BROCK UNIVERSITY
FACULTY OF MATHEMATICS AND SCIENCE

COSC 4P02 - CANADA GAMES CHATBOT

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TEAM UNDEFINED FINAL PROGRESS REPORT

DEPARTMENT OF COMPUTER SCIENCE
ST. CATHARINES, ONTARIO, CANADA

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1. PREFACE

This Report will highlight the Software Requirements Specification we received at the beginning of this project. It will show where and how we achieved success or failure on these requirements. This Report will also highlight our final two sprints, and will contain an Installation Manual.

2. INSTALLATION MANUAL

2.1. Back-End

- **Requirements**
  - Node.js environment
  - Node Modules
    - Socket.io
    - Python-shell
  - Python 3.9.0 local enviornment named ”venv”.
  - Python modules
    - pandas.
    - selenium.
    - Haystack from https://haystack.deepset.ai/overview/installation. (pip install farm-haystack) recommended.
    - pytorch-scatter.
    - unidecode.

- **Initialization Steps**
  - npm install on the ”Back-end” directory.
  - create a local python 3.9.0 environment called ”venv” in the root directory of Back-End.
  - install required modules.
  - install MySql, recommended:-¿ https://www.mysql.com/downloads/
  - npm start
  - make sure .env in the root back-end folder has MYSQL_USER, MYSQL_PASSWORD, SALT, ADMIN_PASSWORD.

- **Additional Info**
  - The username for admin login on front end is ”admin” as functionality for addition or removal of admins to sql server was not implemented.

- Admin panel can be accessed by entering ”font-end url”/admin.
- All scrapes are executed by an admin. Login to the Admin panel and click on the Scrape button in the top left of scrape component.
- At any point the server is down the wifi icon on the screen will flash both for admin and user. They can try to reconnect by clicking on that icon.
- During initial launch the Ai module will download Google Tapas models and Bert model which might cause it to take a while to initialize.s

2.2. Front-End

- **Requirements**
  - React JS
- **Initialization Steps**
  - npm install on the ”Front-End” directory
  - npm run

2.3. Credit

- **Credit for Ai models**
  - `https://haystack.deepset.ai/tutorials/table-qa`
  - `https://arxiv.org/abs/2108.04049`
  - `https://huggingface.co/google/tapas-large-finetuned-sqa`
  - Microsoft Question Answering

3. OVERALL DESCRIPTION

3.1. Operating Environment

The operating environment of the chat-bot is within a browser. As a browser is available on most Operating system, it is easy to access the chat-bot.

3.2. Design and Implementation Constraints

3.2.1. Language Constraints

The chat-bot only operates in the English Language in the text form. Furthermore to get accurate answers the questions asked provide more information. For example the bot will perform better for ”When does Canoe C 1 200m Female take place?” instead of ”When does Canoe take place?”. As there are multiple events for Canoe.

3.2.2. Area Based Constraints

The current version of software is intended for the Canada Games Event. The framework is designed such that scraped data from different websites can be stored into different databases and loaded for user upon request. Which makes it easier to include the Brock University data.

3.2.3. Browser Support

- Chromium based browsers
- Mozilla Firefox
- Safari

3.2.4. Device Support

The chat-bot application supports all devices that support an Internet browser such as Chrome.

3.2.5. Reasonably Accurate Language Processing & Responses

To a certain degree, the AI can answer questions related to smaller data-sets with High Accuracy. However, when it comes to larger data-sets, Accuracy is reduced due to a Weakly Supervised Model that is implemented. Implementation of a Supervised Model for questions generated from the scraped data would be a consideration for future updates. The AI will try to answer the question with a minimum prediction threshold of 85%. If the predicted answer does not meet this threshold the user is responded with ”The AI was not able to generate an answer for your question”.

3.2.6. Simple and Intuitive UI Design

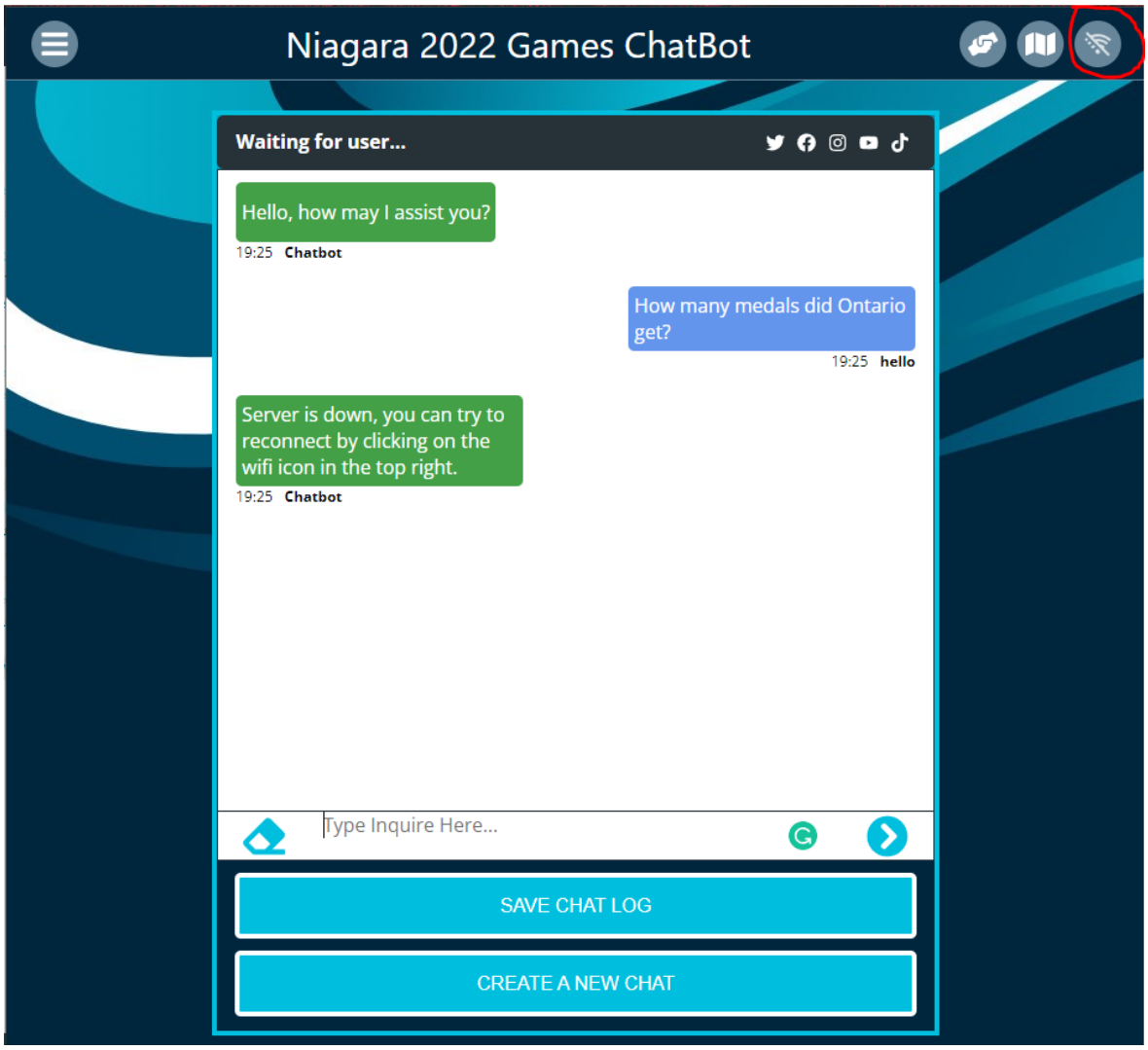
In terms of Simplicity most of the elements are available at the home screen. Links such as Canada Games News, Transit and Tickets are given appropriate icons in the navbar. Additionally the Chat-bot hints the Users to appropriate icons.

3.3. User Documentation

To help understand the chat-bot our team has created a ”How To” video on YouTube. Please click here to view it.

3.4. Assumptions and Dependencies

In the occurrence of the Canada games website being unavailable or down for maintenance etc. This software will still be available with limited functionality. In the following image, you will be able to see the icon displaying Wi-Fi status circled in red. If the server is unavailable for any reason, or the Wi-Fi is down, this symbol will be displayed with a line through it, to notify the user that the software has limited functionality. The user can try to reconnect by clicking on the icon.

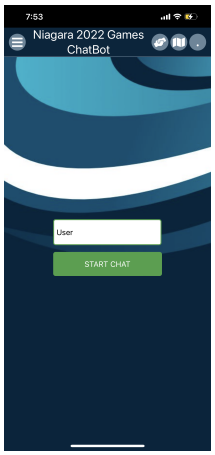

Niagara 2022 Games ChatBot
Waiting for user...
Hello, how may I assist you?
19:25 Chatbot
How many medals did Ontario get?
19:25 hello
Server is down, you can try to reconnect by clicking on the wifi icon in the top right.
19:25 Chatbot
Type Inquire Here...
SAVE CHAT LOG
CREATE A NEW CHAT

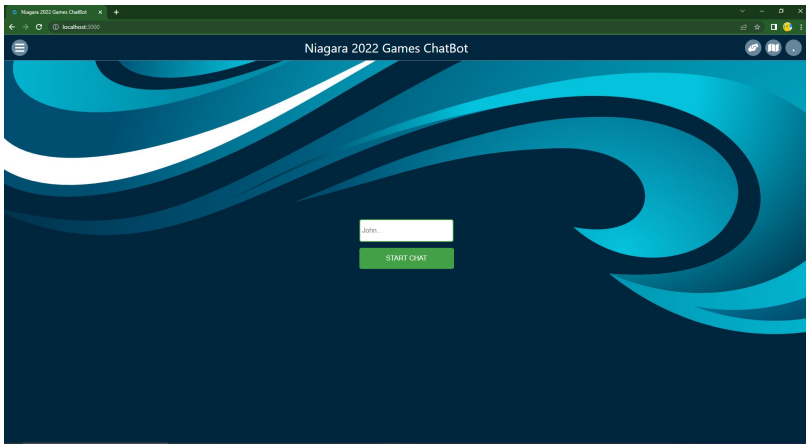
4. EXTERNAL INTERFACE REQUIREMENTS

4.1. User Interfaces

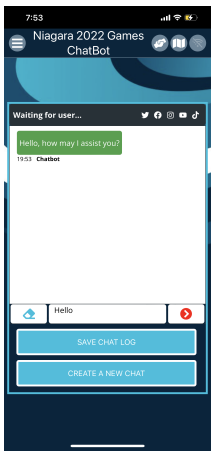
4.1.1. Starting Menu

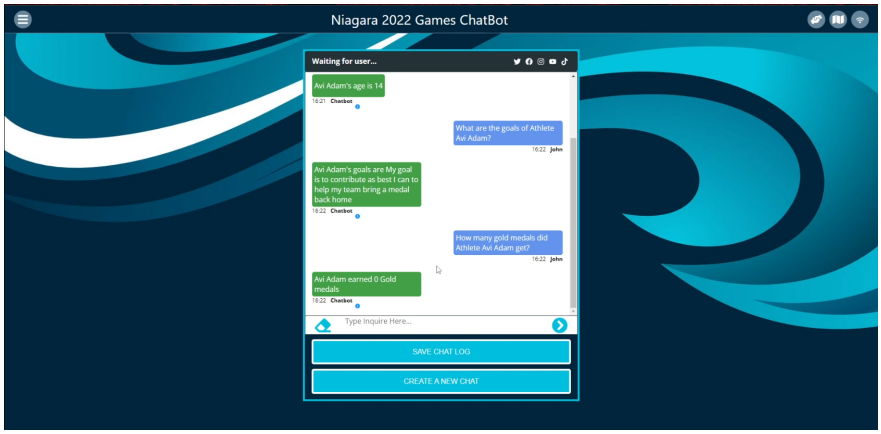
The starting menu is a separate page that prompts the User to enter their Username and a button to start the chat-bot. As this is a browser-based application, the exit button is simply located on the top right of the browser. The Screen is custom suited to fit both mobile devices and traditional computers and laptop screens. The start Chat button will take the User to the usage screen.





4.1.2. Usage Screen





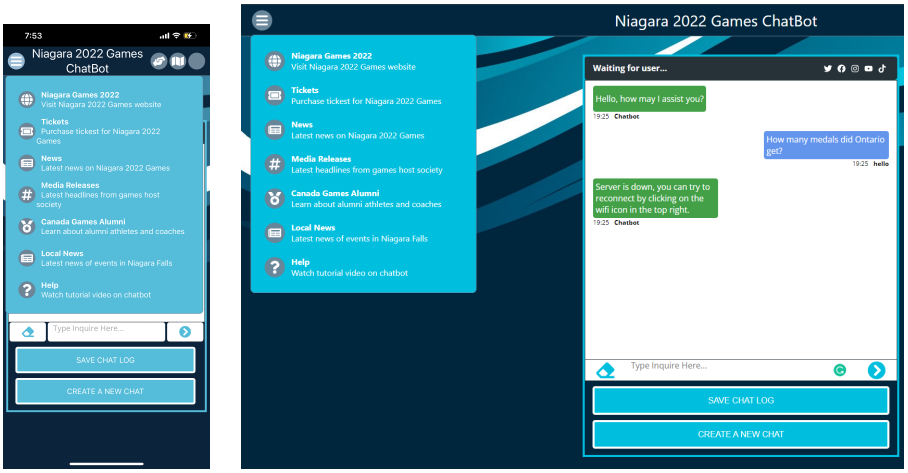
4.1.3. Input Bar

- The left most button clears the input field.
- The right most button sends the query.

4.1.4. Buttons

- Exit Button. For both Desktop and Mobile Application closes when the tab/browser is closed.
- Return Button. For both Desktop and Mobile back button of the browser can be user to return to the main page.
- Wi-Fi Only Button: Our application is browser based and thus, this button is not necessary. However, there is a Wi-Fi indicator status. That will showcase whether the application is connected or not
- Chat Log Button: A save chat log button is provided to the user which will transfer the chat text into a .txt file that can be downloaded by the user. This provides the user with a copy/paste-able version of the entire conversation
- Frame Rate Buttons: Since this is a browser-based application, this option is not needed as all the processing will be done over the back-end servers.
- Send Button: at the end of input text bar, there is a send button indicated by the right-angle bracket.

4.1.5. Optional: Button Menu



4.1.6. Admin Page

Admin page was implemented to make it easier for admins to manage the server.
It allows an admin to execute a scrape to update the data stored on SQL and reinitialize AI.
It also shows logs of errors/updates of components.
View Scraped data and tests.

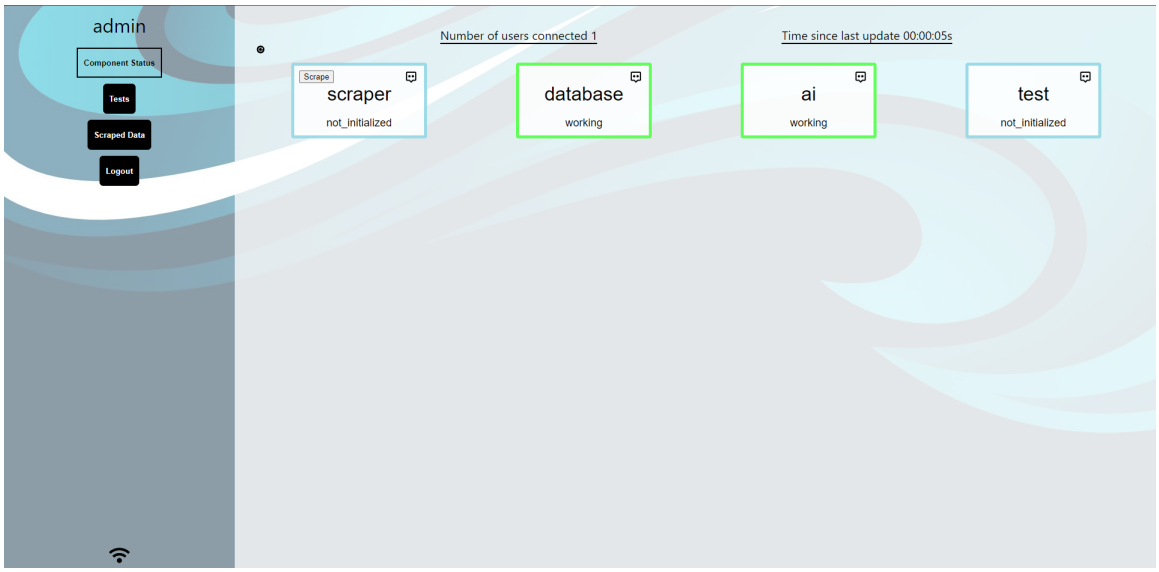


Figure 4.1: Components

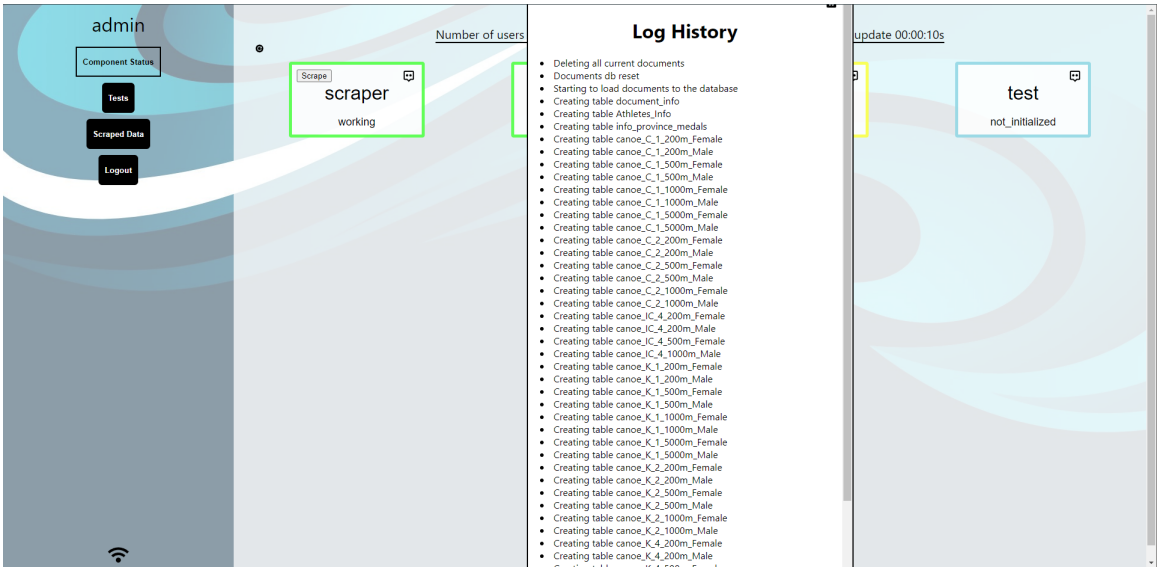


Figure 4.2: Log History

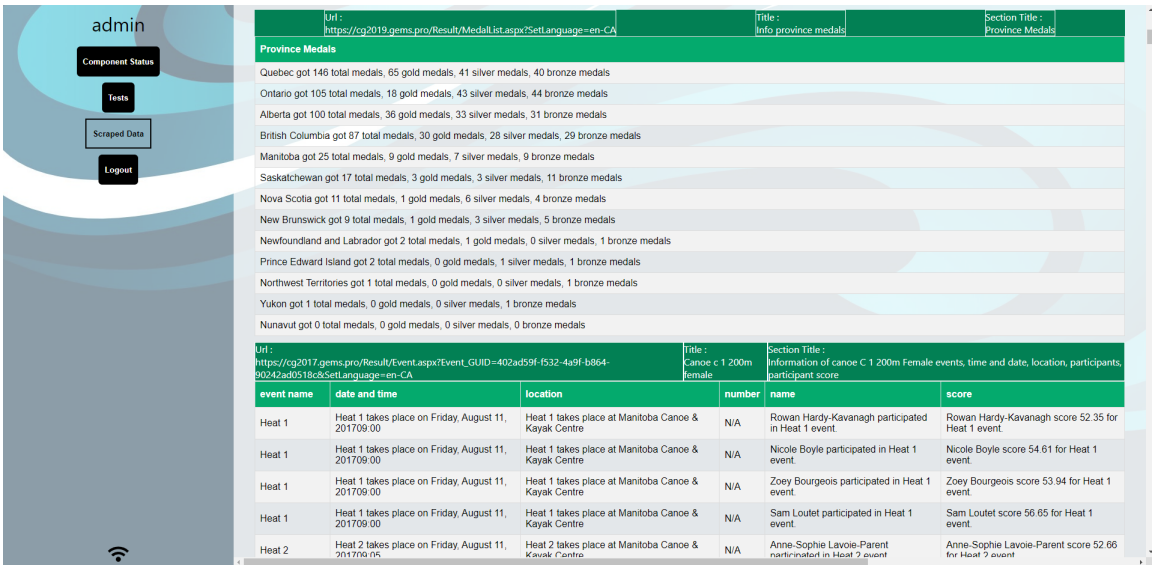


Figure 4.3: Scraped Documents

4.2. Hardware Interfaces

4.2.1. Computers

A physical keyboard can be used to enter text into the input bar and allows all standard characters. Pressing the Enter key within the Input bar will send a message. Mouse/Trackpad will be used in selecting different buttons, drop down menus, navigating to different web-pages via the left click. Scroll down wheel is used for scrolling the log and additional web pages.

4.2.2. Touchscreen Devices

- Touchscreen devices using this application rely on using tapping for primary mouse clicks. Scrolling is performed by swiping(gesture) up or down. A virtual keyboard is show when the user taps the input text bar and can be minimized as well.
- The clipboard functionality is provided by downloading a text file for the chat log on the relevant device that is used.

4.3. Storage Interfaces

4.3.1. Database

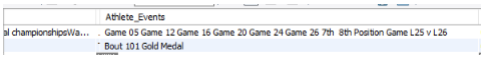
An external Database (MySQL) is utilized, which will update its data by scraping the Canada Games website. Scrape times can vary depending on the size of the data that is being scraped. These scrapes are important in the event of losing connection to servers or a maintenance occurring. The application is still able to use the data that is stored within the Database

4.3.2. Athletes

Our database, for athletes, has the following columns: URL, Athlete Name, Athlete Province, Athlete Hometown, Athlete Sport, Athlete Age, Athlete Height, Athlete Weight, Athlete Club, Athlete Coach, Athlete Team Position, Athlete Previous Alias, Athlete Alias, Athlete Goals, Athlete Personal Best, Athlete Awards, Athlete Role Model, Athlete Events, Athlete Gold Medals, Athlete Silver Medals, Athlete Bronze Medals, Athlete Placings

ete_Province	Athlete_Sport	Athlete_Age	Athlete_Height	Athlete_Weight	Athlete_Club
Scotia	Hockey	14	170	61	Selects Academy at Bishop Kearney
io	Wheelchair Basketball	19	165	44	Variety Village Rolling Rebels
atchewan	Gymnastics	19	162	54	CanAm gymnastics club
io	Speed Skating	18	56		
ec	Judo	18	1m83cm	845	Shidokan
n	Badminton	16	176	72	
Brunswick	Cross Country Skiing	16	165	54	Sureau Blanc inc de TracadieSheila
ec	Gymnastics	16	168 cm	56 g	Club de gymnastique Laval Excellence
atchewan	Alpine Skiing	14	152	485	

Athlete_Name	Athlete_Province	Athlete_Hometown	Athlete_Sport	Athlete_Age
Avi Adam	Nova Scotia	Wolfville Nova Scotia	Hockey	14
Avery Martin Duval	Quebec	Hawkesbury ontario	Boxing	17



During our presentation, we only had the values listed within the columns. To add a human-like response, and improve answer accuracy, we appended some information to these columns in the latest version.

The new and improved columns, with modified values

Name	Province	Sport	Age	Height
Avi Adam	Avi Adam's co...	Avi Ad...	Avi Adam's age is 14	Avi Adam's height is 170
Adel Akh...	Adel Akhmed's...	Adel A...	Adel Akhmed's age is 19	Adel Akhmed's height is 165
Ashley A...	Ashley Anaka'...	Ashley ...	Ashley Anaka's age is 19	Ashley Anaka's height is 162
Alexa A...	Alexa Annecc...	Alexa ...	Alexa Annecca's age is 18	Alexa Annecca's height is 56
alexandr...	alexandre are...	alexan...	alexandre arencibia's age is 18	alexandre arencibia's height is 1m83cm
Austin M...	Austin Meng A...	Austin ...	Austin Meng Au's age is 16	Austin Meng Au's height is 176
Ariane A...	Ariane Austin'...	Ariane ...	Ariane Austin's age is 16	Ariane Austin's height is 165
Anthony...	Anthony Balan...	Anthon...	Anthony Balan's age is 16	Anthony Balan's height is 168 cm
Gail Balkwill	Gail Balkwill's c...	Gail Bal...	Gail Balkwill's age is 14	Gail Balkwill's height is 152
Alexis B...	Alexis Barabe'...	Alexis ...	Alexis Barabe's age is 16	Alexis Barabe's height is 180
Aron Bar...	Aron Bargen's ...	Aron B...	Aron Bargen's age is 18	Aron Bargen's height is 185
Aron Bar...	Aron Bargen's ...	Aron B...	Aron Bargen's age is 18	Aron Bargen's height is Not Available
Anna Ba...	Anna Barringt...	Anna B...	Anna Barrington's age is 14	Anna Barrington's height is 55
Austin B...	Austin Bauer's...	Austin ...	Austin Bauer's age is 22	Austin Bauer's height is 185
Anthony...	Anthony Bdar...	Anthon...	Anthony Bdard's age is 15	Anthony Bdard's height is 173
Alexisse ...	Alexisse Brard'...	Alexiss...	Alexisse Brard's age is 17	Alexisse Brard's height is 168
Alyssa B...	Alyssa Berger...	Alyssa ...	Alyssa Bergeron's age is 15	Alyssa Bergeron's height is 155
Andrew ...	Andrew Patric...	Andre...	Andrew Patrick Binns's age i...	Andrew Patrick Binns's height is Not ...
Arno Bla...	Arno Blacquire...	Arno Bl...	Arno Blacquire's age is 17	Arno Blacquire's height is 170
Amelie Bl...	Amelie Blanton...	Amelie ...	Amelie Blanton's age is 13	Amelie Blanton's height is 152
Alex Bou...	Alex Boucher's...	Alex B...	Alex Boucher's age is 16	Alex Boucher's height is 168
Annick B...	Annick Boudre...	Annick ...	Annick Boudreau's age is 16	Annick Boudreau's height is 1625

Weight	Club	Coach	Team_Position	Previous_Alias
Avi Adam's weight is 61	Avi Adam belon...	Avi Adam's co...	Avi Adam's positio...	Avi Adam's previous a
Adel Akhmed's weight is 44	Adel Akhmed be...	Adel Akhmed's...	Adel Akhmed's po...	Adel Akhmed's previo
Ashley Anaka's weight is 54	Ashley Anaka b...	Ashley Anaka'...	Ashley Anaka's p...	Ashley Anaka's previc
Alexa Annecca's weight is Not A...	Alexa Annecca ...	Alexa Annecca...	Alexa Annecca's ...	Alexa Annecca's prev
alexandre arencibia's weight is 845	alexandre aren...	alexandre are...	alexandre arencib...	alexandre arencibia's
Austin Meng Au's weight is 72	Austin Meng Au...	Austin Meng A...	Austin Meng Au's ...	Austin Meng Au's pre
Ariane Austin's weight is 54	Ariane Austin b...	Ariane Austin's...	Ariane Austin's po...	Ariane Austin's previc
Anthony Balan's weight is 56 g	Anthony Balan ...	Anthony Balan...	Anthony Balan's p...	Anthony Balan's prev
Gail Balkwill's weight is 485	Gail Balkwill belo...	Gail Balkwill's c...	Gail Balkwill's posit...	Gail Balkwill's previous
Alexis Barabe's weight is 812	Alexis Barabe b...	Alexis Barabe'...	Alexis Barabe's p...	Alexis Barabe's previc
Aron Bargen's weight is 76	Aron Bargen bel...	Aron Bargen's ...	Aron Bargen's po...	Aron Bargen's previo
Aron Bargen's weight is Not Avai...	Aron Bargen bel...	Aron Bargen's ...	Aron Bargen's po...	Aron Bargen's previo
Anna Barrington's weight is 558	Anna Barringto...	Anna Barringt...	Anna Barrington's...	Anna Barrington's pre
Austin Bauer's weight is 80	Austin Bauer be...	Austin Bauer's ...	Austin Bauer's po...	Austin Bauer's previo
Anthony Bdard's weight is 64	Anthony Bdard ...	Anthony Bdar...	Anthony Bdard's ...	Anthony Bdard's prev
Alexisse Brard's weight is 70	Alexisse Brard b...	Alexisse Brard'...	Alexisse Brard's p...	Alexisse Brard's previ
Alyssa Bergeron's weight is 5669	Alyssa Bergero...	Alyssa Berger...	Alyssa Bergeron's...	Alyssa Bergeron's pre
Andrew Patrick Binns's weight is ...	Andrew Patrick ...	Andrew Patric...	Andrew Patrick Bi...	Andrew Patrick Binns'
Arno Blacquire's weight is 59	Arno Blacquire ...	Arno Blacquire'...	Arno Blacquire's p...	Arno Blacquire's prev
Amelie Blanton's weight is 39	Amelie Blanton ...	Amelie Blanton...	Amelie Blanton's p...	Amelie Blanton's prev
Alex Boucher's weight is Not Ava...	Alex Boucher b...	Alex Boucher's...	Alex Boucher's po...	Alex Boucher's previc
Annick Boudreau's weight is 62	Annick Boudrea...	Annick Boudre...	Annick Boudreau'...	Annick Boudreau's pr

4.3.3. Sports Dates

What days of the week a particular sport is being played.

```
1 •   SELECT * FROM testdb.info_sports_dates;
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Conte

id	Sports_Name	Sports_Dates
0	Athletics	Tuesday, August 16, 2022, and Wednesday, August 17, 2022, and Friday, August 19, 20...
1	Baseball	Sunday, August 7, 2022, and Monday, August 8, 2022, and Tuesday, August 9, 2022, an...
2	Basketball	Monday, August 8, 2022, and Tuesday, August 9, 2022, and Wednesday, August 10, 20...
3	Box Lacrosse	Sunday, August 7, 2022, and Monday, August 8, 2022, and Tuesday, August 9, 2022, an...
4	Canoe Kayak	Tuesday, August 16, 2022, and Wednesday, August 17, 2022, and Thursday, August 18,...
5	Cycling	Monday, August 8, 2022, and Wednesday, August 10, 2022, and Friday, August 12, 202...
6	Diving	Tuesday, August 16, 2022, and Wednesday, August 17, 2022, and Thursday, August 18,...
7	Golf	Wednesday, August 17, 2022, and Thursday, August 18, 2022, and Friday, August 19, 2...
8	Rowing	Wednesday, August 17, 2022, and Thursday, August 18, 2022, and Saturday, August 20...
9	Rugby Sevens	Monday, August 8, 2022, and Tuesday, August 9, 2022
10	Sailing	Wednesday, August 17, 2022, and Thursday, August 18, 2022, and Friday, August 19, 2...
11	Soccer	Sunday, August 7, 2022, and Monday, August 8, 2022, and Tuesday, August 9, 2022, an...
12	Softball	Sunday, August 7, 2022, and Monday, August 8, 2022, and Tuesday, August 9, 2022, an...
13	Swimming	Sunday, August 7, 2022, and Monday, August 8, 2022, and Tuesday, August 9, 2022, an...

4.3.4. Province Medals

How province medals are stored in the database.

```
1 •   SELECT * FROM testdb.info_province_medals;
```

Result Grid | Filter Rows: | Edit: | Export/Import:

id	Province_Medals
0	Quebec got 146 total medals, 65 gold medals, 41 silver medals, 40 bronze medals
1	Ontario got 105 total medals, 18 gold medals, 43 silver medals, 44 bronze medals
2	Alberta got 100 total medals, 36 gold medals, 33 silver medals, 31 bronze medals
3	British Columbia got 87 total medals, 30 gold medals, 28 silver medals, 29 bronze medals
4	Manitoba got 25 total medals, 9 gold medals, 7 silver medals, 9 bronze medals
5	Saskatchewan got 17 total medals, 3 gold medals, 3 silver medals, 11 bronze medals
6	Nova Scotia got 11 total medals, 1 gold medals, 6 silver medals, 4 bronze medals
7	New Brunswick got 9 total medals, 1 gold medals, 3 silver medals, 5 bronze medals
8	Newfoundland and Labrador got 2 total medals, 1 gold medals, 0 silver medals, 1 bronze medals
9	Prince Edward Island got 2 total medals, 0 gold medals, 1 silver medals, 1 bronze medals
10	Northwest Territories got 1 total medals, 0 gold medals, 0 silver medals, 1 bronze medals
11	Yukon got 1 total medals, 0 gold medals, 0 silver medals, 1 bronze medals
12	Nunavut got 0 total medals, 0 gold medals, 0 silver medals, 0 bronze medals

4.3.5. Teams

Teams Table Part 1. Team name, team event, team members

Team_Name	Team_Event	Team_Province	Team_Members
AB	Hockey Female	Alberta	Bella McKee Bree Kennedy Payton Laumbach Ly...
AB	Artistic Swimming Team Female	Alberta	Kelsey Ayers Elizabeth Battista Dana Brunskill J...
AB	Wheelchair Basketball Mix	Alberta	Bradon Doll Jonathan Bilan Ben Tumack Reed D...
AB	Speed Skating Short Track - Team Relay Female	Alberta	Cezara Bere Victoria Goplen Caitlin Pelkey Hee...
AB	Gymnastics Trampoline - Team Mix	Alberta	Zachary Blakely Alex Boucher Kalena Soehn Nol...
AB	Table Tennis Team Male	Alberta	Anthony Chen Daniel Jiang James Li
AB	Table Tennis Doubles Male	Alberta	Anthony Chen Daniel Jiang
AB	Biathlon 3 x 6 km Relay Female	Alberta	Karly Coyne Pascale Paradis Jenna Sherrington ...
AB	Curling Female	Alberta	Julia Bakos Julianna MacKenzie Alyssa Nedohin ...
AB	Speed Skating Long Track - Team Pursuit Female	Alberta	Anna Bourgeois Brooklyn McDougall Kayla McNe...

Teams Table Part 2. Team matches, and their placement (gold, silver, bronze, or placement number)

mbach Ly...	Game 06 Game 17 Game 29 Game 12 Game 21 ...	Gold
runskill J...	Technical Routine Free Routine Technical Routin...	Gold
k Reed D...	Game 02 Game 10 Game 20 1B vs 2A Game 05 ...	Gold
key Hee...	Relay Heat 50B Relay Final 52A	Silver
oehn Nol...	Female Routine Male Routine	Silver
	Encounter 2B Encounter 207 Encounter EPLC56...	5
	Encounter 2B Encounter 210 Bronze Medal Enco...	4
errington ...	Race	Gold
Nedohin ...	Draw 1 Sheet 06 Draw 4 Sheet 08 Draw 7 She...	5
yla McNe...	Finals	Silver

4.3.6. Events

Event Table

	id	event_name	date_and_time	location
▶	0	Heat 1	Heat 1 takes place on Tuesday, August 8, 2017...	Heat 1 takes place at Manitoba Canoe & Kayak ...
	1	Heat 1	Heat 1 takes place on Tuesday, August 8, 2017...	Heat 1 takes place at Manitoba Canoe & Kayak ...
	2	Heat 1	Heat 1 takes place on Tuesday, August 8, 2017...	Heat 1 takes place at Manitoba Canoe & Kayak ...
	3	Heat 1	Heat 1 takes place on Tuesday, August 8, 2017...	Heat 1 takes place at Manitoba Canoe & Kayak ...
	4	Heat 2	Heat 2 takes place on Tuesday, August 8, 2017...	Heat 2 takes place at Manitoba Canoe & Kayak ...
	5	Heat 2	Heat 2 takes place on Tuesday, August 8, 2017...	Heat 2 takes place at Manitoba Canoe & Kayak ...
	6	Heat 2	Heat 2 takes place on Tuesday, August 8, 2017...	Heat 2 takes place at Manitoba Canoe & Kayak ...
	7	Heat 2	Heat 2 takes place on Tuesday, August 8, 2017...	Heat 2 takes place at Manitoba Canoe & Kayak ...
	8	Consolation Final	Consolation Final takes place on Tuesday, Augu...	Consolation Final takes place at Manitoba Cano...
	9	Consolation Final	Consolation Final takes place on Tuesday, Augu...	Consolation Final takes place at Manitoba Cano...
	10	Consolation Final	Consolation Final takes place on Tuesday, Augu...	Consolation Final takes place at Manitoba Cano...
	11	Final	Final takes place on Tuesday, August 8, 20171...	Final takes place at Manitoba Canoe & Kayak C...
	12	Final	Final takes place on Tuesday, August 8, 20171...	Final takes place at Manitoba Canoe & Kayak C...
	13	Final	Final takes place on Tuesday, August 8, 20171...	Final takes place at Manitoba Canoe & Kayak C...
	14	Final	Final takes place on Tuesday, August 8, 20171...	Final takes place at Manitoba Canoe & Kayak C...
	15	Final	Final takes place on Tuesday, August 8, 20171...	Final takes place at Manitoba Canoe & Kayak C...

number	name	score
N/A	Lindsay Irwin participated in Heat 1 event.	Lindsay Irwin score 4:56.32 for Heat 1 event.
N/A	Zoë Keefe participated in Heat 1 event.	Zoë Keefe score 5:37.55 for Heat 1 event.
N/A	Maddy Mitchell participated in Heat 1 event.	Maddy Mitchell score 5:02.51 for Heat 1 event.
N/A	Maeve McManus participated in Heat 1 event.	Maeve McManus score 6:01.66 for Heat 1 event.
N/A	Sophia Jensen participated in Heat 2 event.	Sophia Jensen score 4:45.91 for Heat 2 event.
N/A	Sam Loutet participated in Heat 2 event.	Sam Loutet score 4:57.23 for Heat 2 event.
N/A	Marlee Dawn MacIntosh participated in Heat 2 e...	Marlee Dawn MacIntosh score 4:47.96 for Heat...
N/A	Tea Elizabeth Anaka participated in Heat 2 event.	Tea Elizabeth Anaka score 5:05.82 for Heat 2 e...
N/A	Tea Elizabeth Anaka participated in Consolation ...	Tea Elizabeth Anaka score 5:09.65 for Consolat...
N/A	Maeve McManus participated in Consolation Fin...	Maeve McManus score 6:17.54 for Consolation ...
N/A	Zoë Keefe participated in Consolation Final event.	Zoë Keefe score 5:42.17 for Consolation Final e...
N/A	Sophia Jensen participated in Final event.	Sophia Jensen score 4:37.87 for Final event.
N/A	Maddy Mitchell participated in Final event.	Maddy Mitchell score 4:45.63 for Final event.
N/A	Sam Loutet participated in Final event.	Sam Loutet score 4:58.01 for Final event.
N/A	Marlee Dawn MacIntosh participated in Final ev...	Marlee Dawn MacIntosh score 4:45.28 for Final ...
N/A	Lindsay Irwin participated in Final event.	Lindsay Irwin score 4:53.14 for Final event.

5. SYSTEM FEATURES

5.1. Ability for the User to Ask a Question

The User can ask question to the chat-bot by entering the question in the input field and sending it using the send icon or pressing enter.

5.2. Response Time

The response time is dependent on the amount of data scraped and the number concurrent AI processes allowed.

5.3. Chat-bot Generates an Appropriate Response to Any User Inquiry

As the size of data sets increase the chat-bot's accuracy reduces below for certain questions 85%. In the event the chat-bot is unable to create appropriate response it will return a message "Chatbot is unable to create a response to your question." The solution to this problem is using supervised model instead of weakly-supervised model.

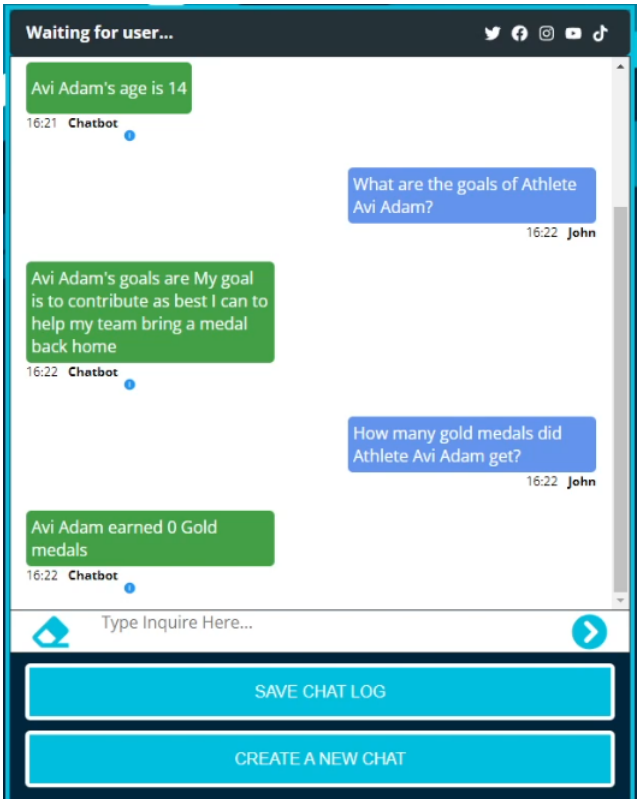
5.4. Questions Which the Software Must Be Capable of Answering - Canada Games

5.4.1. Website & Ticket Questions

Links are available in the navbar leading to Niagara 2022 website and tickets. The Chat-bot also hints to these questions when asked.

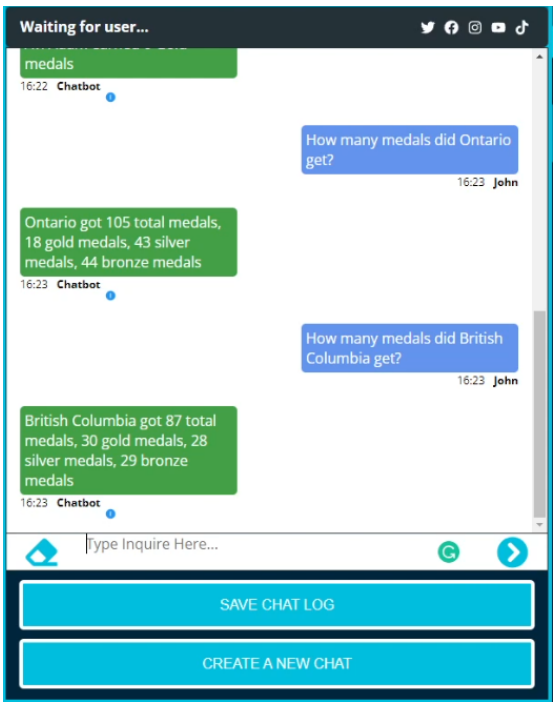
5.4.2. Athlete Questions

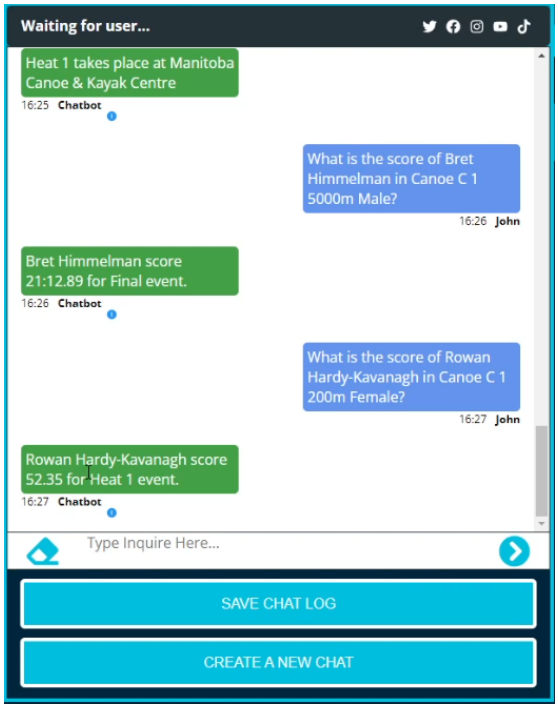
Most information available on Athlete's page is scraped. Hence the AI can respond to the questions related to AI(with increase in number of Athletes scraped the prediction accuracy decreases).



5.4.3. Scoring Questions

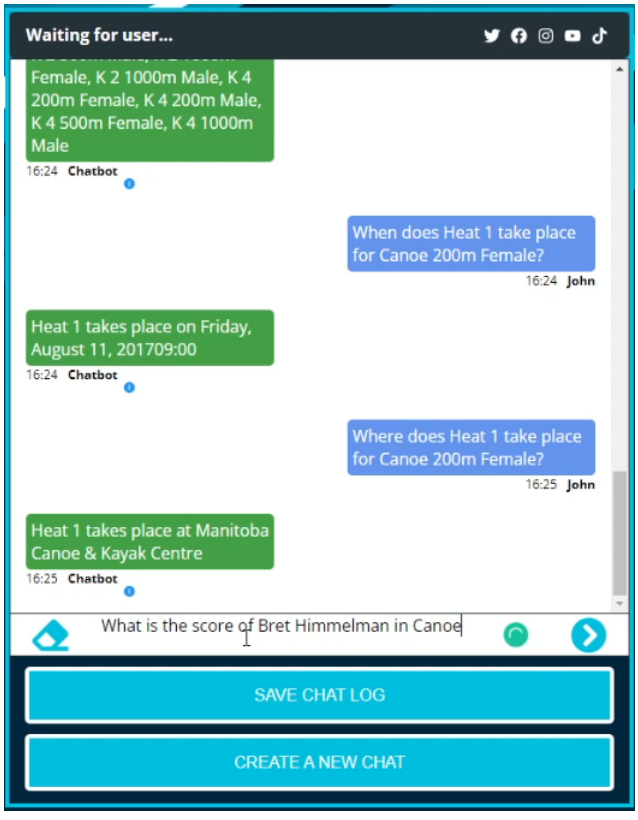
The Chat-bot is able to answer questions on Provincial medals and scores of a particular Athlete/Team for a given event.





5.4.4. Schedule Questions

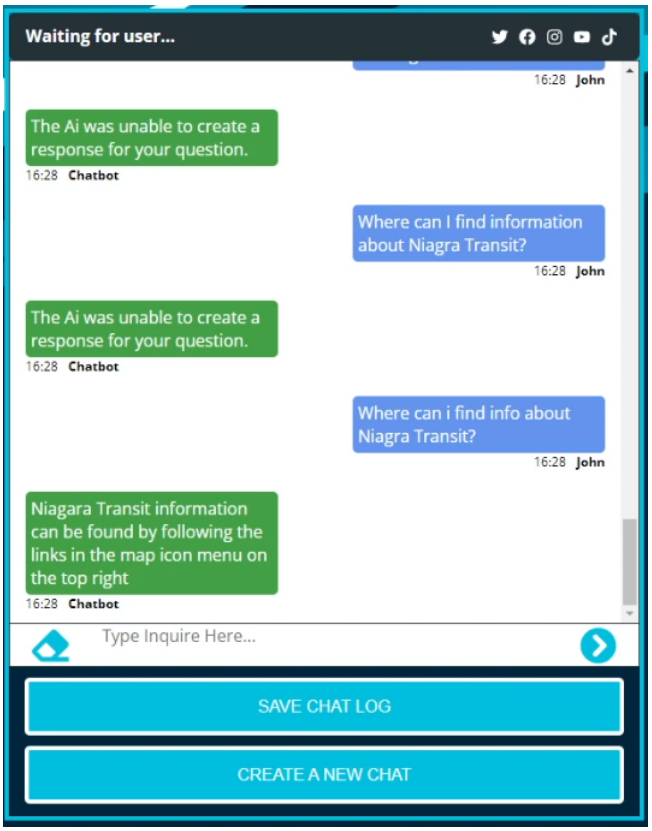
The Chat-bot is able to answer when and where a specific event is taking place.



5.5. Questions Which the Software Must be Capable of Answering - General

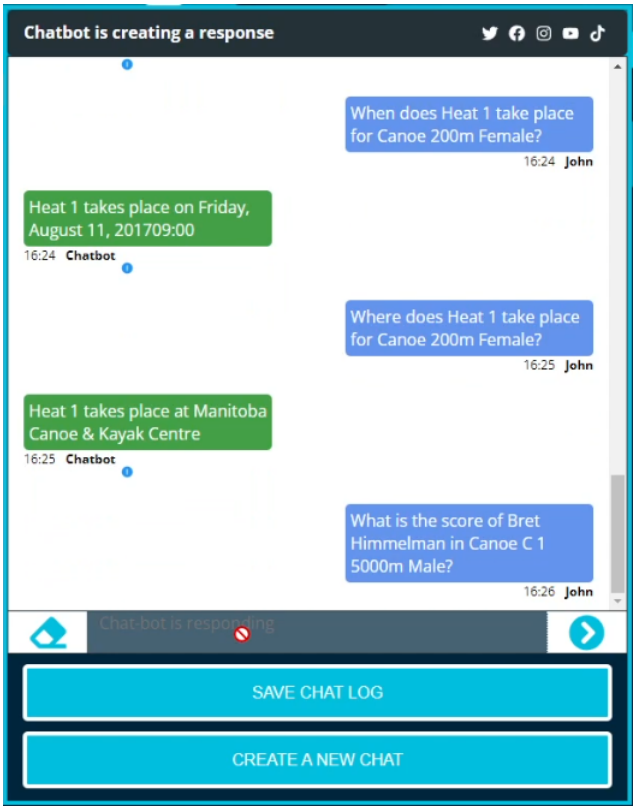
5.5.1. Local Area Questions

Questions on Local news and Niagara transit can be found by clicking on the links in the nav bar. The Chat-bot also indicates about the icons.



5.6. Chat-bot Responsiveness Indicator

During the Chat-bot is creating the response for question the input box is disabled and ”Waiting for User..” in the header changes to ”Chat-bot is creating a response”



5.7. Menu

This button has been talked about in previous functionalities as well. It contains links to Canada games news, Local news, Tickets, Canada Games Website and a Help video.

5.8. Chat Log Copy

This button allows user to download a copy messages as a text file.

5.9. Clear Input Button

This button clears the input field.

6. NON-FUNCTIONAL REQUIREMENTS

6.1. Performance

- Scrapes can only be done by Admin through the admin panel.
- A full scrape can take up-to 3 hours.

6.2. Safety

- None of the user's info is stored.
- A chat session is a web-socket which is encrypted.

6.3. Security

- MySQL username, password and admin panel's password are stored in local .env file.
- All requests (Admin & User) from Node.js to Main python module are parsed through Json and each request has a unique keyword. By default the request is rejected if keywords do not match.
- Upon Admin login an session id is created for the admin.
- Any admin request from front-end contains the session id. The request is only processed if the session id matches. Upon logout the admin session is deleted.
- Same account cannot be used in multiple browsers as session id would already exists in the admin buffer.

6.4. Quality

We ensured that code was reused when applicable, and ensured to do ample testing of components, components working together, and the overall system.

6.4.1. Adaptability

The system is adaptable in such a way that when new information is added to the Gems Pro site, on the next scrape of the site that new information will be added to our database and will be accessible by the bot. This way when a new athlete is added or a score is updated, the bot will have the most up to date information. The software would be available to be used for future summer games, all that would need to be changed is the URL of the scraped data, so changing 2022 URL to 2024 URL as an example.

6.4.2. Availability

The software is available online, so it can be accessed from any device that can access a web browser.

6.4.3. Correctness

We have discussed our chat-bots accuracy/correctness in section 5.3.

6.4.4. Flexibility

On small data-sets our bot is able to determine the correct information a user requested if they make a spelling mistake, but on larger data-sets the bot may mistake what the user is intending to say.

6.4.5. Maintainability

This software will last for as long as necessary. If they wanted to use it for future games, they would simply need to replace the URLs scraped, and update the UI with appropriate year information. No major UI changes would be necessary, and no database changes would be necessary. Only the Scraped URLs would need to be updated.

6.4.6. Portability

Since ours is a browser based software this was less of a concern. It will run on all major browsers.

6.4.7. Reliability

Our browser based software is reliable in that it does not become unresponsive, and when the server is down it notifies the user and they may attempt to reconnect to the server.

6.4.8. Reusability - Software

The software is written in a way that if you were to replace the information given to the database, this could act as a chatbot for a completely different dataset. The scrapers are custom made for the Canada Games website however, so they would require slightly more refactoring to work for a different website but the reusability of the scraper is still high in general, and is very reusable for different versions of the Canada Games site (2017, 2019, 2022 etc).

6.4.9. Robustness

The software is relatively difficult to break. If there is a loss of internet connection or connection to the server the user is notified and the request is terminated. The chatbot only accepts one question at a time from the user so that a user cannot overwhelm the bot.

6.4.10. Testability

While we were unable to complete a full test suite for the software, it was developed in a way that it is testable in components and as a whole. The testable components include the AI, Database, UI, and Scrapers. We mention testing more in-depth in Section 8.

6.4.11. Scalability

In terms of Scalability,for software, a redefined model of the AI from Weakly supervised to Supervised Learning would improve scalability by reducing overhead in resource management. in terms of hardware, by adding additional servers, it is possible to meet the additional work load of the application with increasing concurrent users.

7. OTHER REQUIREMENTS

7.1. Data Collection and Database Requirements

At the project's inception we attempted to gain access to the Canada Games Database through the Project Owner but this was not possible. Our solution was to instead create our own database and collect the information ourselves with custom built scrapers for each portion of the site where critical information could be found. These scrapers will be run from the administration side of our bot. The administrator will log in to the software and run a scrape which will go through all relevant pages and on first instance create the database and fill it it's tables, and on subsequent requests will update the database tables with the new information.

Aside from entering a name to begin chatting with the bot, no user information is collected, and nothing is stored.

8. TESTING

In terms of testing, we had the following in mind when we first approached it:

• Creating test cases for interacting with the AI to ensure proper output is achieved, such as: properly responding to invalid requests, responding to scenarios where information is not available, and responding with information.

• Looking into an automated workflow for testing these sub-processes of the application.

• Ensuring the functionality of the application is complete and fully satisfies user requirements.

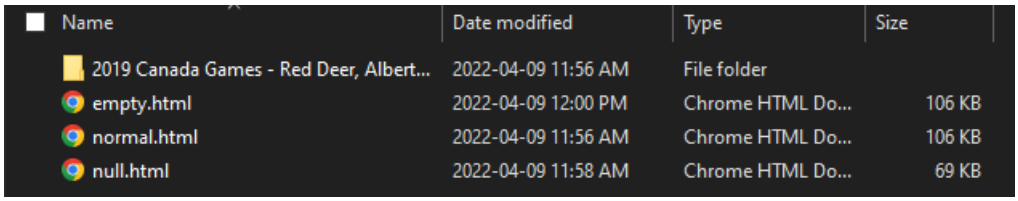
• Ensuring the application and its functionality is what the user actually wants.

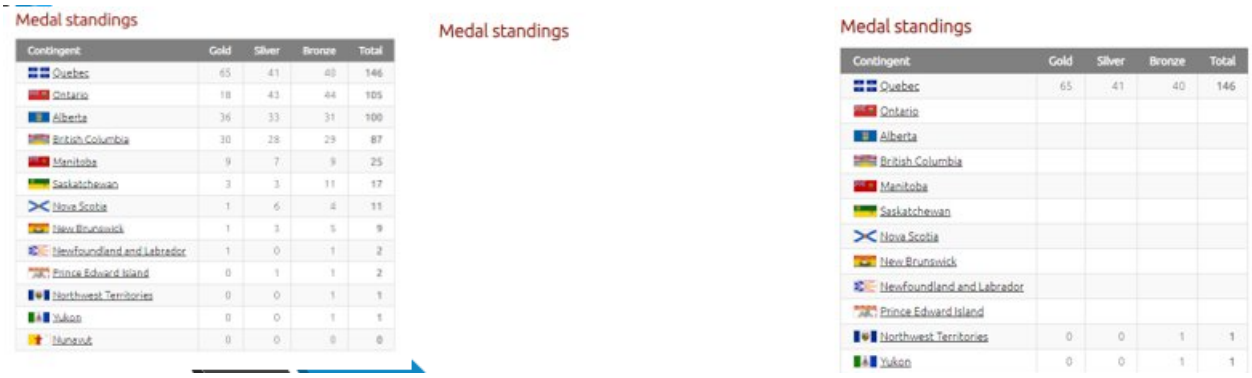
While we did not use an automated unit testing, we created our own testing files.

Results of automated tests on province medals scraping file.

When approaching scraping, we went to the Canada games website and downloaded the pages we were scraping. From these HTML files, we edited the HTML to remove tables, sections, and even removing everything to see how our scraping modules would interact with these varying displays. As seen from the image, 5 tests passed, while one test failed. One such test involved a province page where everything was removed, so it was outright

blank. When testing the scraping module, it crashed when it didn't encounter the table that contained all the provinces, medals, ext.



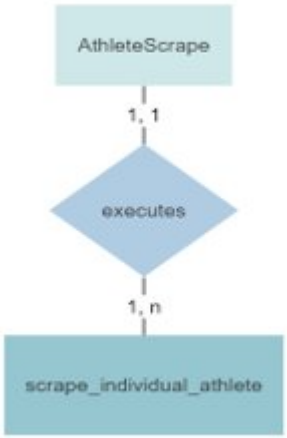


This is because we only ever ran the scraping module on the website, where the page was static- always containing that table. Once it was removed, it broke the software.

```
Traceback (most recent call last):
  File "c:\Users\me\Desktop\Cosc4p02ChatbotProject-main\Chatbot\Back-End\components\executetests.py", line 30, in <module>
    provtest2 = prov2.scrape("file:///C:/users/me/desktop/testcases/province_medals/null.html", True)
  File "c:\Users\me\Desktop\Cosc4p02ChatbotProject-main\Chatbot\Back-End\components\scraping\modules\province_medals.py", line 80, in scrape
    'Province Name': provinceName,
UnboundLocalError: local variable 'provinceName' referenced before assignment
```

This was especially troubling because the 2022 Canada Games website has a lot of blank and null information, if this wasn't fixed launching this software on the most recent websites may lead to modules breaking.

While we wished to use a more sophisticated testing framework for automated testing, when we first started doing our own manuals tests- such as the tests on province medals, we had to go back and debug, fix, and refactor code. The time we set aside for testing was insufficient, as we quickly realized we weren't solely testing working software, but also fixing and refactoring it as we progressed. While our group wishes we had dedicated more time to testing, this lesson- and introduction to testing- has taught us a lot. Our members are now very familiar with how much time you should truly dedicate to testing, appreciating the absolute necessity for it.



The approach we had for constructing scraping all athletes and teams lead to identical ERD diagrams. Firstly, we have AthleteScrape and TeamScrape which are responsible for scraping all teams/athlete GUIDs on their respective pages. Upon constructing this list of GUIDs, we pass these GUIDs to their respective individual page scraper. There were over 4700 athletes, and over 450 teams. By using similar templates and executing this upon so many records, we were effectively continuously testing as we progressed.

Because of this, when we constructed our custom HTML files we didn't encounter any failed cases. This is because we had already encountered a wide array of empty, missing, and null fields, whereby we reduced our testing time- and ensured four classes had been extensively tested by properly using abstraction.

9. SPRINTS

9.1. Meetings

All members of our team are present for meetings, as it is vital to get everyone's input and expertise. We hold formal meetings twice a week and communicate throughout the week over a dedicated Discord Server/Microsoft Teams chat.

9.2. Sprints

Miro was used for tracking user stories and planning sprints. It can be accessed at:
https://miro.com/app/board/uXjVOVYcNxA=/

Within a sprint, team members would choose activities to contribute to, moving the sprint forward and iteratively building the application. Team members chose their activities for the sprints, and we will include individual names next to the activities they worked on. Our team has opted to use Miro.com to visualize our sprints, as well as keep track of the progress/-completed tasks, and can be viewed by clicking on the "Sprint Backlog" link at the end of this document in Section 6.

The Tasks for the Sprints during this period were focused on creating Administration modules to monitor the website/chatbot, and creating test cases for the system.

9.2.1. Sprint 5

• Create a Testing Framework

• Link Scraping Scripts with SQL Manager

• Convert text data communication to JSON

• Implement multi-threaded AI

• Create a 404 Page

• Create an Admin Page

• Add Login System for Damin on Front End

• Add capability to show extra info for an AI's response

• Add an indication if server is live or not

• Change font size/theme button

• A message indicating that were scraping answers, and therefore aren't responsible for what's provided to them

• Create dashboard to see latest state of the server, data and info

9.2.2. Sprint 6

• Create Test Cases for AI

• Create Test Cases for SQL Database

• Create Test Cases for Front End

• Create Test Cases for Scraping

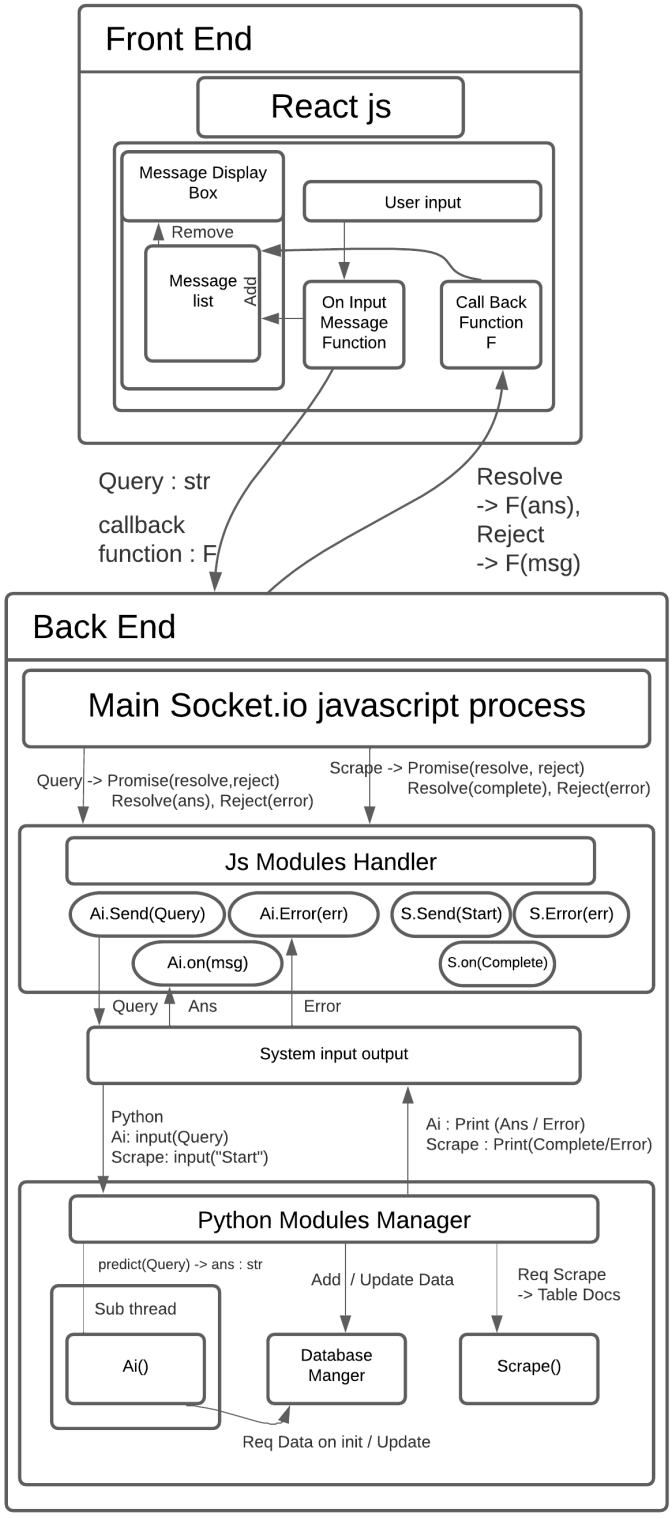
• Create Video for the Demonstration of the Software

• Create Verification System for Admin Credentials on the Back-End

• Create a method to view data scraped

• Create a method in Back-End to get latest updates on server component's state

10. System Diagram

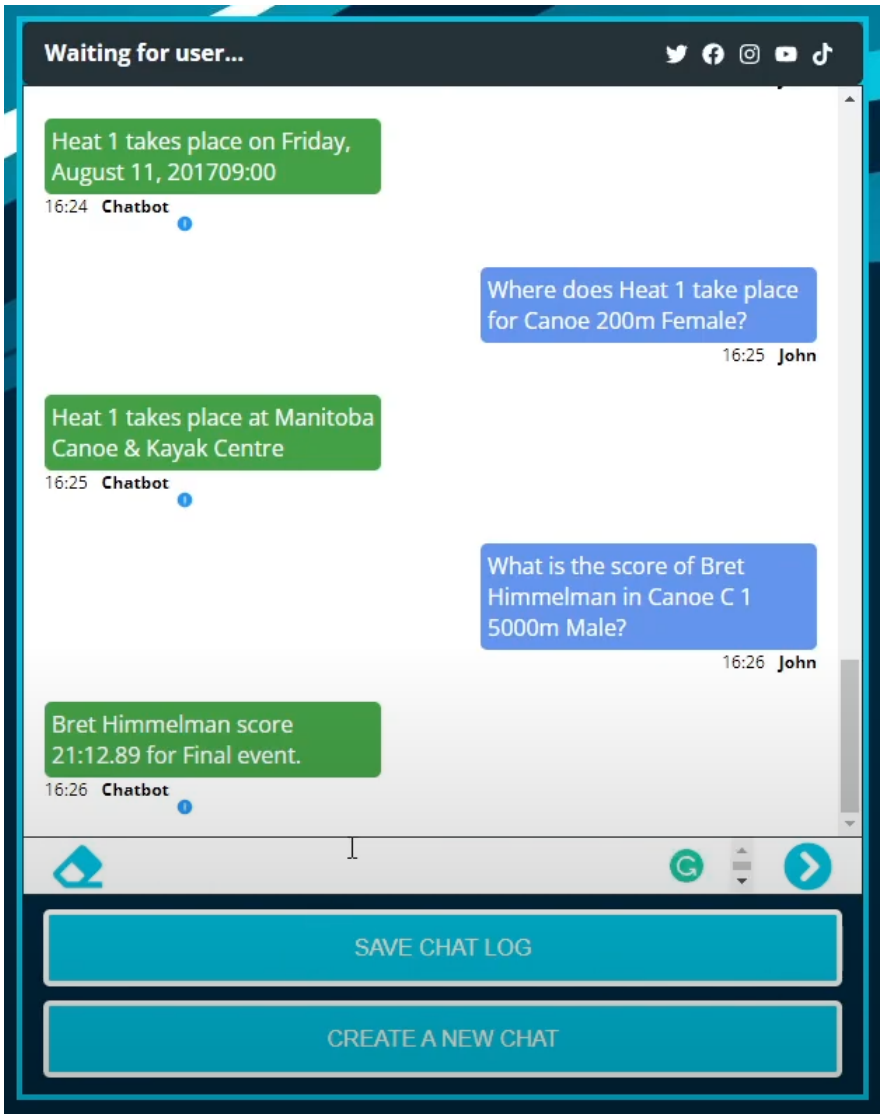


11. UPDATES

After our final presentation we attempted to fix some of the concerns the product owners brought to our attention regarding our AI responses as much as possible.

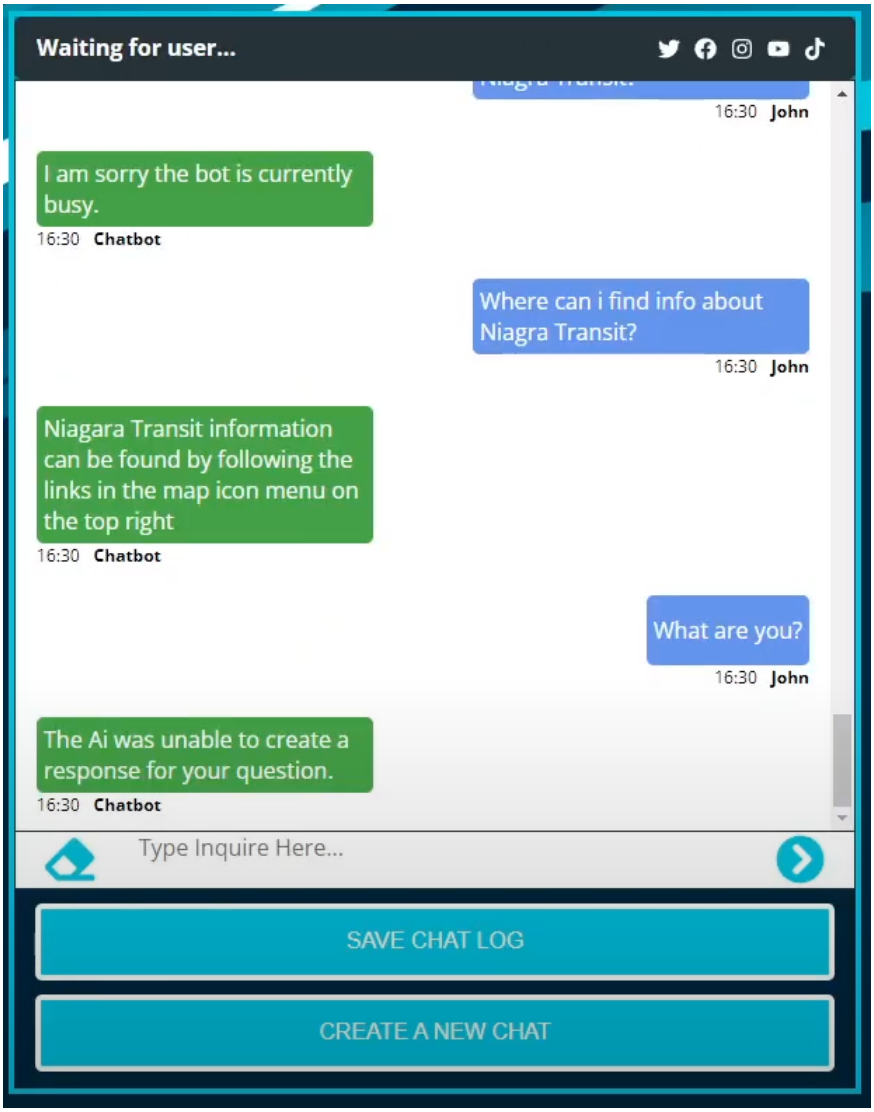
11.1. Meaningful response

During the final presentation the biggest issue was inappropriate response and direct answers instead of grammatically complete answer. An example of this can be.
Questions: What did x score in y event?
Previous Answer: z
Fixed Answer: x scored z for y event.



11.2. Random response

As recommended a threshold of 85% was added to the AI's prediction. If the answer does not meet this threshold. The user receives the following message "The AI was unable to create a response for your question".



12. LINKS

GitHub
Sprint Backlog
Haystack framework
Deepset models for retriever
Tapas model for reader
YouTube Tutorial for Software