



INFORMATION RETRIEVAL ASSIGNMENT 2

# PATIENT REPORT SUMMARIZER

DIVYA, 1MS18CS043, CSE 6A

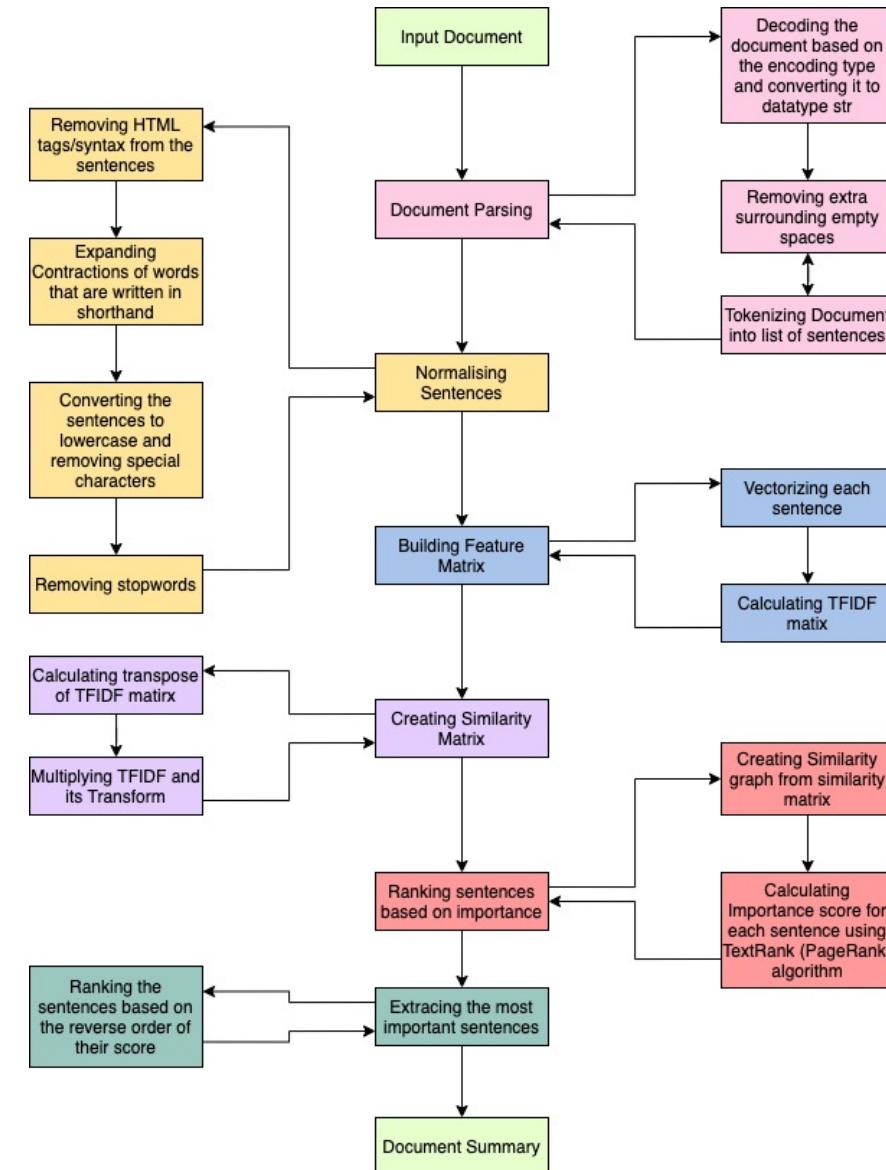
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# INTRODUCTION

Doctors generally spend a lot of time looking at old records to understand a patients health history which results in them not being able to pay more attention to treatment. they can use our model to search through a particular record fast and look at the summarised health history of a patient. They don't have to spend time going through each record. They can search and sort by various features like time period, symptoms, treatment etc and also get a summary of all records according to their choice.

Project Link : <https://github.com/Gaurav-71/Patient-Report-Summarizer>

# SYSTEM DESIGN



# SUMMARISER

This is a feature which lets the Doctor view at the summary of a report for a patient from the database instead of reading through the look report. The technique we are using for summarisation is an Extractive way of summarisation done using TextRank Algorithm. The steps used to implement the algorithm can be briefly described as -

1. Reading the text from the document and Parsing it to get rid of any unwanted characters.
2. Normalising the corpus to get Normalised sentences
3. Building a Feature Matrix of the normalised sentences - we are using the method based on "maximum common words" using TF IDF Vectorising
4. Creating a Similarity Matrix and then a Similarity graph from the Feature Matrix
5. Ranking the Sentences using PageRank Algorithm from the Similarity Matrix.
6. Taking out the most important (highly ranked) sentences from the document and creating the summary.

## UNIVERSAL SEARCH

Easily search for a Name / Symptom / Disease / Sentence or a certain Query.

This is a feature that names the doctor to search through the document based on a string which can be anything like a name, a symptom, disease, sentence or any other query. We are using Vector Space Model of ranking documents to implement the same.

## VIEW REPORTS BY DATE

We have a Date of Creation associated to each document saved in the database. The user/doctor can search for a Document/Report created between two dates or after a particular date or before a particular date as per his convenience.

## COMPREHENSIVE REPORT VIEW

If the doctor decides that he needs to go through the complete report of a patient, that is facilitated as well through our application.

## ALL IN ONE SOLUTION

This is the most important and practical feature of the application where the user can search for a medical report created between (after/before) two (one) dates based on a query and view the complete report or the summary of it.

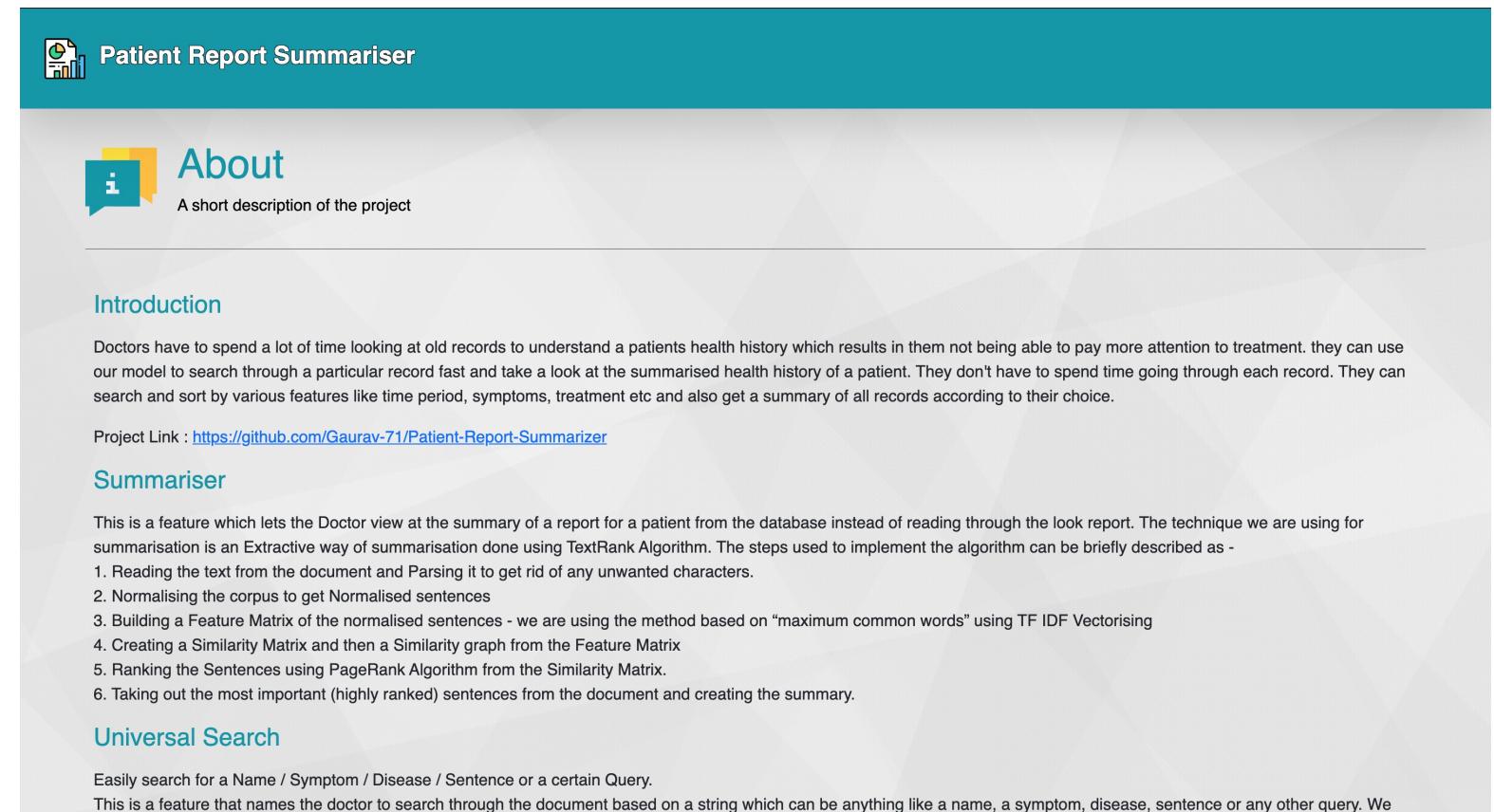
# SCREENSHOTS

The screenshot shows the 'Patient Report Summariser' dashboard. At the top, there is a logo consisting of a bar chart icon followed by the text 'Patient Report Summariser'. Below the logo, there is a user icon (a doctor with a stethoscope) and the word 'Dashboard'. A sub-instruction 'Select the most suitable information retrieval operation you want to perform on your reports' is displayed. The dashboard features three main cards:

- About**: An icon showing a teal speech bubble with a white 'i'. Below it, the text reads 'Get a quick description about the project'.
- Search & Summarise**: An icon showing a magnifying glass over a document. Below it, the text reads 'Get a gist of a patients report or search for a particular symptom'.
- Team**: An icon showing a person at a laptop with a speech bubble containing '</>'. Below it, the text reads 'View the details of the team behind this project'.

At the bottom left of the dashboard, the URL '127.0.0.1:5000/summarization' is visible.

# SCREENSHOTS



The screenshot shows a web-based application titled "Patient Report Summariser". The header features a teal bar with the project name and a small icon. Below the header, the word "About" is displayed in large blue letters next to a teal "i" icon. A sub-section titled "A short description of the project" follows. The main content area includes sections for "Introduction", "Summariser", and "Universal Search".

**Patient Report Summariser**

**About**  
A short description of the project

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**Introduction**

Doctors have to spend a lot of time looking at old records to understand a patients health history which results in them not being able to pay more attention to treatment. they can use our model to search through a particular record fast and take a look at the summarised health history of a patient. They don't have to spend time going through each record. They can search and sort by various features like time period, symptoms, treatment etc and also get a summary of all records according to their choice.

Project Link : <https://github.com/Gaurav-71/Patient-Report-Summarizer>

**Summariser**

This is a feature which lets the Doctor view at the summary of a report for a patient from the database instead of reading through the look report. The technique we are using for summarisation is an Extractive way of summarisation done using TextRank Algorithm. The steps used to implement the algorithm can be briefly described as -

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**Universal Search**

Easily search for a Name / Symptom / Disease / Sentence or a certain Query.  
This is a feature that names the doctor to search through the document based on a string which can be anything like a name, a symptom, disease, sentence or any other query. We

# SCREENSHOTS

The screenshot shows the 'Patient Report Summariser' application. At the top, there is a teal header bar with the title 'Patient Report Summariser' and a small icon of a document with a chart. Below the header is a light gray search area containing a magnifying glass icon and the text 'Search & Summarise'. Underneath this, a sub-header reads 'Get a gist of the patient's report or easily find a patient with a particular symptom'. The main content area features a table with patient data. The table has a teal header row with columns for 'Patient Name', 'Report Date', and 'Actions'. The 'Actions' column contains two buttons each: 'View' (gray) and 'Summarize' (teal). The table rows list seven patients with their names and report dates:

Patient Name	Report Date	Actions
Jennifer Winged	1995-08-25	<button>View</button> <button>Summarize</button>
Wendy Byrde	1996-02-21	<button>View</button> <button>Summarize</button>
Navarro Del Rio	1996-03-13	<button>View</button> <button>Summarize</button>
Wyatt Langmore	1997-02-16	<button>View</button> <button>Summarize</button>
Scarlet Johanson	1999-01-02	<button>View</button> <button>Summarize</button>
Chandler Bing	1999-08-02	<button>View</button> <button>Summarize</button>
Jesse Pinkman	2000-04-20	<button>View</button> <button>Summarize</button>

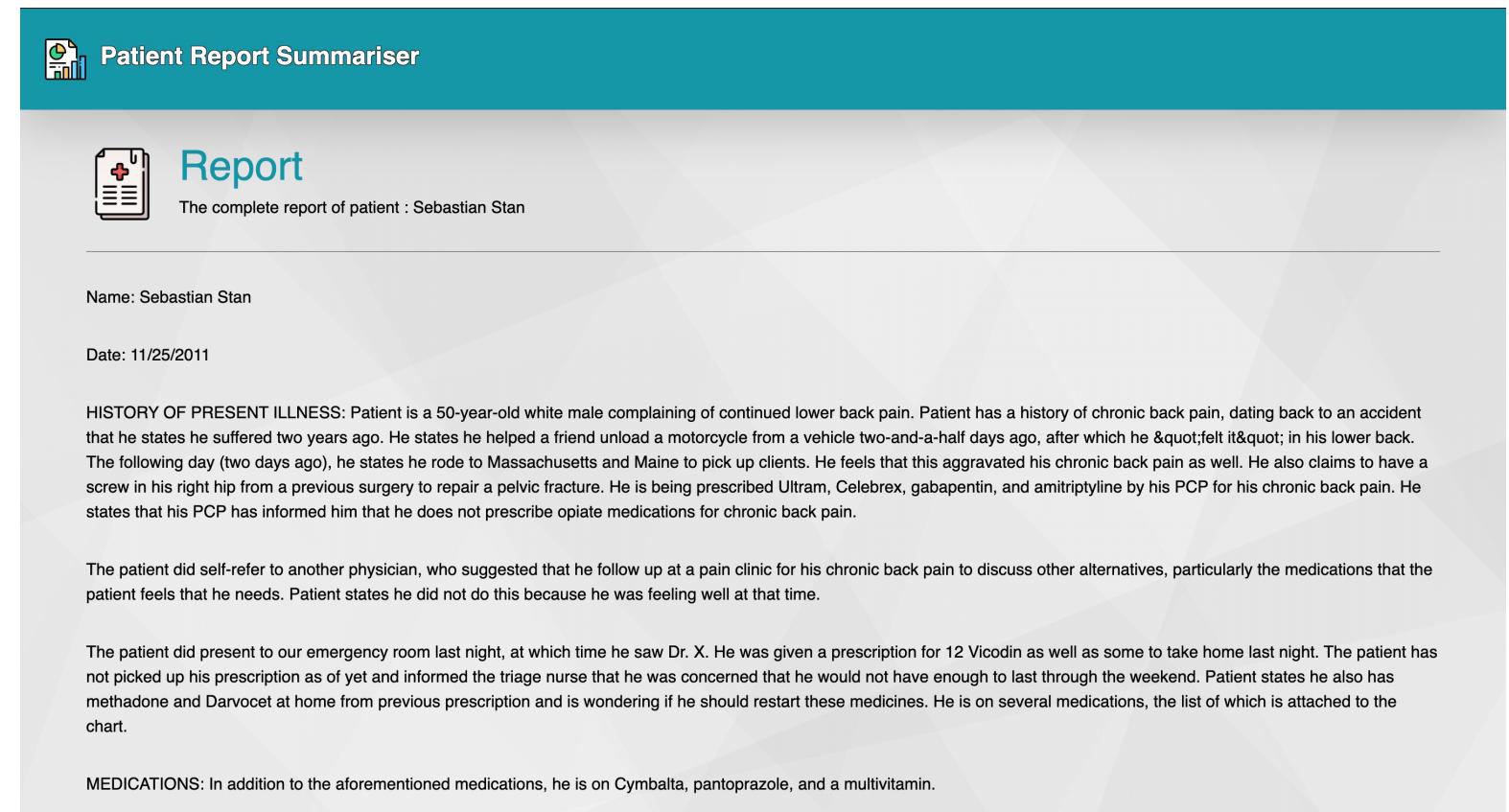
At the bottom right of the search area, there are two buttons: 'Submit' (teal) and 'Reset' (orange).

# SCREENSHOTS

The screenshot shows the 'Patient Report Summariser' application. At the top, there is a teal header bar with the title 'Patient Report Summariser'. Below the header, a section titled 'Search & Summarise' features a magnifying glass icon and the sub-instruction 'Get a gist of the patient's report or easily find a patient with a particular symptom'. The main search area contains three input fields: 'appointment' (with placeholder text), a date range from '2009-02-20' to '2021-05-20', and two buttons: 'Submit' (teal) and 'Reset' (orange). Below this is a table with three columns: 'Patient Name', 'Report Date', and 'Actions'. A single row is present, showing 'Sebastian Stan' as the patient name and '2011-11-25' as the report date. Under the 'Actions' column for this row are two buttons: 'View' (grey) and 'Summarize' (teal).

Patient Name	Report Date	Actions
Sebastian Stan	2011-11-25	<button>View</button> <button>Summarize</button>

# SCREENSHOTS



The screenshot shows a web-based application titled "Patient Report Summariser". The header features a teal bar with the title and a small icon of a document with a chart. Below the header, a section titled "Report" contains a sub-section titled "The complete report of patient : Sebastian Stan". The patient's name, "Sebastian Stan", is listed under "Name" and the date, "11/25/2011", is listed under "Date". The main content area contains three paragraphs of text describing the patient's history of present illness, their visit to an emergency room, and their current medications.

**Patient Report Summariser**

**Report**  
The complete report of patient : Sebastian Stan

Name: Sebastian Stan

Date: 11/25/2011

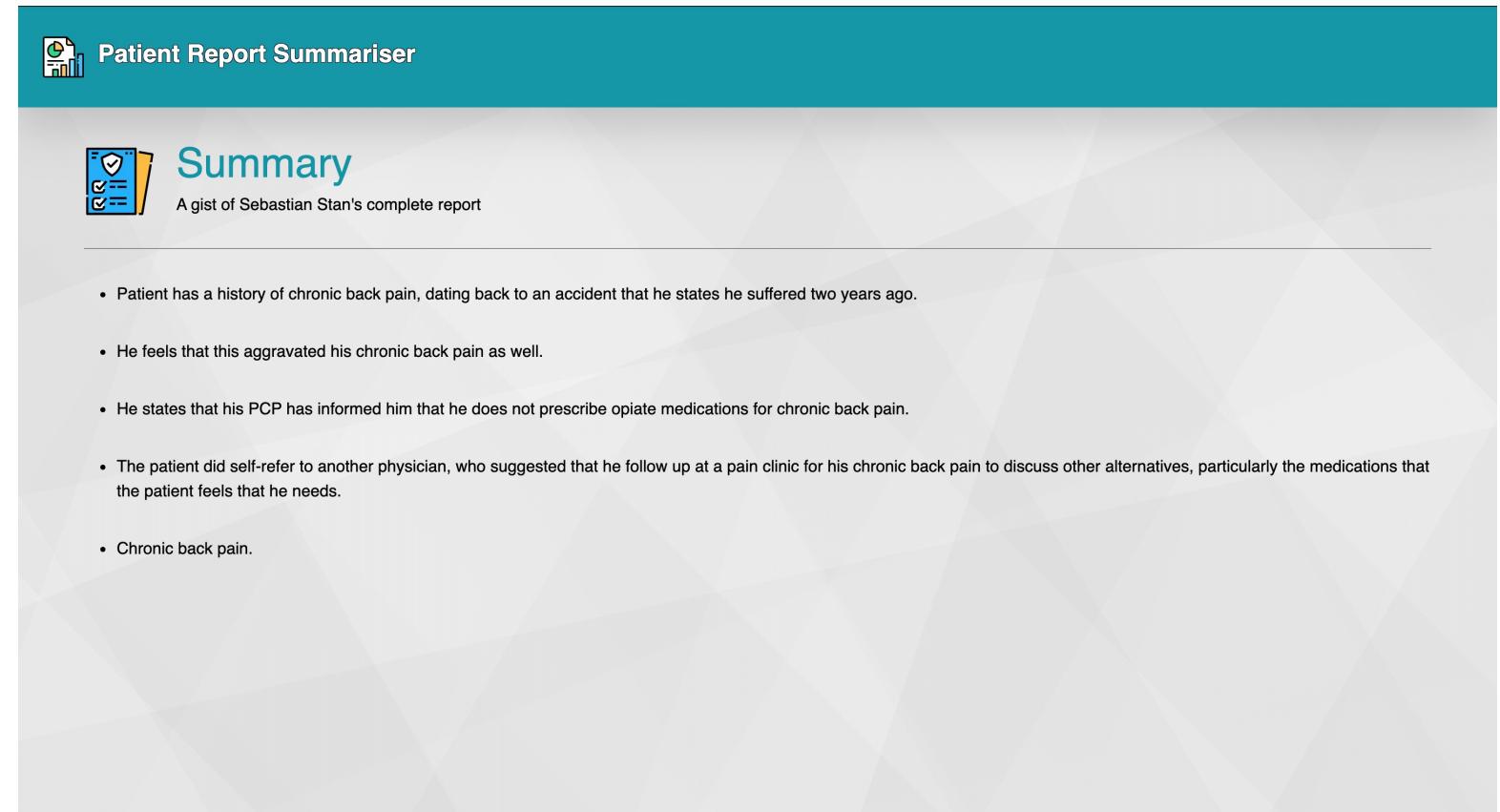
**HISTORY OF PRESENT ILLNESS:** Patient is a 50-year-old white male complaining of continued lower back pain. Patient has a history of chronic back pain, dating back to an accident that he states he suffered two years ago. He states he helped a friend unload a motorcycle from a vehicle two-and-a-half days ago, after which he "felt it" in his lower back. The following day (two days ago), he states he rode to Massachusetts and Maine to pick up clients. He feels that this aggravated his chronic back pain as well. He also claims to have a screw in his right hip from a previous surgery to repair a pelvic fracture. He is being prescribed Ultram, Celebrex, gabapentin, and amitriptyline by his PCP for his chronic back pain. He states that his PCP has informed him that he does not prescribe opiate medications for chronic back pain.

The patient did self-refer to another physician, who suggested that he follow up at a pain clinic for his chronic back pain to discuss other alternatives, particularly the medications that the patient feels that he needs. Patient states he did not do this because he was feeling well at that time.

The patient did present to our emergency room last night, at which time he saw Dr. X. He was given a prescription for 12 Vicodin as well as some to take home last night. The patient has not picked up his prescription as of yet and informed the triage nurse that he was concerned that he would not have enough to last through the weekend. Patient states he also has methadone and Darvocet at home from previous prescription and is wondering if he should restart these medicines. He is on several medications, the list of which is attached to the chart.

**MEDICATIONS:** In addition to the aforementioned medications, he is on Cymbalta, pantoprazole, and a multivitamin.

# SCREENSHOTS



The screenshot shows a mobile application interface titled "Patient Report Summariser". The top section has a teal header with the app's name. Below it is a white content area. On the left, there is a small icon of a clipboard with a checkmark. To its right, the word "Summary" is displayed in a large, bold, teal font. Underneath "Summary", the text "A gist of Sebastian Stan's complete report" is written in a smaller, gray font. A horizontal line separates this from the main content. The main content is a bulleted list of patient information, presented in a black font:

- Patient has a history of chronic back pain, dating back to an accident that he states he suffered two years ago.
- He feels that this aggravated his chronic back pain as well.
- He states that his PCP has informed him that he does not prescribe opiate medications for chronic back pain.
- The patient did self-refer to another physician, who suggested that he follow up at a pain clinic for his chronic back pain to discuss other alternatives, particularly the medications that the patient feels that he needs.
- Chronic back pain.

# SCREENSHOTS

Patient Report Summariser

 Team  
Details of students who have developed this project

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# THANK YOU