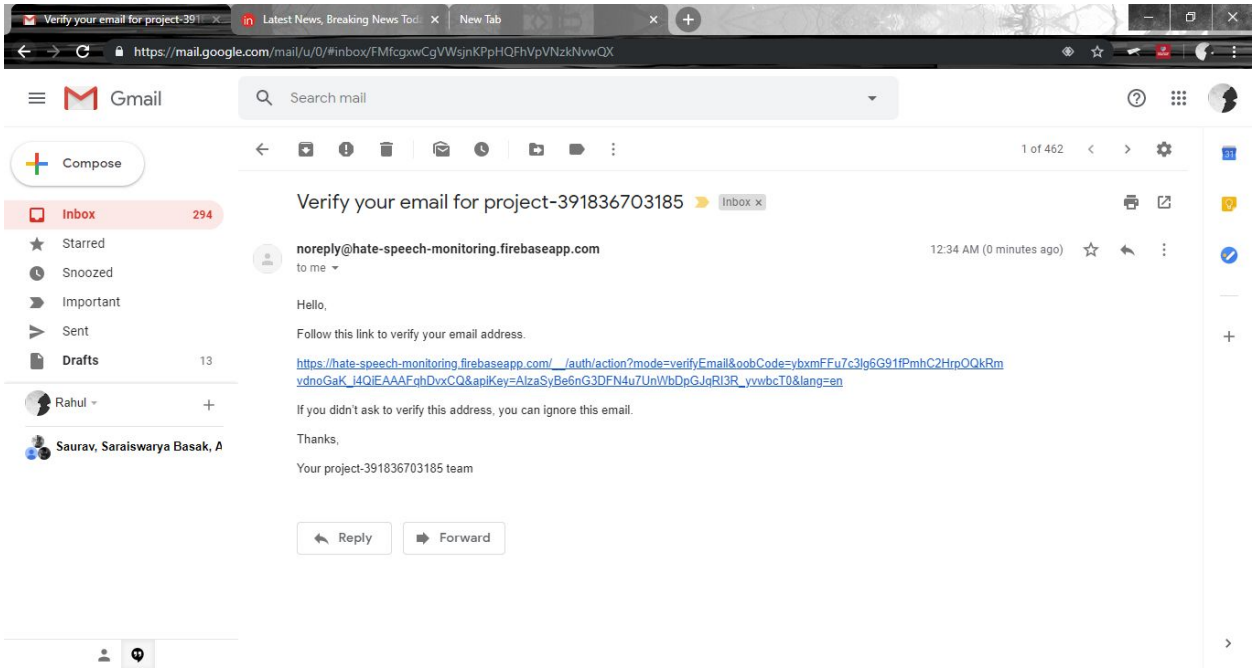
2. Account gets created however the user needs to verify via email verification link.



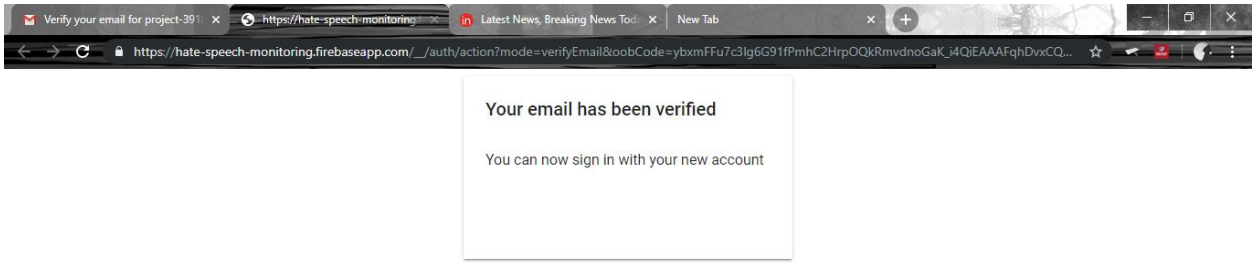
3. Verification email sent.



4. Click on the link to verify account.



5. Account verified.



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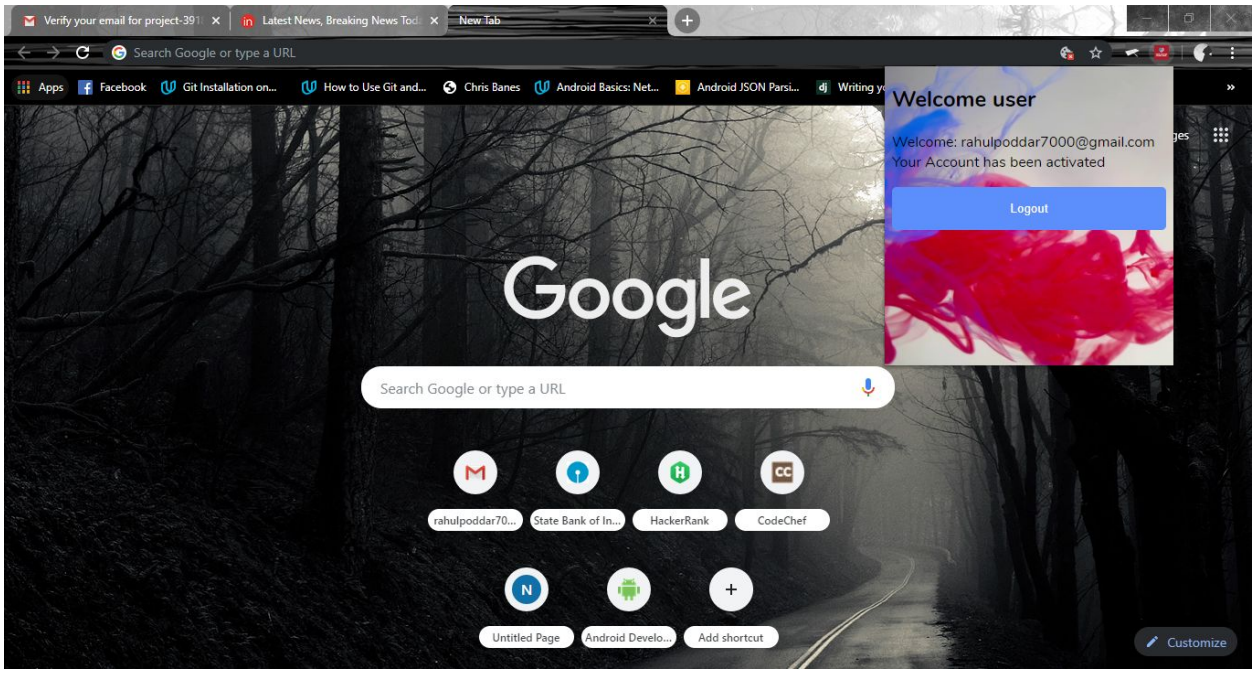
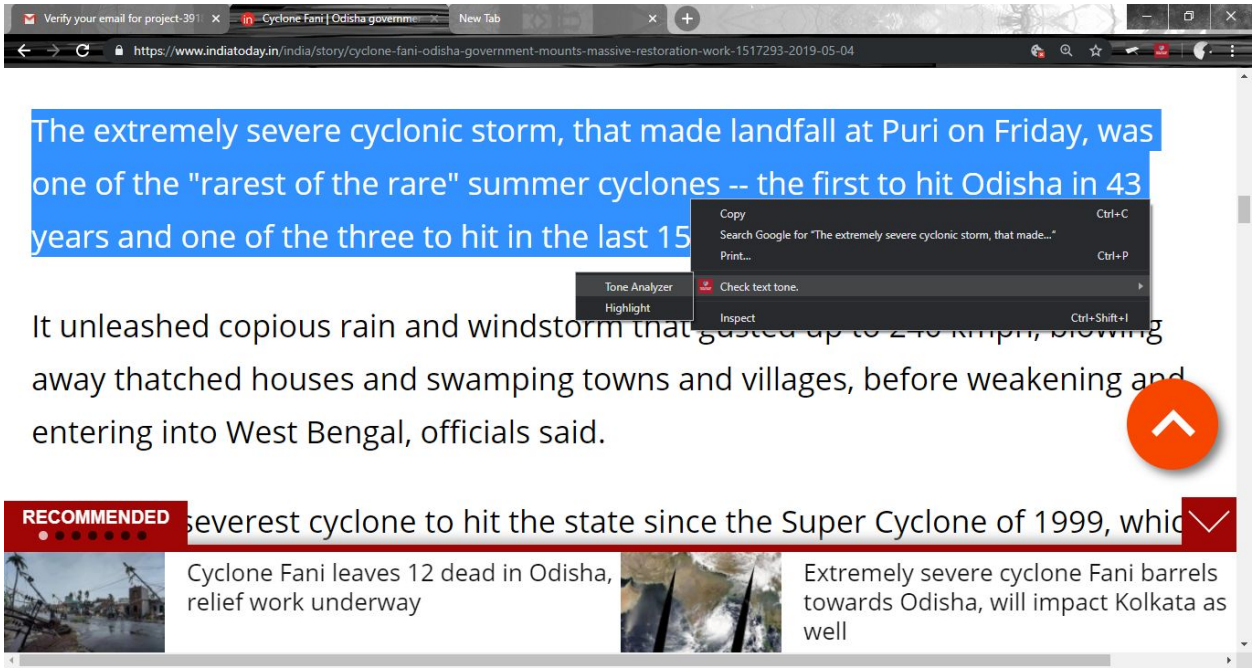
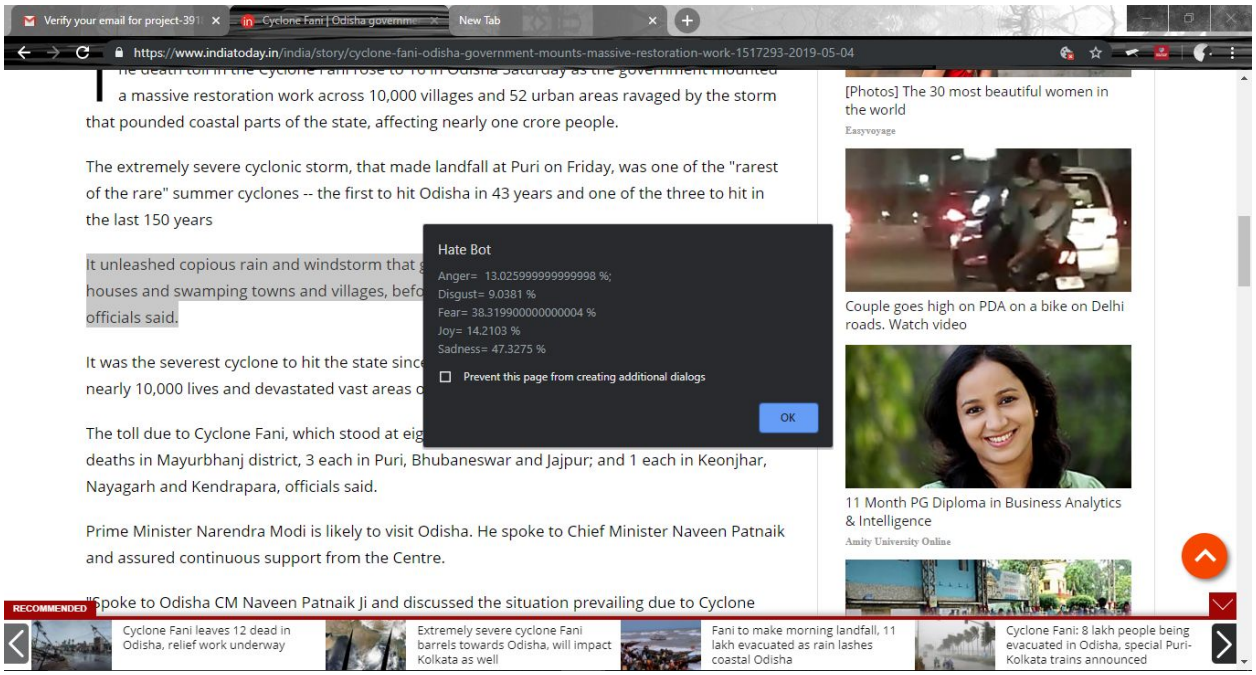
6. User: rahulpoddar7000@gmail.com is now a verified user in the browser extension database.



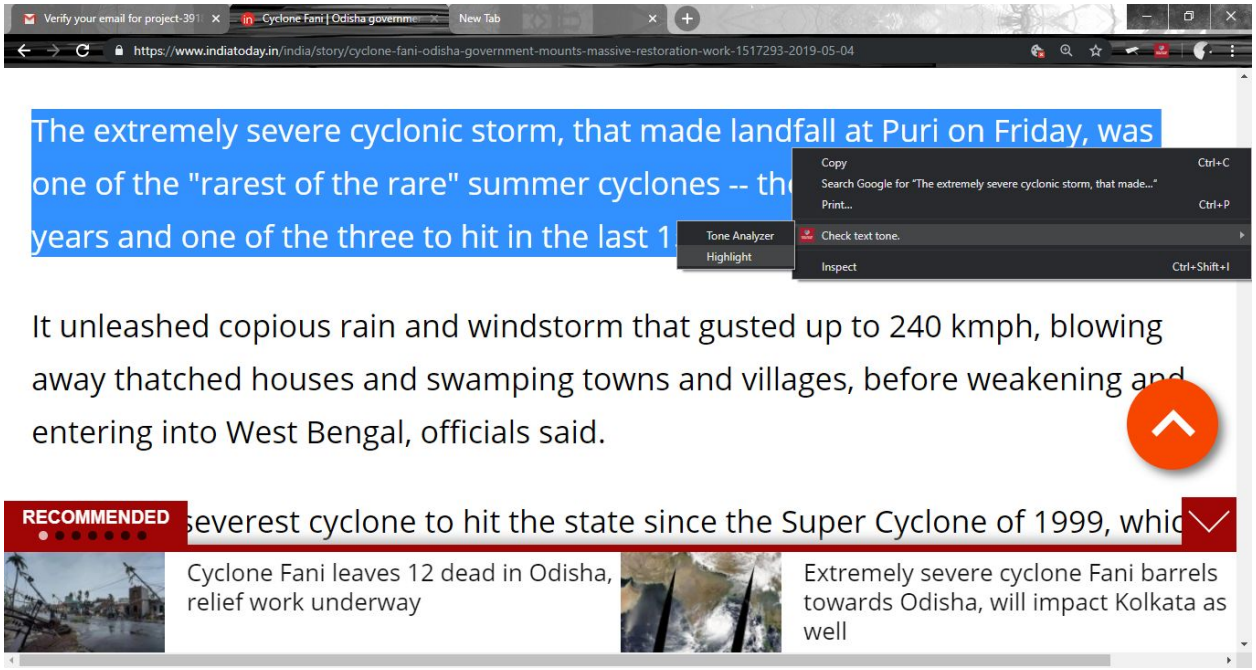
7. Right click on a selected portion of text, click on “check text tone” then click on “Tone Analyzer” to check it’s Emotion Index.



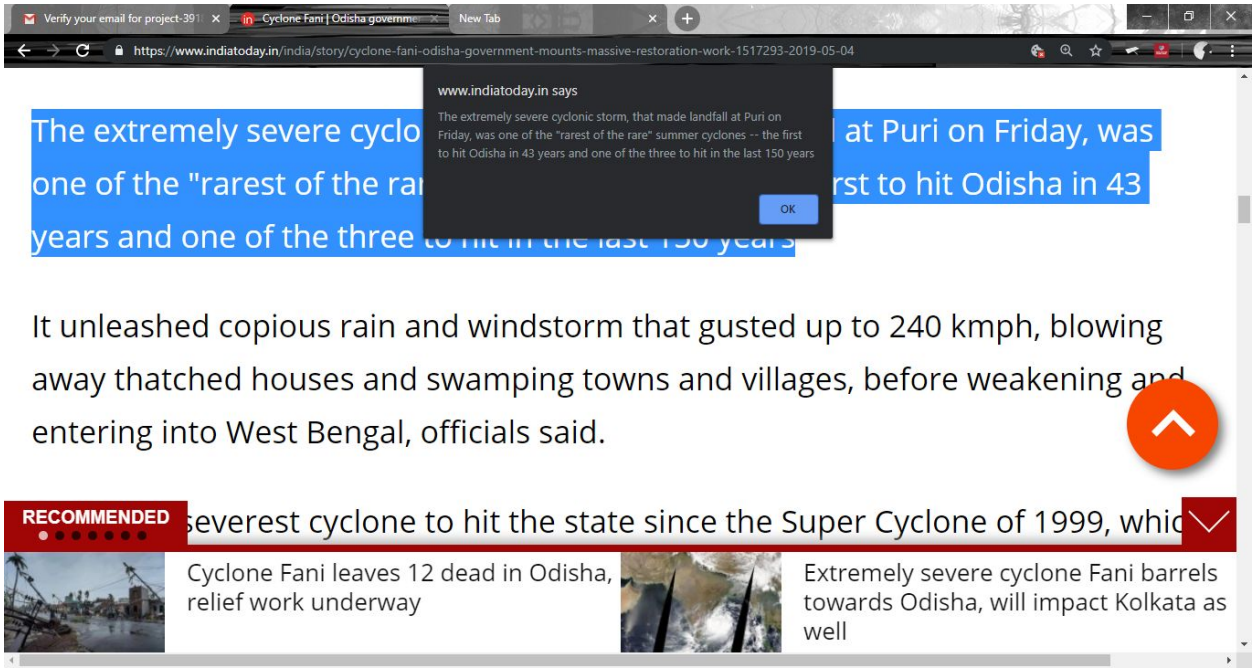
8. Pop-up showing the percentage indexes of associated emotion(s).



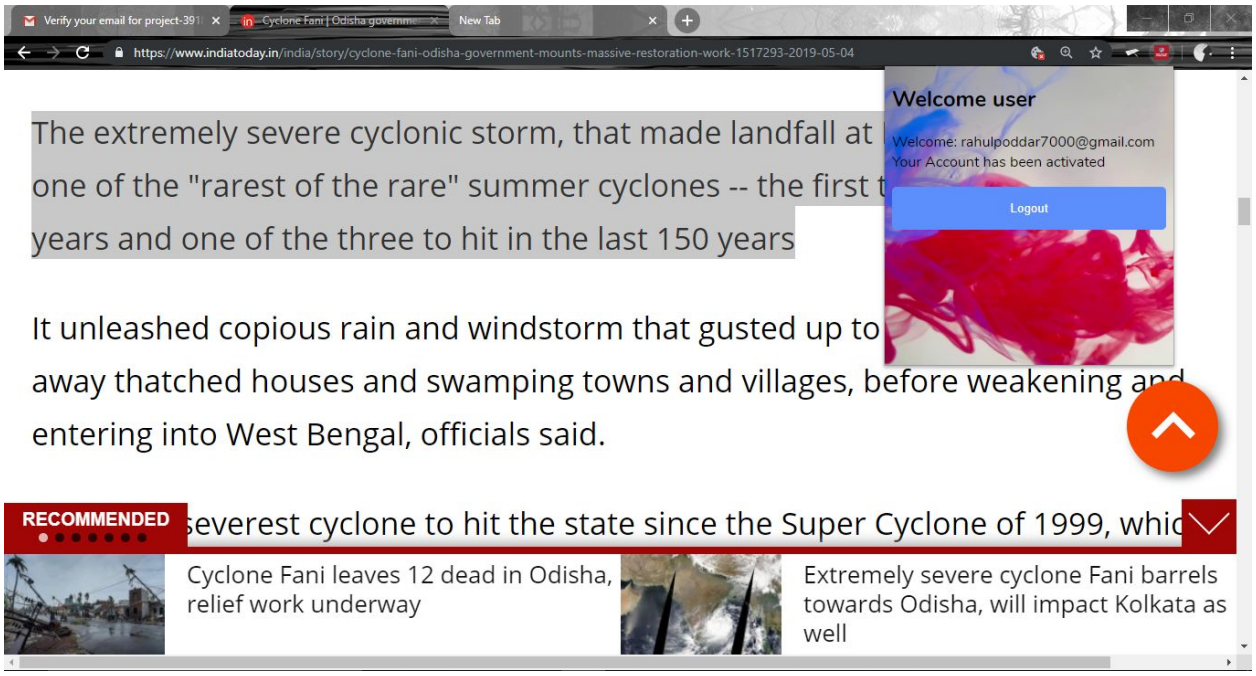
9. The option of “Highlight” holds a future scope in highlighting the text in accordance to the emotions associated to it. In this prototype we have implemented this option to show that we are able to retrieve the text from DOM elements.



10. The retrieved text is shown as an alert.



11. Finally the user can logout from his/her session when the use is completed.



Conclusion :

- We developed a browser extension that can capture selected text from active web pages in chrome browser and analyse is using IBM Watson Tone Analyzer to tell the percentages of different emotions in that selected text through an alert window.
- We also tried to highlight the text with different colors to represent different emotions but security algorithms of the browser didn't allow us to access the DOM of the webpage.
- We plan on implementing other Machine Learning and Artificial Intelligence models like Toxicity from TensorFlow besides IBM Watson Tone Analyser to capture the sentiment of selected text in near future.
- The extension is completely developed in HTML, CSS and JavaScript and no user data is being shared with any third party sources.

Capstone 2 Scope:

We would like to explore the other project topics before finalising this topic as a capstone 2 project.