

**NANYANG
TECHNOLOGICAL
UNIVERSITY**
SINGAPORE

SCHOOL OF MECHANICAL & AEROSPACE ENGINEERING

**MA1008 Introduction to Computational Thinking
AY2020-21 Sem 2**

Mini Project: A Badminton Ladder

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Group: MA10

Date: 15/4/2021

How to Run the Program

Initially the program file contains the following files:

- Data files: data.txt, ladder.txt
- Python program: ladder_program.py
- Ladder save states: data_12-03-2021 and ladder_12-03-2021 – these are the state of the ladder on 12-03-2021.

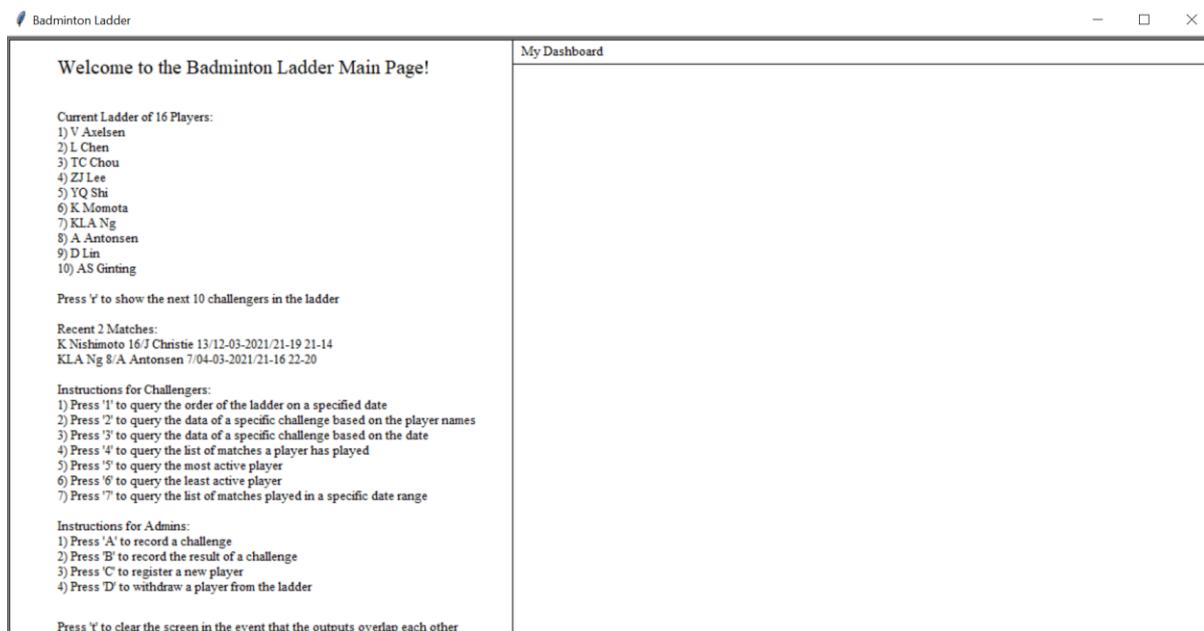
Note: The Use of Save States

The files named ladder_<DD-MM-YYYY> and data_<DD-MM-YYYY> shows the state of the ladder at the point in time at that particular date. Every time a change is made to the ladder or data file a file is created with the date appended. In this scenario when the manual physical rack is imported into the program the data and ladder save states should be created for each entry since the start of the ladder by executing the administrative functions A to D from the start with reference to the data.

**However for the purposes for this project I did not create all the save states as this will lead to the submission of many .txt files. For the demonstration of the save states I have created the data_12-03-2021 and ladder_12-03-2021 to demonstrate the querying functions. This means that queries done after 12-03-2021 will work and will work for dates before if the save state files are created.*

More information on how does this work will be shown in the demonstration.

Open the Python file - ladder_program.py with IDLE and the following graphical display appears.



The above window which first opens is the graphical display showing the following:

1. Ladder, with the first 10 players in alphabetical order
 - For the event that the ladder has more than 10 players, pressing the keyboard 'r' key will allow you to refresh the page and toggle between showing the next 10 players
 - For example, for a ladder with 25 players, the first 10 players will be displayed in the initial window. Pressing the 'r' key will show the next 10 players and pressing the 'r' key again will show the last 5 players. Pressing 'r' key once again will show the first 10 players (i.e. the first 10 players already displayed).
2. The window shows the recent 2 matches which were played below the player ladder.
3. Below which are instructions for the facilities for a player to take queries and to take administrative actions. Number keys '1' to '7' are action keys for queries and letter keys 'A' to 'D' are action keys for administrative functions.

Instructions for Challengers:

- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder"

4. Other functions:

The above keys generate a text output on the graphical display. The user can press the 't' key to clear the screen. This means that all outputs and messages will be cleared from the screen.

Data of Sequence of Runs of the Program (with Graphics Windows)

Part I: Program Administrative Functions

The initial state of the ladder and the data files are as provided. The program uses the same conventions as defined in the instructions.

The image shows three separate windows of Microsoft Notepad. The top window is titled 'ladder - Notepad' and contains a list of names and their current ranks: V Axelsen, L Chen, TC Chou, ZJ Lee, YQ Shi, K Momota, KLA Ng, A Antonsen, D Lin, AS Ginting, K Tsuneyama, KY Lee, K Nishimoto, J Christie, TW Wang, and S Praneeth. The middle window is titled 'data - Notepad' and contains a much longer list of entries, likely challenge histories, such as 'TW Wang 14/D Lin 11/07-02-2021/14-21 12-21', 'S Kidambi 13/K Tsuneyama 10/08-02-2021/21-12 23-21', and many others. The bottom window is a modal dialog titled 'Input Current Rank of Challenger' with the instruction 'Input Current Rank of Challenger. Refer to ladder for accurate input.' It has an input field containing a placeholder 'I', and two buttons at the bottom: 'OK' and 'Cancel'.

```

ladder - Notepad
File Edit Format View Help
V Axelsen
L Chen
TC Chou
ZJ Lee
YQ Shi
K Momota
KLA Ng
A Antonsen
D Lin
AS Ginting
K Tsuneyama
KY Lee
K Nishimoto
J Christie
TW Wang
S Praneeth

data - Notepad
File Edit Format View Help
TW Wang 14/D Lin 11/07-02-2021/14-21 12-21
S Kidambi 13/K Tsuneyama 10/08-02-2021/21-12 23-21
KY Lee 15/J Christie 13/09-02-2021/21-17 21-15
-S Kidambi 10/10-02-2021
ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19
YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22
A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20
K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22
R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18
V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17
D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13
K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21
ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23
K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21
V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20
K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21
TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16
KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20
-R Gemke 15/06-03-2021
+K Nishimoto/09-03-2021
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14

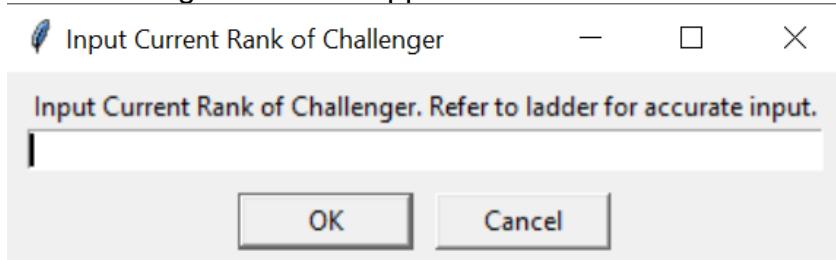
```

(for the data files the last few lines of the data file is shown above.)

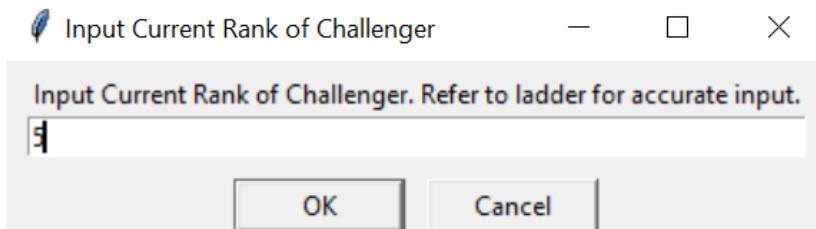
I will first demonstrate the administrative functions of the program.

Recording a Challenge and Recording the Result of the Challenge

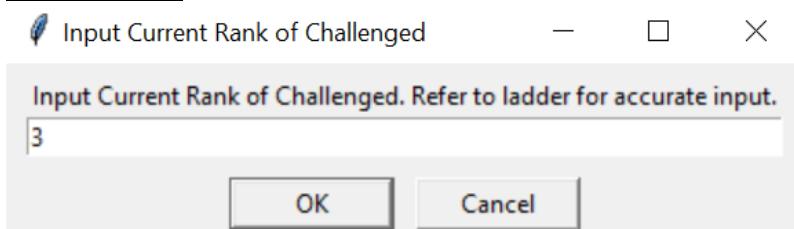
1. Press the 'A' key to prompt the program that you want to record a challenge.
2. The following textbox will appear.



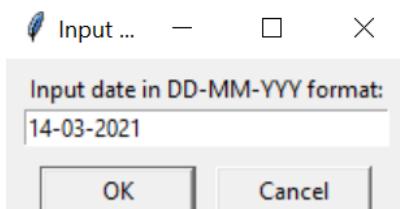
3. You can use the ladder display to find the ranks of the players in which are in the match.
4. In this example, YQ Shi will challenge TC Chou.
5. First enter the rank of the challenger. In this case we enter 5, the rank of YQ Shi.



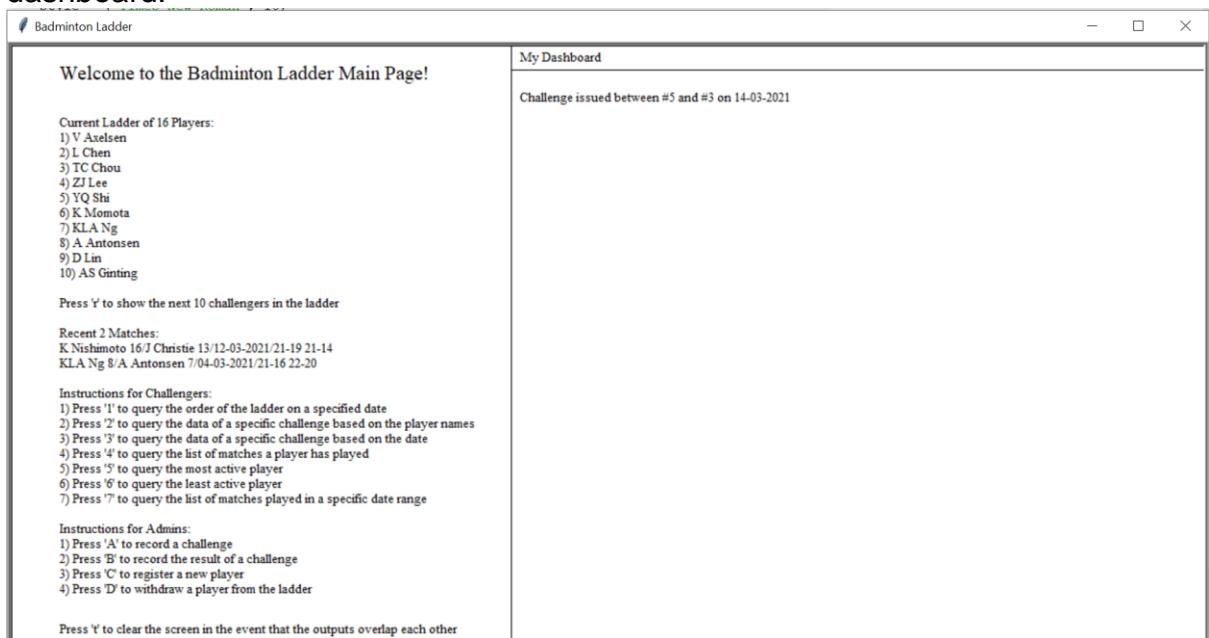
6. After input, the next text box will appear. You can then enter the rank of the challenged. In this case we enter 3, which is the rank TC Chou.



7. Input the date that the match was played.



8. After this a challenge is successfully recorded and is reflected on the dashboard.



9. This will also be reflected in the data file. (See the last line)

data - Notepad

File Edit Format View Help

S Kidambi 13/K Tsuneyama 10/08-02-2021/21-12 23-21
KY Lee 15/J Christie 13/09-02-2021/21-17 21-15
-S Kidambi 10/10-02-2021
ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19
YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22
A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20
K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22
R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18
V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17
D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13
K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21
ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23
K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21
V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20
K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21
TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16
KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20
-R Gemke 15/06-03-2021
+K Nishimoto/09-03-2021
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14
YQ Shi 5/TC Chou 3/14-03-2021/

We see in the file which contains the program, a new text file `data_14-03-2021` is created.

File	Name	Last Modified	Type	Size
📄	data	14/4/2021 22:55	Text Document	2 KB
📄	data_12-03-2021	24/3/2021 23:43	Text Document	2 KB
📄	data_14-03-2021	14/4/2021 22:55	Text Document	2 KB
📄	ladder	24/3/2021 23:42	Text Document	1 KB
📄	ladder_12-03-2021	24/3/2021 23:42	Text Document	1 KB
🐍	ladder_program	14/4/2021 22:40	Python File	23 KB

When we open the file data_14-03-2021, you can see that the file is exactly the same as the data file. **This will be referred to my program and this report as a save state**, which shows the state of the data or ladder at that specific date shown on the file name. This is one of the key mechanisms which the program relies on to query information and also serves as a fallback in the event of any error or corruption of files. (This is a benefit that will be elaborated in the strengths and limitations of the report.)

The screenshot shows a Notepad window with the following content:

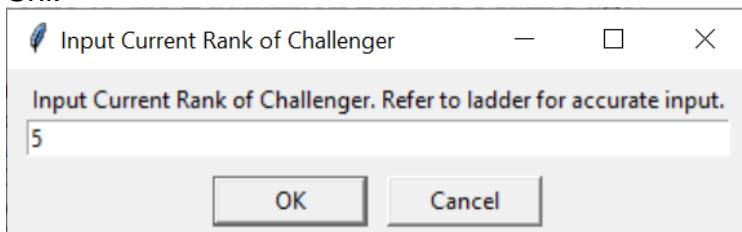
```

data_14-03-2021 - Notepad
File Edit Format View Help
S Kidambi 13/K Tsuneyama 10/08-02-2021/21-12 23-21
KY Lee 15/J Christie 13/09-02-2021/21-17 21-15
-S Kidambi 10/10-02-2021
ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19
YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22
A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20
K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22
R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18
V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17
D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13
K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21
ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23
K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21
V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20
K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21
TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16
KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20
-R Gemke 15/06-03-2021
+K Nishimoto/09-03-2021
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14
YQ Shi 5/TC Chou 3/14-03-2021/

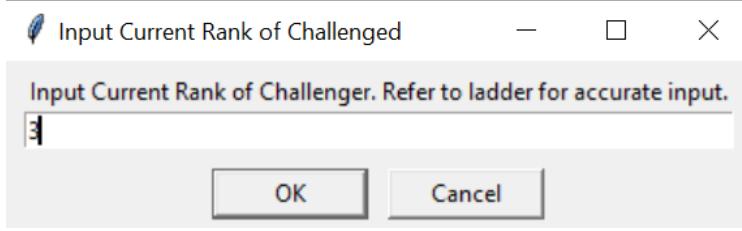
```

Notable features of the Notepad window include a status bar at the bottom showing 'Ln 1, Col 1' and zoom levels from 100% to 400%, along with encoding options for Windows (CRLF) and UTF-8.

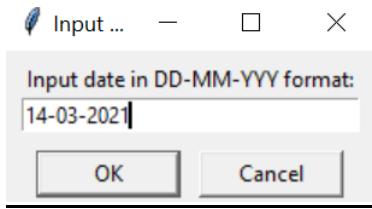
10. Now we will record the result of a challenge. We assume that YQ Shi wins the match, with a result of 21-17 21-15.
11. We press the 'B' key to record a challenge. We input 5, which is the rank of YQ Shi.



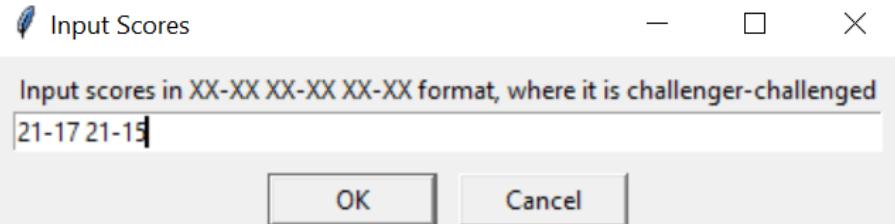
12. Next, we input the rank of TC Chou which is 3.



13. Next, we input the date which the match was played, which is the same date which you have input when you issued the challenge, which 14-03-2021.



14. We now input the scores. We input the scores in the XX-XX format, and separated by spaces for each match that was played.



15. We see now that the ladder file is now updated with the results of the challenge, with YQ Shi being in 3rd place above TC Chou, and the rest of the players moving down a place.

```

ladder - Notepad
File Edit Format View Help
V Axelsen
L Chen
YQ Shi
TC Chou
ZJ Lee
K Momota
KLA Ng
A Antonsen
D Lin
AS Ginting
K Tsuneyama
KY Lee
K Nishimoto
J Christie
TW Wang
S Praneeth

```

16. The dashboard shows a message to show that the change has successfully been made.

<p>Welcome to the Badminton Ladder Main Page!</p> <p>Current Ladder of 16 Players:</p> <ul style="list-style-type: none"> 1) V Axelsen 2) L Chen 3) TC Chou 4) ZJ Lee 5) YQ Shi 6) K Momota 7) KLA Ng 8) A Antonsen 9) D Lin 10) AS Ginting <p>Press 'Y' to show the next 10 challengers in the ladder</p> <p>Recent 2 Matches:</p> <ul style="list-style-type: none"> K Nishimoto 15 / J Christie 13 / 12-03-2021 / 21-19 21-14 KLA Ng 8 / A Antonsen 7 / 04-03-2021 / 21-16 22-20 <p>Instructions for Challengers:</p> <ol style="list-style-type: none"> 1) Press '1' to query the order of the ladder on a specified date 2) Press '2' to query the data of a specific challenge based on the player names 3) Press '3' to query the data of a specific challenge based on the date 4) Press '4' to query the list of matches a player has played 5) Press '5' to query the most active player 6) Press '6' to query the least active player 7) Press '7' to query the list of matches played in a specific date range <p>Instructions for Admins:</p> <ol style="list-style-type: none"> 1) Press 'A' to record a challenge 2) Press 'B' to record the result of a challenge 3) Press 'C' to register a new player 4) Press 'D' to withdraw a player from the ladder <p>Press 'Y' to clear the screen in the event that the outputs overlap each other</p>	<p>My Dashboard</p> <p>Result recorded for challenge between #5 and #3 on 14-03-2021</p>
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17. The data file now reflects the results of the challenge.

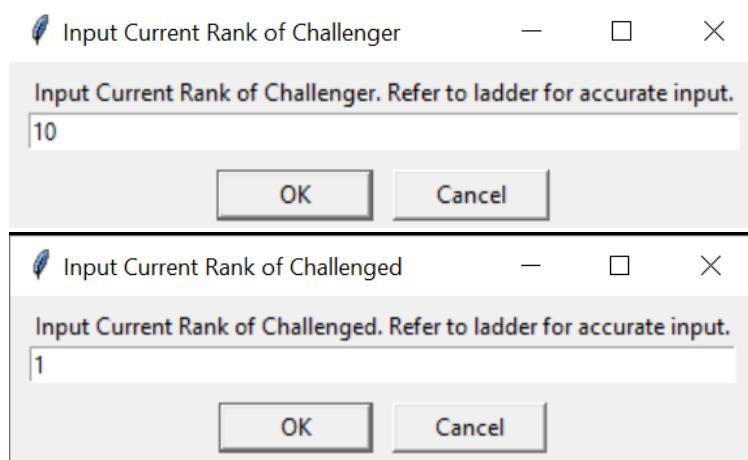
The screenshot shows a Notepad window with the title 'data - Notepad'. The content of the file is a list of player names and their details, separated by commas. The list includes: S Kidambi 13/K Tsuneyama 10/08-02-2021/21-12 23-21, KY Lee 15/J Christie 13/09-02-2021/21-17 21-15, -S Kidambi 10/10-02-2021, ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19, YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22, A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20, K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22, R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18, V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17, D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13, K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21, ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23, K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21, V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20, K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21, TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16, KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20, -R Gemke 15/06-03-2021, +K Nishimoto/09-03-2021, K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14, YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15.

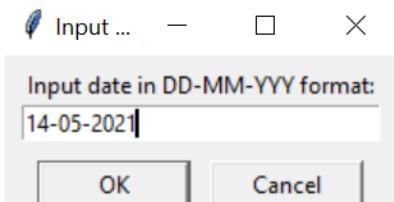
18. The save states are also created.

data	14/4/2021 22:56	Text Document	2 KB
data_12-03-2021	24/3/2021 23:43	Text Document	2 KB
data_14-03-2021	14/4/2021 22:56	Text Document	2 KB
ladder	14/4/2021 22:56	Text Document	1 KB
ladder_12-03-2021	24/3/2021 23:42	Text Document	1 KB
ladder_14-03-2021	14/4/2021 22:56	Text Document	1 KB
ladder_program	14/4/2021 22:40	Python File	23 KB

19. Note that a player on the ladder may challenge another player up to three places above. A challenge to players beyond three places above is forbidden. In the event that forbidden challenge is issued (i.e. challenge beyond 3 places or a player challenging another player with lower rank than her/him, the challenge will not be recorded.

In the event that a forbidden challenge is issued, there will be no change made to the data file and no save states will be created.





We see below that with a forbidden challenge there is no transaction recorded in the data file. The dashboard displays a output showing that a forbidden challenge was made.

Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

- 1) V Axelsen
- 2) L Chen
- 3) TC Chou
- 4) ZJ Lee
- 5) YQ Shi
- 6) K Momota
- 7) KLA Ng
- 8) A Antonsen
- 9) D Lin
- 10) AS Ginting

Press 'Y' to show the next 10 challengers in the ladder

Recent 2 Matches:

- K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14
- KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20

Instructions for Challengers:

- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder

Press 'Y' to clear the screen in the event that the outputs overlap each other

```

File Edit Format View Help
S Kidambi 13/K Tsuneyama 10/08-02-2021/21-12 23-21
KY Lee 15/J Christie 13/09-02-2021/21-17 21-15
-S Kidambi 10/10-02-2021
ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19
YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22
A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20
K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22
R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18
V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17
D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13
K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21
ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23
K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21
V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20
K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21
TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16
KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20
-R Gemke 15/06-03-2021
+K Nishimoto/09-03-2021
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14
YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15

```

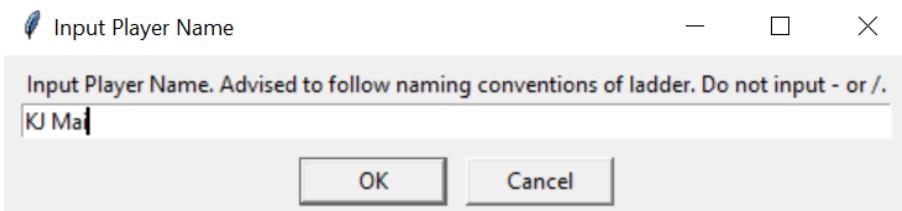
Note: A challenge must first be issued through admin function 1 before the result can be recorded using admin function 2.

Program Response to Erroneous Input:

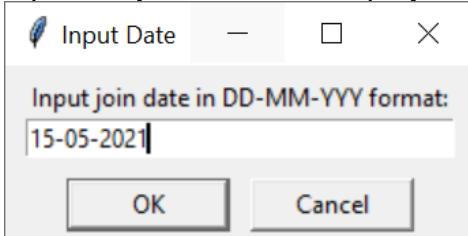
If a result is recorded for a challenge that has not been created/ or does not exist, the ladder will record a correct change in ranking but no data will be recorded in the data file. Issuing a challenge and then recording the result is important to get the correct data file.

Registering a New Player

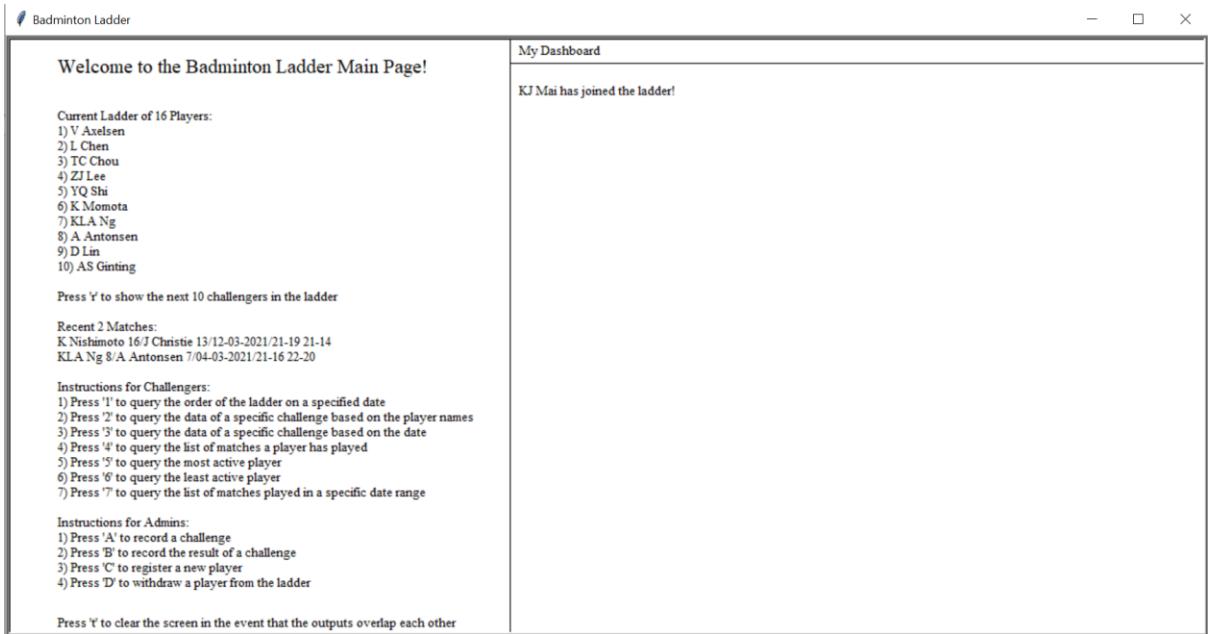
1. Press the ‘C’ key to register a new player. It is important not to put the characters “–” or “/” in the player name as this will lead to errors in the program.



2. Input the join date for the player.



3. The dashboard displays a message that a player has been successfully added. We see that the new player appears on the ladder file and a new save state is created. The data file also reflects this transaction.



The image shows three windows from Microsoft Notepad:

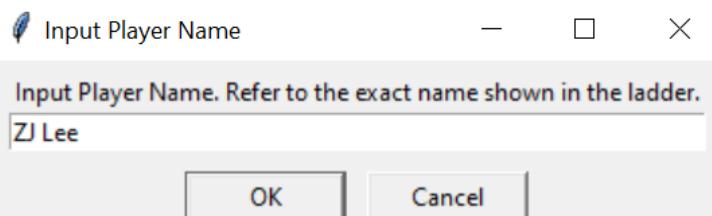
- ladder - Notepad**: Contains a list of names: V Axelsen, L Chen, YQ Shi, TC Chou, ZJ Lee, K Momota, KLA Ng, A Antonsen, D Lin, AS Ginting, K Tsuneyama, KY Lee, K Nishimoto, J Christie, TW Wang, S Praneeth, KJ Mai.
- data - Notepad**: Contains a list of player statistics and dates, such as KY Lee 15/J Christie 13/09-02-2021/21-17 21-15, -S Kidambi 10/10-02-2021, etc.
- File Explorer**: Shows a list of files in the 'data' folder:

data	14/4/2021 22:59	Text Document	3 KB
data_12-03-2021	24/3/2021 23:43	Text Document	2 KB
data_14-03-2021	14/4/2021 22:56	Text Document	2 KB
data_15-05-2021	14/4/2021 22:59	Text Document	3 KB
ladder	14/4/2021 22:59	Text Document	1 KB
ladder_12-03-2021	24/3/2021 23:42	Text Document	1 KB
ladder_14-03-2021	14/4/2021 22:56	Text Document	1 KB
ladder_15-05-2021	14/4/2021 22:59	Text Document	1 KB
ladder_program	14/4/2021 22:40	Python File	23 KB

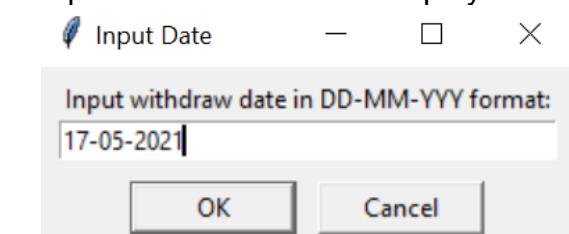
Withdrawing a Player from the Ladder

We are going to remove ZJ Lee from the ladder.

1. Press the 'D' key to withdraw the player from the ladder. It is important to key the name exactly as shown.



2. Input the date in which the player withdraws from the ladder.



3. The dashboard shows that the player has been successfully withdrawn from the ladder. We see that ZJ Lee is no longer in the ladder and the transaction is recorded in the data file. The save state for this date is also created.

The image shows two windows side-by-side. The left window is the "Badminton Ladder Main Page" with the title "Welcome to the Badminton Ladder Main Page!". It displays a ladder of 16 players with ZJ Lee listed. The right window is "My Dashboard" with the message "ZJ Lee has been withdrawn from the ladder."

Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

- 1) V Axelsen
- 2) L Chen
- 3) TC Chou
- 4) ZJ Lee
- 5) YQ Shi
- 6) K Momota
- 7) KLA Ng
- 8) A Antonsen
- 9) D Lin
- 10) AS Ginting

Press 'Y' to show the next 10 challengers in the ladder

Recent 2 Matches:
K Nishimoto 16/2 Christie 13/12-03-2021/21-19 21-14
KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20

Instructions for Challengers:

- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder

Press 'Y' to clear the screen in the event that the outputs overlap each other

My Dashboard

ZJ Lee has been withdrawn from the ladder.

 ladder - Notepad

File Edit Format View Help

```
V Axelsen
L Chen
YQ Shi
TC Chou
K Momota
KLA Ng
A Antonsen
D Lin
AS Ginting
K Tsuneyama
KY Lee
K Nishimoto
J Christie
TW Wang
S Praneeth
KJ Mai
```

 data - Notepad

File Edit Format View Help

```
-S Kidambi 10/10-02-2021
ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19
YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22
A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20
K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22
R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18
V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17
D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13
K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21
ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23
K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21
V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20
K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21
TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16
KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20
-R Gemke 15/06-03-2021
+K Nishimoto/09-03-2021
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14
YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15
+KJ Mai/15-05-2021
-ZJ Lee 5/17-05-2021
```

	Ln 1, Col 1	100%	Windows (CRLF)	UTF-8
 data	14/4/2021 23:02		Text Document	3 KB
 data_12-03-2021	24/3/2021 23:43		Text Document	2 KB
 data_14-03-2021	14/4/2021 22:56		Text Document	2 KB
 data_15-05-2021	14/4/2021 22:59		Text Document	3 KB
 data_17-05-2021	14/4/2021 23:02		Text Document	3 KB
 ladder	14/4/2021 23:02		Text Document	1 KB
 ladder_12-03-2021	24/3/2021 23:42		Text Document	1 KB
 ladder_14-03-2021	14/4/2021 22:56		Text Document	1 KB
 ladder_15-05-2021	14/4/2021 22:59		Text Document	1 KB
 ladder_17-05-2021	14/4/2021 23:02		Text Document	1 KB
 ladder_program	14/4/2021 22:40		Python File	23 KB

Program Response to Erroneous Input:

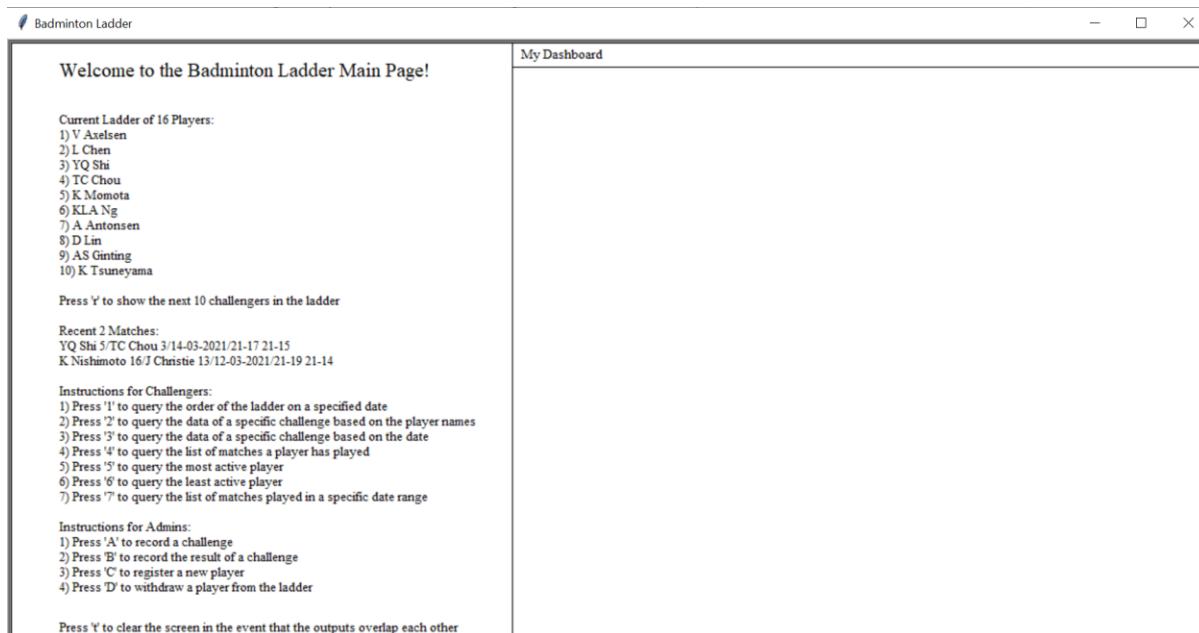
In the event where a user withdraws a player from the ladder that does not exist, the program will not register an input and no changes will be done to any files (including the fact that a save state will not be created).

Now you can close the program so the changes will be reflected on the display and the query functions will reflect the most updated changes.

Part II: Program Query Functions

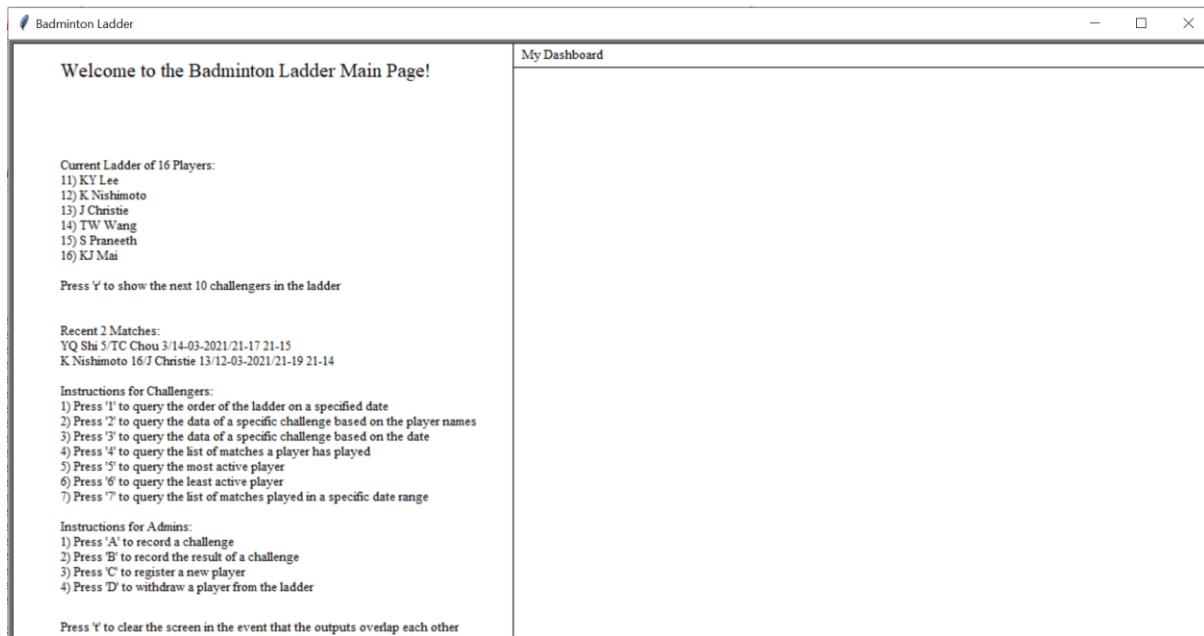
I will move on to demonstrate the query functions of the program.
Reopen the program ladder_program.py using IDLE.

We see that in the homepage the most recent match between YQ Shi and TC Chou has been shown in the “Recent 2 Matches” part of the page.

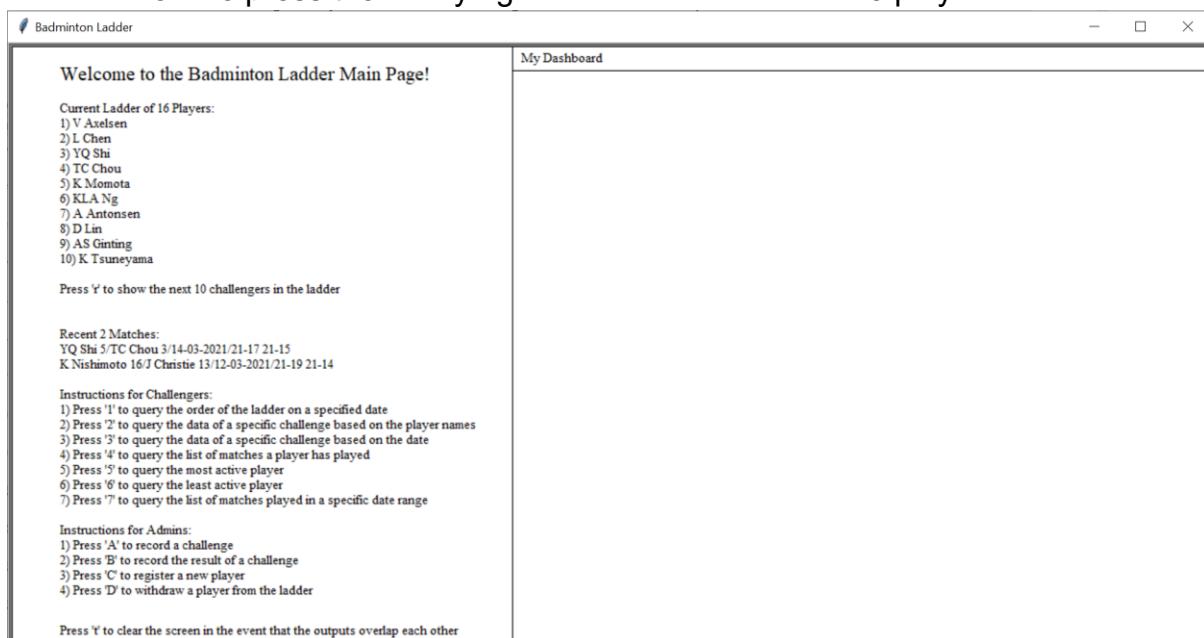


We see that the current ladder states to have 16 players due to the addition of 1 player and withdrawal of 1 player. We cannot see the new player added “KJ Mai” as it is the 16th player and the ladder display only shows players in sets of 10.

1. Press the ‘r’ key to show the next 6 players in the ladder.



2. When we press the 'r' key again we can see the first 10 players in the ladder.



3. Repeatedly pressing 'r' will allow the user to toggle to view all the players in the ladder.

Query the Order of the Ladder on a specified date

We recall that the changes to the ladder are done as follows:

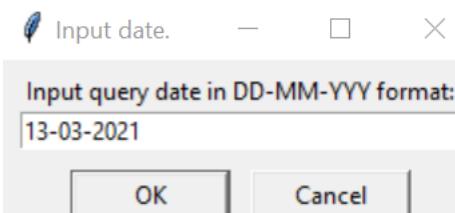
Date	Change
14-03-2021	<i>Challenge and Result between YQ Shi and TC Chou</i>
15-05-2021	<i>Addition of Player KJ Mai</i>
17-05-2021	<i>Withdrawal of Player ZJ Lee</i>

*The italicised changes were made to demonstrate the program

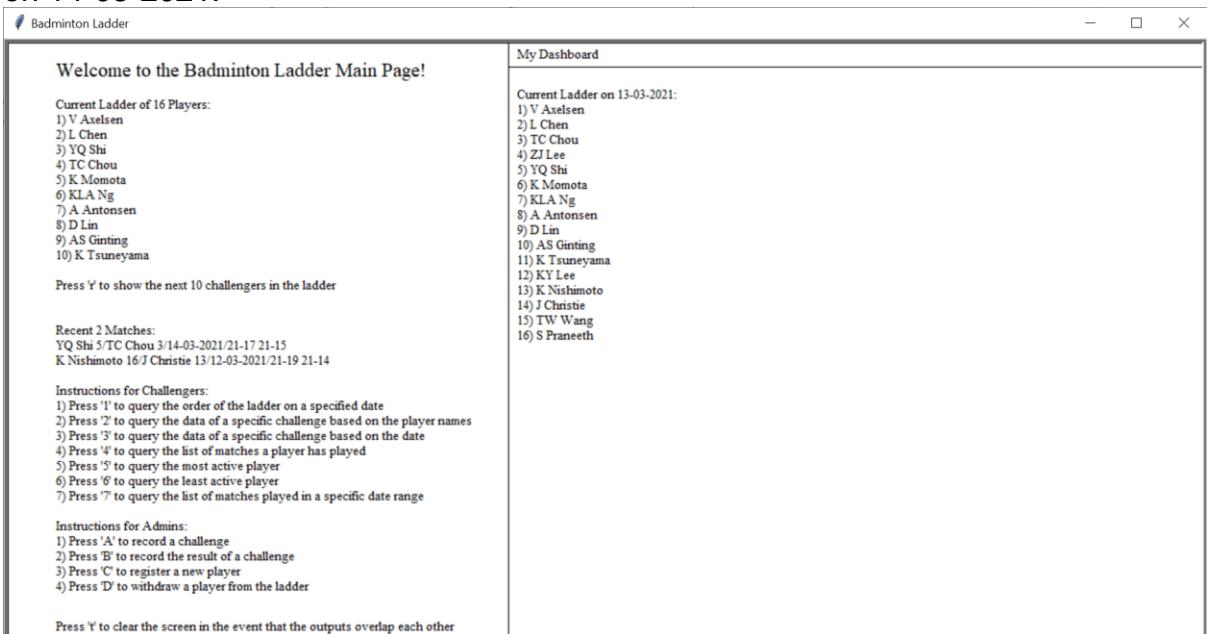
If we query on a date before 22-12-2020, it will show the initial state of the ladder since there were no changes made before this date.

Note: When the data is being imported, the changes from 22-12-2020 to 12-03-2021 will have to be input into the program through the administrative functions mentioned above to generate the save states so that querying the ladder state before 12-03-2021 will give the desired output. However, for the purposes for this project (to prevent the submission of too many text files), I will demonstrate the queries on and after 12-03-2021 to demonstrate that the program works. The data files data_12-03-2021.txt and ladder_12-03-2021.txt were created to demonstrate this functionality. This demonstration shows that this querying of ladder works.

1. Press the “1” key to query the ladder on 13-03-2021



2. We see that the query gives the state of the ladder before the changes, with YQ Shi in 5th place and TC Chou in 3rd place, their placing before their match on 14-03-2021.



Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

1) V Axelsen	2) L Chen	3) TC Chou	4) ZJ Lee
5) K Momota	6) KLA Ng	7) YQ Shi	8) A Antonsen
9) D Lin	10) AS Ginting	11) K Tsuneyama	12) KY Lee
13) K Nishimoto	14) J Christie	15) TW Wang	16) S Praneeth
15) TW Wang	16) S Praneeth		

Press 'Y' to show the next 10 challengers in the ladder

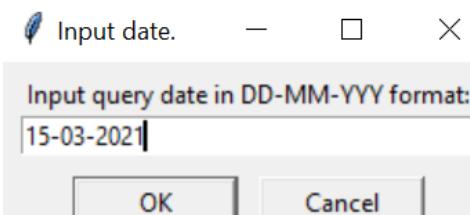
Recent 2 Matches:
YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14

Instructions for Challengers:
1) Press '1' to query the order of the ladder on a specified date
2) Press '2' to query the data of a specific challenge based on the player names
3) Press '3' to query the data of a specific challenge based on the date
4) Press '4' to query the list of matches a player has played
5) Press '5' to query the most active player
6) Press '6' to query the least active player
7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:
1) Press 'A' to record a challenge
2) Press 'B' to record the result of a challenge
3) Press 'C' to register a new player
4) Press 'D' to withdraw a player from the ladder

Press 'Y' to clear the screen in the event that the outputs overlap each other

3. Press “1” to query the ladder on 15-03-2021



4. We see that the query shows that state of the ladder on 15-03-2021. We see that the queried ladder reflects the outcome of YQ Shi winning TC Chou.

Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

- 1) V Axelsen
- 2) L Chen
- 3) YQ Shi
- 4) TC Chou
- 5) K Momota
- 6) KLA Ng
- 7) A Antonsen
- 8) D Lin
- 9) AS Ginting
- 10) K Tsuneyama
- 11) K Tsuneyama
- 12) KY Lee
- 13) K Nishimoto
- 14) J Christie
- 15) TW Wang
- 16) S Praneeth

Press 'Y' to show the next 10 challengers in the ladder

Recent 2 Matches:
YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14

Instructions for Challengers:

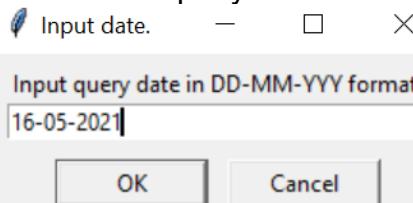
- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder

Press 'Y' to clear the screen in the event that the outputs overlap each other

5. Press "1" to query the ladder on 16-05-2021.



6. We see that the ladder reflects the addition of the new player "KJ Mai" which was added on 15-05-2021.

Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

- 1) V Axelsen
- 2) L Chen
- 3) YQ Shi
- 4) TC Chou
- 5) K Momota
- 6) KLA Ng
- 7) A Antonsen
- 8) D Lin
- 9) AS Ginting
- 10) K Tsuneyama
- 11) K Tsuneyama
- 12) KY Lee
- 13) K Nishimoto
- 14) J Christie
- 15) TW Wang
- 16) S Praneeth
- 17) KJ Mai

Press 'Y' to show the next 10 challengers in the ladder

Recent 2 Matches:
YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15
K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14

Instructions for Challengers:

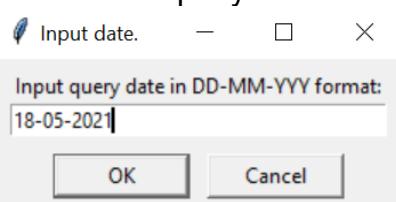
- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder

Press 'Y' to clear the screen in the event that the outputs overlap each other

7. Press "1" to query the ladder on 18-05-2021.



8. We see that the queried ladder reflects the removal of “ZJ Lee”

Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

- 1) V Axelsen
- 2) L Chen
- 3) YQ Shi
- 4) TC Chou
- 5) K Momota
- 6) KLA Ng
- 7) A Antonsen
- 8) D Lin
- 9) AS Ginting
- 10) K Tsuneyama

Press 'Y' to show the next 10 challengers in the ladder

Recent 2 Matches:

- YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15
- K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14

Instructions for Challengers:

- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder

Press 'Y' to clear the screen in the event that the outputs overlap each other

Query the data of a specific challenge based on the player names

1. Press “2” to query the data of a specific challenge based on the player names (we need to know the challenged and challenger player names to do this)

File Edit Format View Help

-S Kidambi 10/10-02-2021

ZJ Lee 6/TC Chou 4/11-02-2021/21-19 20-22 21-19

YQ Shi 2/L Chen 1/12-02-2021/18-21 21-17 20-22

A Antonsen 9/KLA Ng 7/15-02-2021/12-21 22-20 22-20

K Momota 6/V Axelsen 3/16-02-2021/18-21 21-19 24-22

R Gemke 16/S Praneeth 15/18-02-2021/12-21 21-18 21-18

V Axelsen 4/K Momota 3/20-02-2021/21-19 21-17

D Lin 11/AS Ginting 9/21-02-2021/21-16 21-13

K Tsuneyama 11/KLA Ng 8/22-02-2021/18-21 21-18 16-21

ZJ Lee 5/YQ Shi 2/24-02-2021/21-16 25-23

K Momota 5/YQ Shi 3/25-02-2021/18-21 19-21

V Axelsen 4/L Chen 1/28-02-2021/21-19 21-23 22-20

K Tsuneyama 11/D Lin 9/01-03-2021/21-17 22-24 16-21

TC Chou 6/ZJ Lee 3/02-03-2021/21-19 21-16

KLA Ng 8/A Antonsen 7/04-03-2021/21-16 22-20

-R Gemke 15/06-03-2021

+K Nishimoto/09-03-2021

K Nishimoto 16/J Christie 13/12-03-2021/21-19 21-14

YQ Shi 5/TC Chou 3/14-03-2021/21-17 21-15

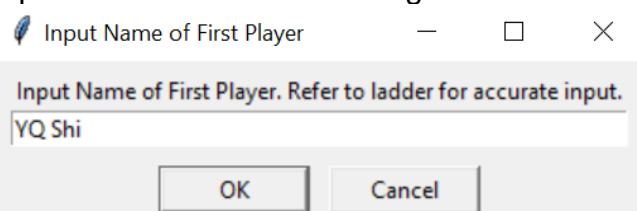
+KJ Mai/15-05-2021

-ZJ Lee 5/17-05-2021

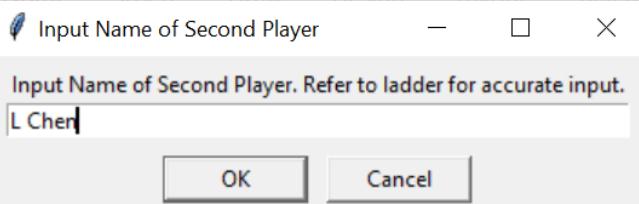
Above is the data file at this point (truncated).

We want to query the match between YQ Shi and L Chen.

2. Input the name of the challenger.



3. Input the name of the challenged.



4. The ladder displays all the challenges between YQ Shi and L Chen. Players will have to look from the list the date to know the specific challenge they are looking out for.

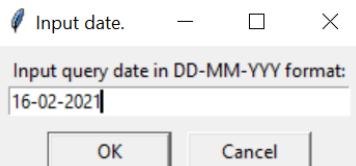
Query the data of a specific challenge based on the date

1. Press “3” to query the data of a specific challenge based on the date.

Above is the data file at this point (truncated).

We want to query the match between YQ Shi and L Chen on K Momota and V Axelsen on 16-02-2021.

2. Input the date of the match.

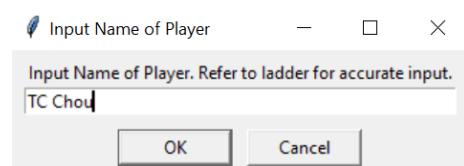


3. We see that the dashboard shows the challenges on 16-02-2021 and we see a challenge between K Momota and V Axelsen.

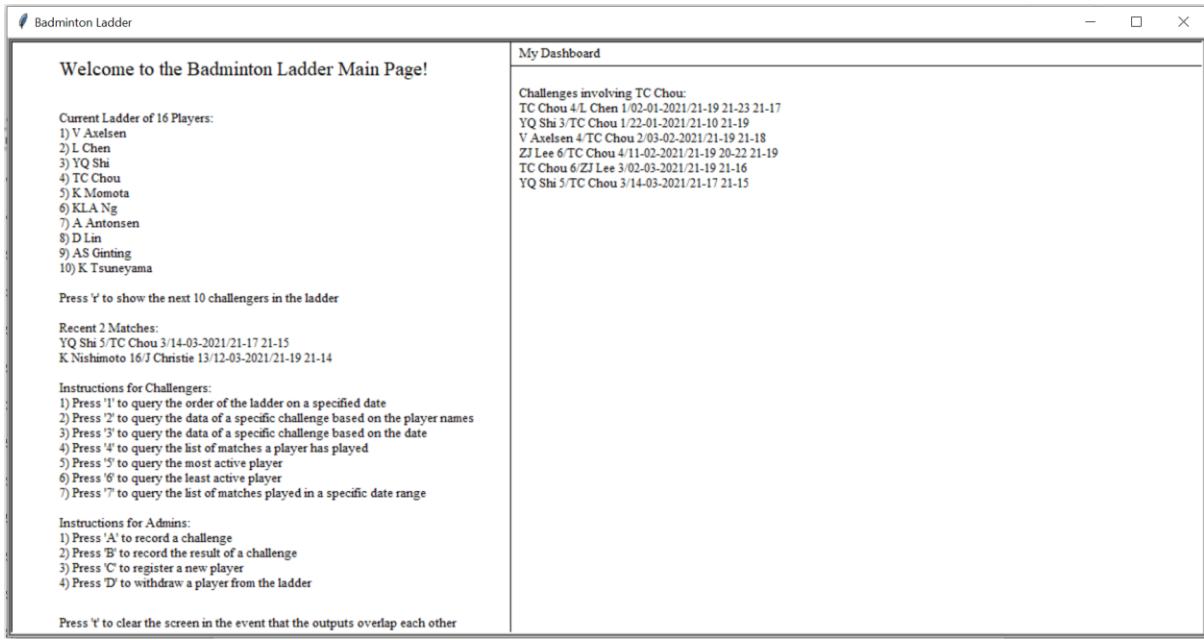
A screenshot of the Badminton Ladder application's main page. The left panel displays the current ladder with 16 players, including V Axelsen at the top. The right panel, titled "My Dashboard", shows challenges for February 16, 2021, specifically a challenge between K Momota and V Axelsen.

Query the List of Matches a Player has played

1. Press '4' to query the list of matches a player has played.
2. Input the name of the player. Refer to the ladder if required for accurate spelling of the name.

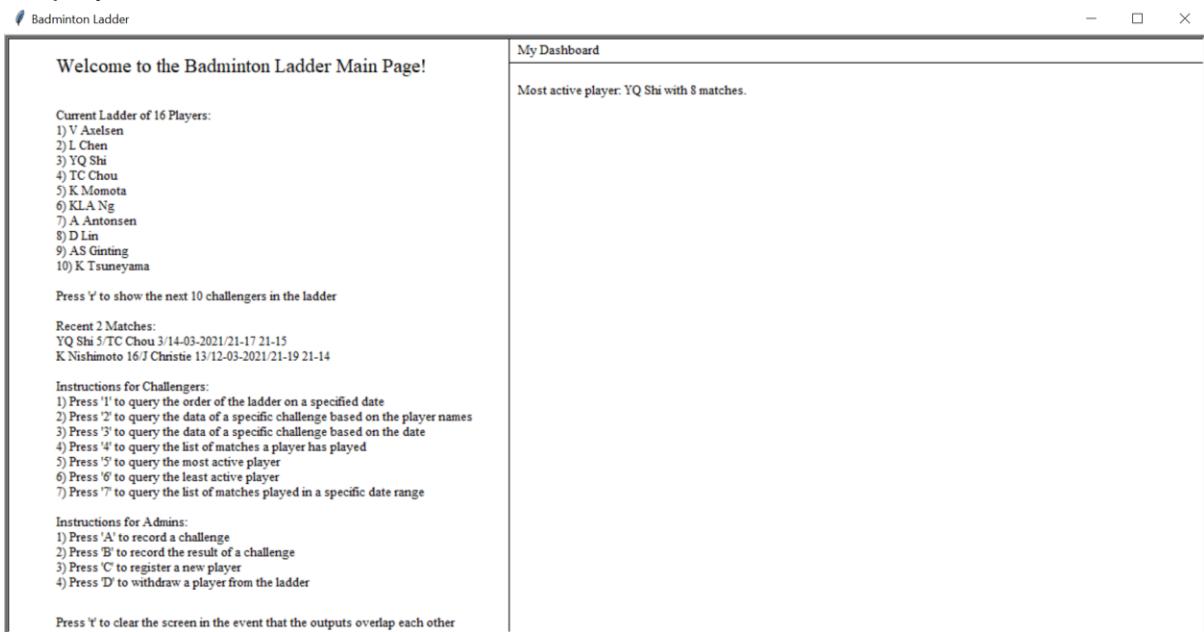


3. We see that the dashboard shows the list of matches TC Chou has played.



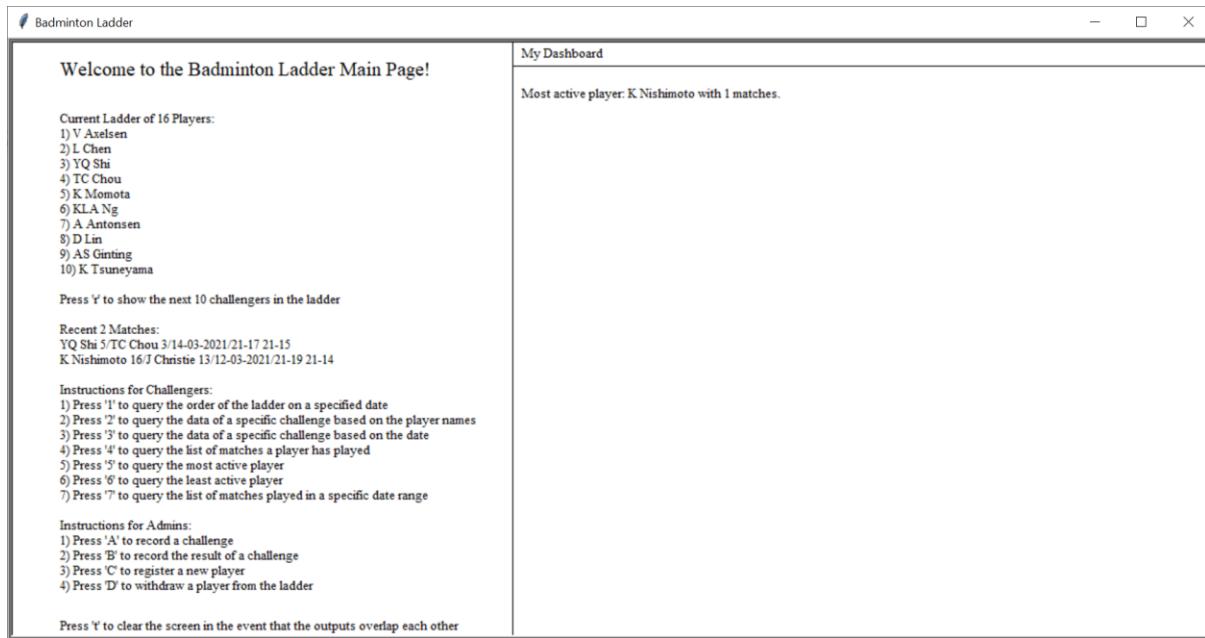
Query the Most Active Player

1. Press '5' to query the most active player.
2. The dashboard displays the most active player to be YQ Shi with 8 matches played.



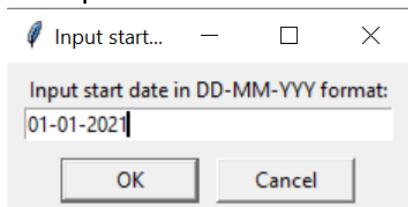
Query the Most Active Player

1. Press '6' to query the least active player.
2. The dashboard displays the most active player to be K Nishimoto with 1 match played.

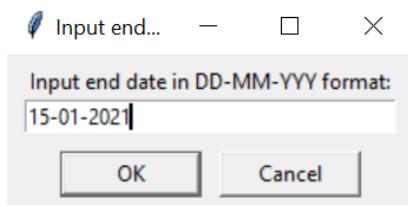


Query the list of matches played in a specific date range

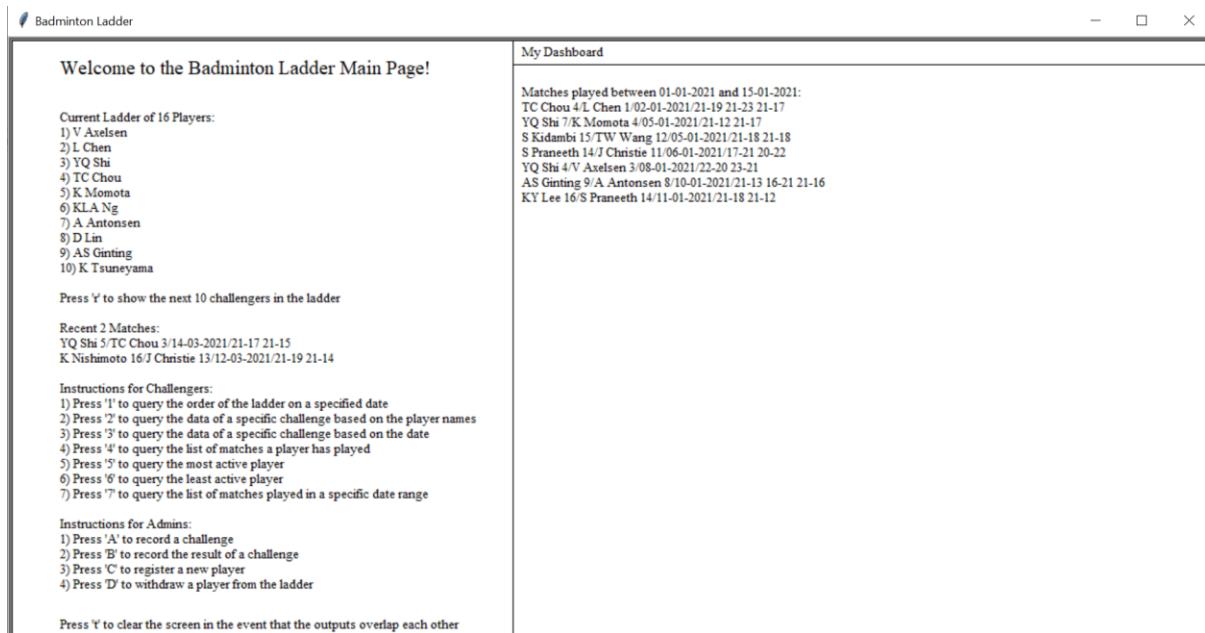
1. Press '7' to query the list of matches played in a specific date range.
2. Input the start date which you want to query.



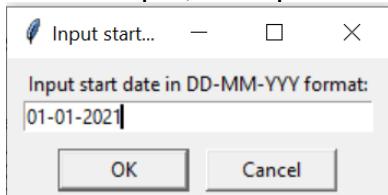
3. Input the end date of the date range which you want to query.



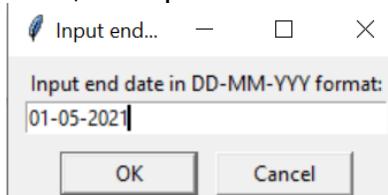
4. The dashboard shows the various matches that are played within the date range specified.



5. The program also handles the exception that the query size is too big and the dates are too many to be displayed for the dashboard. This is useful when the data size of the badminton ladder becomes too big with use.
6. For example, we input the start date to be 01-01-2021.



7. Next, we input the end date to be 01-05-2021.



8. We see that a user message is displayed showing that the date range is too large.

Badminton Ladder

Welcome to the Badminton Ladder Main Page!

Current Ladder of 16 Players:

- 1) V Axelsen
- 2) L Chen
- 3) YQ Shi
- 4) TC Chou
- 5) K Momota
- 6) KLA Ng
- 7) A Antonsen
- 8) D Lin
- 9) AS Ginting
- 10) K Tsuneyama

Press 'Y' to show the next 10 challengers in the ladder

Recent 2 Matches:

YQ Shi 5 / TC Chou 3 / 14-03-2021 / 21-17 21-15
K Nishimoto 16 / J Christie 13 / 12-03-2021 / 21-19 21-14

Instructions for Challengers:

- 1) Press '1' to query the order of the ladder on a specified date
- 2) Press '2' to query the data of a specific challenge based on the player names
- 3) Press '3' to query the data of a specific challenge based on the date
- 4) Press '4' to query the list of matches a player has played
- 5) Press '5' to query the most active player
- 6) Press '6' to query the least active player
- 7) Press '7' to query the list of matches played in a specific date range

Instructions for Admins:

- 1) Press 'A' to record a challenge
- 2) Press 'B' to record the result of a challenge
- 3) Press 'C' to register a new player
- 4) Press 'D' to withdraw a player from the ladder

Press 'F' to clear the screen in the event that the outputs overlap each other

My Dashboard

Query size too large, try a smaller date range!

Key Strengths and Limitations

Strengths:

1. One of the key strengths of this program is the use of save states that allow easy data backup and data restoration. The program relies on the use of text files to create save states i.e. which are the state of the data file and ladder on a specific date. These save states are created and denoted by the dates of change whenever the data or ladder files are changed. Doing this has several benefits.
 - o This allows ease of queries and good record keeping, where the text files can be referred to in the case of a program error.
 - o This also allows the match admin to do a backup or restoration of data easily by copying out these .txt files.
 - o This means that in the case where an error has been mistakenly been made (due to a bad input, etc), the in-charge of the system (e.g. the IT administrator) can refer to the last save state to restore the program by referring to the last save file by its file name and date.
 - For example, if a transaction was last made on 1 Jun 2021 and a challenger makes an error on 2 Jun 2021, causing an error that causes the program to be non-functional, the IT administrator can restore the data.txt and ladder.txt files by pasting the text contents in ladder_01-06-2021.txt and data_01-06-2021.txt into data.txt and ladder.txt
2. The program allows the user to see all the information at a glance, providing a dashboard interface for all the needs and functions that the user to use. The functions are all easily accessible in the same window, and no complicated navigation is required by the user.

Limitations:

1. Many of the input functions have to be input correctly especially the date, which have to be strictly in the DD-MM-YYYY format (e.g. 03-03-2021)
 - o Not doing so will cause errors in the program especially when a user writes the input date using slashes (/) as it will affect file creation.
2. Ladder and data changes will not be immediately reflected and only will be reflected in the next session when the program is opened.
3. Any changes to ladder or data have to be made in chronological order, and no backtracking is allowed. e.g. after a transaction for 01-04-2021 has been made, a transaction for 31-03-2021 cannot be made due to the nature of the program.
 - o There is a workaround for this though. Due to the use of save states mentioned above, we can restore the data.txt and ladder.txt files by pasting the text contents in ladder and data text to a save state to a date before 31-03-2021 and perform the required transactions for 31-03-2021 and then 01-04-2021 to get the desired outcome.