

Intelligent Reservation Agent

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ISY5001: Graduate Certificate in Intelligent Reasoning Systems

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3	IRA ChatBot
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Business Operation

- Registration of Account, Log In
- Register, Change, Delete Business
- Dashboard : Reservation, Query, Insight(Knowledge Discovery), Profile, Support
- Log Out

Business Operation

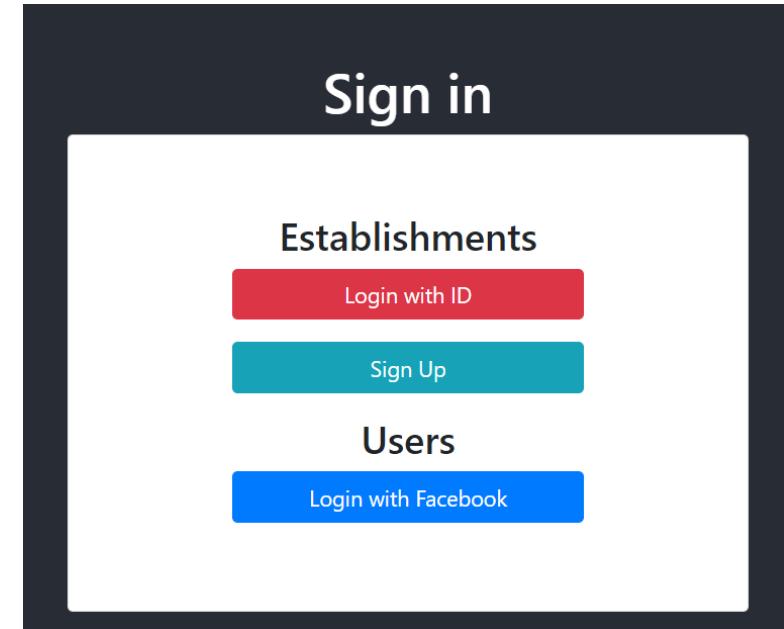
- Registration of Account

Go To

[https://\(your_ngrok_link\)/intelligentreservationagent/login/](https://(your_ngrok_link)/intelligentreservationagent/login/)

Click Sign Up

- Ensure the email is not registered before
- Password must follow the rules below in next page

A screenshot of a registration form. The title is "Registration". It has fields for "Email Address" (containing "kevin@hotmail2.com"), "Name of Incharge Person" (containing "kevin"), "Password" (containing "...."), and "Confirm Password" (also containing "...."). At the bottom is a blue "Sign Up" button.

Your password must follow these 4 rules:

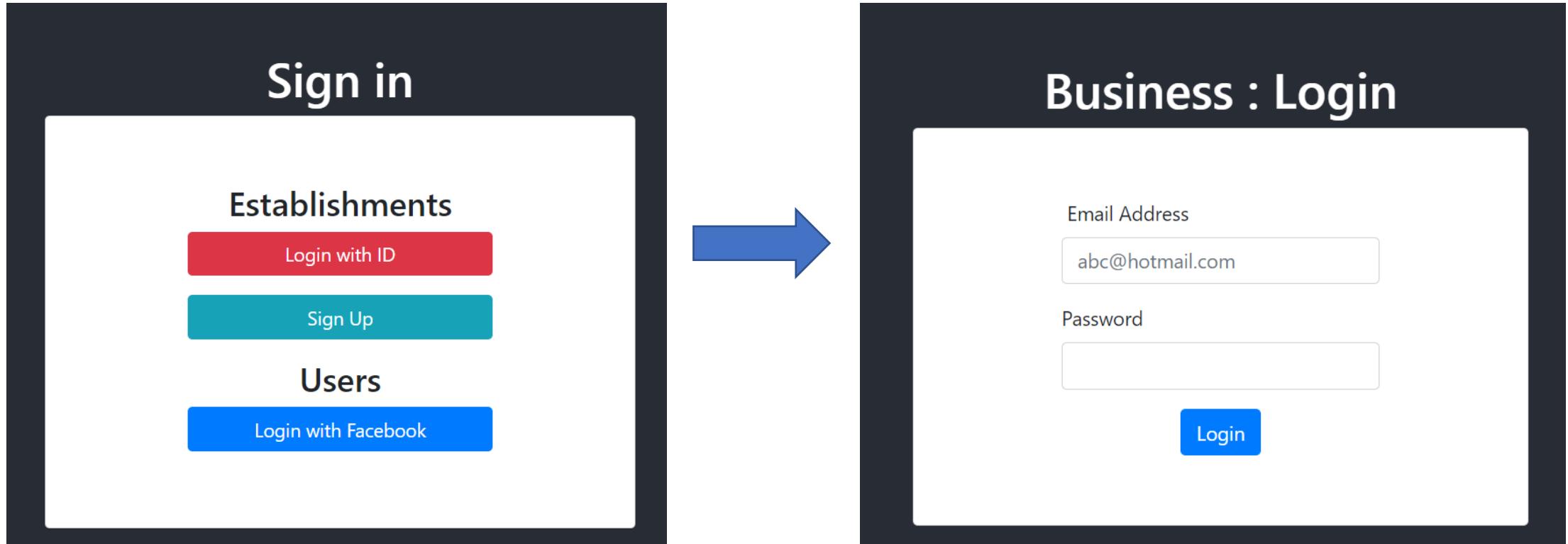
- 1) Your password must be between 6 and 20 characters.
- 2) Your password must be at least one numeral.
- 3) Your password must be at least one uppercase letter
- 4) Your password must be at least one lowercase letter

[Go back](#)

Business Operation

- Registration of Account

After registering account, login with your email and password



Business Operation

- Registering New Business

After login into the system,
Select Business Registration in
left tab bar.

The screenshot shows the IRA application interface. At the top, it displays the title "INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL". On the left, there is a sidebar titled "IRS PROJECT TEAM" containing the following menu items:

- DASHBOARD (RESERVATIONS)
- DASHBOARD (QUERIES)
- DASHBOARD (INSIGHT)
- BUSINESS REGISTRATION (selected)
- PROFILE
- SUPPORT

The main content area is divided into sections:

- Scheduling Algorithms**:
 - Run Genetic algorithm to schedule reservation (Shop and Clinic): [Run Genetic Algorithm](#)
 - Run Heuristic Rule to schedule reservation (Restaurant): [Run SL](#)
- TS Wong Clinic - Location : Bugis 1**: A table showing reservation details.

NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO
1	2020-11-04 10:10	2020-11-04 11:10	22462629839	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2
2	2020-11-04 11:20	2020-11-04 11:40	46319466178	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3

Business Operation

- Registering New Business

Section on top of this tab, it indicates all your registered business

INTELLIGENT RESERVATION AGENT – KEVIN@HOTMAIL

ISS IRS PROJECT TEAM

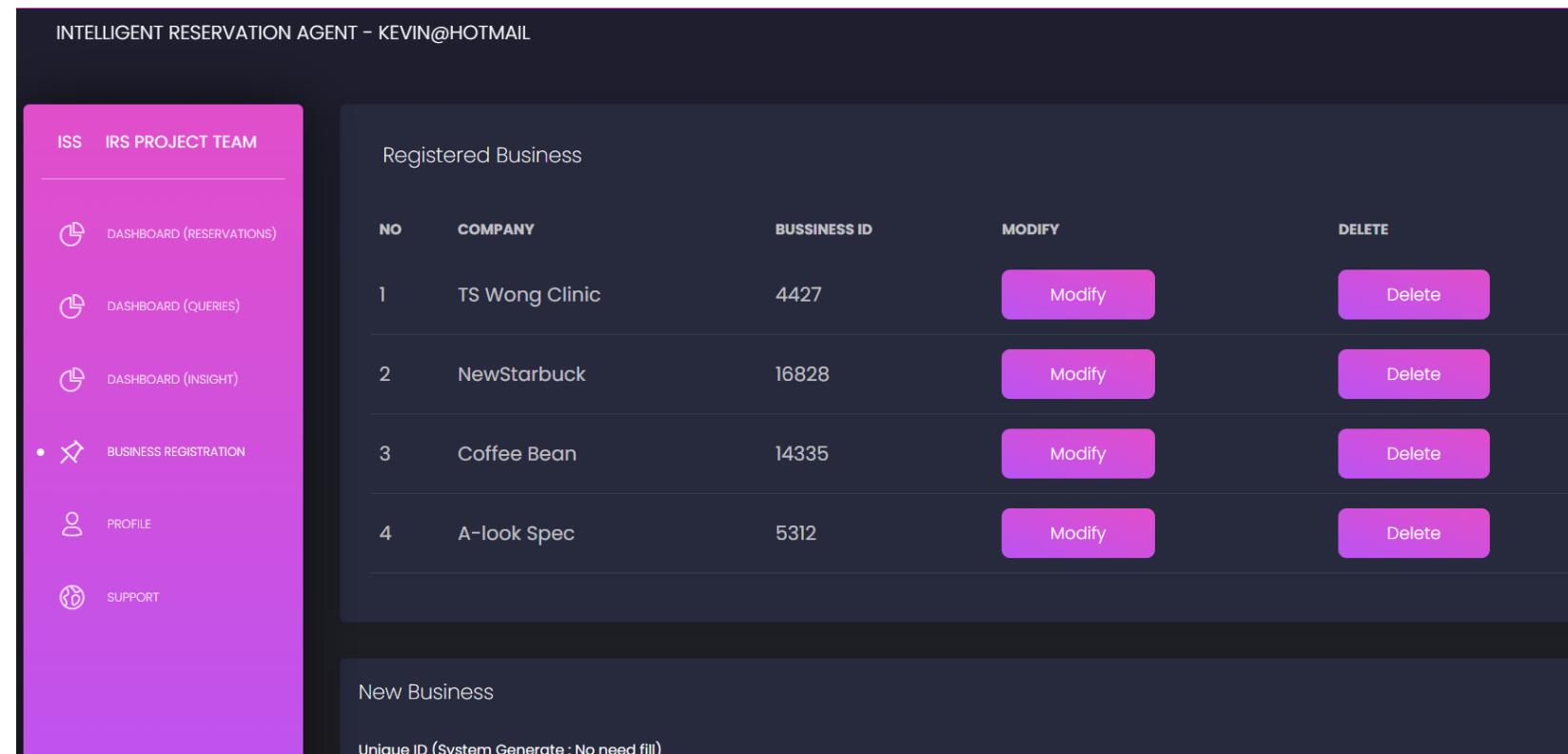
- DASHBOARD (RESERVATIONS)
- DASHBOARD (QUERIES)
- DASHBOARD (INSIGHT)
- BUSINESS REGISTRATION**
- PROFILE
- SUPPORT

Registered Business

NO	COMPANY	BUSSINESS ID	MODIFY	DELETE
1	TS Wong Clinic	4427	Modify	Delete
2	NewStarbuck	16828	Modify	Delete
3	Coffee Bean	14335	Modify	Delete
4	A-look Spec	5312	Modify	Delete

New Business

Unique ID (System Generate : No need fill)



Business Operation

- Registering New Business

The screenshot displays a user interface for managing business operations. On the left, a sidebar menu titled "IRS PROJECT TEAM" includes links for DASHBOARD (RESERVATIONS), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION (selected), PROFILE, and SUPPORT. The main area shows a list of businesses with columns for ID, Name, and Unique ID. Two entries are visible: "1 Kevin Bean" with ID 14335 and "4 A-look Spec" with ID 5312. Each entry has "Modify" and "Delete" buttons. Below this is a "New Business" form. It includes fields for Unique ID (System Generate), Company (Company Name and Location with Address), Contact (Phone number +6512345678), Type of Business (dropdown menu -- select an option --, with Sub Location example: {"S0":2,"S1":3,"S2":8,"S3":2,"S4":8}), Max Capacity, Open Time, Close Time, and a "Sub Location (Restaurant)" button.

Scroll down to below to register your
New business.

New Business

Unique ID (System Generate : No need fill)

System Generate

Company

Company Name

Location

Address

Contact

+6512345678

Type of Business

-- select an option --

Sub Location (example : {S0:2,S1:3,S2:8,S3:2,S4:8})

Sub Location (Restaurant)

Max Capacity

Number

Open Time

--:-- --

Close Time

--:-- --

Default Duration (min)

Maximum Group Size

Open Day

Monday Tuesday Wednesday Thursday Friday Saturday Sunday

Send reminder

Days in-advanced (For Customer to Book Reservation)–only valid for categories other than Restaurant

0

Reporting Period

Save

There are total 14 fields required to fill up

Business Operation

- Changing and Delete Business

Click on the button
(modify/delete) to change the
information or to delete the
business accordingly.

The screenshot shows a user interface for managing businesses. On the left, a sidebar menu lists various options: ISS IRS PROJECT TEAM, DASHBOARD (RESERVATIONS), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION, PROFILE, and SUPPORT. The main content area is titled "Registered Business" and displays a table of four entries:

NO	COMPANY	BUSINESS ID
1	TS Wong Clinic	4427
2	NewStarbuck	16828
3	Coffee Bean	14335
4	A-look Spec	5312

For each entry, there are two buttons: "MODIFY" and "DELETE". A red rectangular box highlights the "MODIFY" and "DELETE" buttons for the first three entries (rows 1, 2, and 3). At the bottom of the main area, there is a button labeled "New Business".

Business Operation

- Dashboard : Reservation

Select Dashboard(Reservation) in left tab bar.

The screenshot shows the 'INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL' application. On the left, a sidebar menu titled 'IRS PROJECT TEAM' lists several options: DASHBOARD (RESERVATIONS), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION, PROFILE, and SUPPORT. The 'DASHBOARD (RESERVATIONS)' option is highlighted with a red border. The main content area is titled 'Scheduling Algorithms'. It contains two sections: one for 'Run Genetic algorithm to schedule reservation (Shop and Clinic)' with a 'Run Genetic Algorithm' button, and another for 'Run Heuristic Rule to schedule reservation (Restaurant)' with a 'Run SL' button. Below this is a section titled 'TS Wong Clinic - Location : Bugis 1' which displays a table of reservation details.

NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO OF PAX	STATUS
1	2020-11-04 10:10	2020-11-04 11:10	22462629839	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	cancelled
2	2020-11-04 11:20	2020-11-04 11:40	46319466178	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed
3	2020-11-12 11:30	2020-11-12 12:10	30482331953	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed

Business Operation

- Dashboard : Reservation

You can run GA and SL to schedule those observation on hold

The screenshot shows the 'INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL' interface. On the left, a sidebar menu lists: ISS, IRS PROJECT TEAM, DASHBOARD (RESERVATIONS) (selected), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION, PROFILE, and SUPPORT. The main area has a dark background. A red box highlights the 'Scheduling Algorithms' section, which contains two buttons: 'Run Genetic Algorithm' and 'Run SL'. Below this, another section displays a table titled 'TS Wong Clinic - Location : Bugis 1' with the following data:

NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO OF PAX	STATUS
1	2020-11-04 10:10	2020-11-04 11:10	22462629839	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	cancelled
2	2020-11-04 11:20	2020-11-04 11:40	46319466178	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed
3	2020-11-12 11:30	2020-11-12 12:10	30482331953	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed

Business Operation

- Dashboard : Reservation

Visualize all the reservations
for registered business

The screenshot displays the Intelligent Reservation Agent interface. On the left is a sidebar with navigation links: ISS IRS PROJECT TEAM, DASHBOARD (RESERVATIONS) (selected), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION, PROFILE, and SUPPORT. The main area shows two tables of reservation data.

TS Wong Clinic - Location : Bugis 1

NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO OF PAX	STATUS
1	2020-11-04 10:10	2020-11-04 11:10	22462629839	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	cancelled
2	2020-11-04 11:20	2020-11-04 11:40	46319466178	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed
3	2020-11-12 11:30	2020-11-12 12:10	30482331953	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed
4	2020-11-24 10:10	2020-11-24 11:10	38862175676	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed

NewStarbuck - Location : Bugis 1

NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO OF PAX	STATUS
5	2020-10-11 14:00	2020-10-11 14:20	2806728422	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	confirmed
6	2020-11-06 14:10	2020-11-06 14:11	2806728402	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	changed
7	2020-11-11 14:00	2020-11-11 14:20	2806728402	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	confirmed

Business Operation

- Dashboard : Queries

Select Dashboard(Queries) in left tab bar. It displays all the queries, you could run “summary” to get the insight (knowledge discovery) for Your business analysis)

The screenshot shows the 'INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL' application. On the left, a sidebar menu lists several options: 'ISS IRS PROJECT TEAM', 'DASHBOARD (RESERVATIONS)', 'DASHBOARD (QUERIES)' (which is highlighted with a red border), 'DASHBOARD (INSIGHT)', 'BUSINESS REGISTRATION', 'PROFILE', and 'SUPPORT'. The main content area is titled 'Queries (Summary)' and contains a 'Summary' button. Below this, a table displays reservation data for 'TS Wong Clinic - Location : Bugis 1'. The table has columns: NO, TIME IN, TIME OUT, SESSION, CUSTOMER, CONTACT, EMAIL, NO OF PAX, and INTENT. Three rows of data are shown:

NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO OF PAX	INTENT
1	20/11/04_10:27	20/11/04_12:13	12731470735 160379202 timeout	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	NewReservation
2	20/11/04_10:03	20/11/04_10:13	22462629839 1603794228 success	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	NewReservation
3	20/11/04_10:03	20/11/04_11:03	22462629839 1603794228 success	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	NewReservation

Business Operation

- Dashboard : Queries

Result from summary button
(example)

INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL

> Queries (Summary)

Back

	id	establishment	timestamp	period	n_total	DuplicateExist	FinalizeReservation	OfferSlots	OversizedGroup	PlaceNotAvail	OutsideOpenDays	InThePast
0	0.0	14335	20/11/07_17:23:16.619207	20/10/06	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
1	0.0	14335	20/11/07_17:23:16.631209	20/10/13	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
2	0.0	14335	20/11/07_17:23:16.642146	20/10/28	1	0.0	0.0	100.0	0.0	0.0	0.0	0.0
3	0.0	14335	20/11/07_17:23:16.654150	20/11/02	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	14335	20/11/07_17:23:16.667013	20/11/03	1	0.0	100.0	0.0	0.0	0.0	0.0	0.0
5	0.0	14335	20/11/07_17:23:16.676986	20/11/04	4	0.0	25.0	0.0	0.0	0.0	0.0	0.0
6	0.0	14335	20/11/07_17:23:16.692911	20/11/05	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
7	0.0	14335	20/11/07_17:23:16.706873	20/11/07	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	0.0	14335	20/11/07_17:23:16.719966	20/11/09	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	0.0	14335	20/11/07_17:23:16.731966	20/11/10	1	0.0	0.0	100.0	0.0	0.0	0.0	0.0
10	0.0	14335	20/11/07_17:23:16.742412	20/11/11	3	0.0	33.33333333333336	33.33333333333336	0.0	0.0	0.0	0.0
11	0.0	14335	20/11/07_17:23:16.755412	20/11/13	2	0.0	0.0	0.0	0.0	0.0	100.0	0.0
12	0.0	16828	20/11/07_17:23:17.774193	20/10/06	2	0.0	0.0	0.0	0.0	0.0	0.0	100.0
13	0.0	16828	20/11/07_17:23:17.786165	20/10/13	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
14	0.0	16828	20/11/07_17:23:17.798132	20/10/22	2	0.0	0.0	0.0	0.0	0.0	0.0	100.0
15	0.0	16828	20/11/07_17:23:17.809103	20/10/26	1	0.0	0.0	0.0	0.0	0.0	0.0	100.0
16	0.0	16828	20/11/07_17:23:17.821106	20/11/06	2	0.0	50.0	0.0	0.0	0.0	0.0	0.0

Result from summary button (example)

> Queries (Summary)

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Business Operation

- Dashboard : Insight(Knowledge Discovery)

Select
Dashboard(Insight) in
left tab bar to discover
the knowledge from
reservation

The screenshot shows a dark-themed dashboard interface. On the left, a sidebar menu titled 'IRS PROJECT TEAM' lists several options: 'DASHBOARD (RESERVATIONS)', 'DASHBOARD (QUERIES)', 'DASHBOARD (INSIGHT)' (which is highlighted with a red border), 'BUSINESS REGISTRATION', 'PROFILE', and 'SUPPORT'. The main content area is titled 'Reservation Insight' and displays a table of data. The table has columns: NO, TIMESTAMP, ESTABLISHMENT, UTILIZATION, ACCEPTANCE, SOURCE, PERIOD, and HOURLY. The data rows are as follows:

NO	TIMESTAMP	ESTABLISHMENT	UTILIZATION	ACCEPTANCE	SOURCE	PERIOD	HOURLY
1	20/11/07_15:19:55.978771	NewStarbuck	0.0	100.0	sl	20/11/06_14:00	Hourly
2	20/11/07_15:19:56.010685	NewStarbuck	0.0	50.0	sl	20/11/11_14:00	Hourly
3	20/11/07_15:19:56.049582	NewStarbuck	0.0	inf	sl	20/10/11_14:00	Hourly
4	20/11/07_15:19:55.846122	Coffee Bean	0.0	25.0	sl	20/11/04_11:00	Hourly
5	20/11/07_15:19:55.871058	Coffee Bean	0.0	67.0	sl	20/11/02_11:00	Hourly
6	20/11/07_15:19:55.935885	Coffee Bean	0.0	inf	sl	20/11/11_15:00	Hourly
7	20/11/03_22:20:49.931822	A-look Spec	2.0	100	qa	20/11/18_09:00	Hourly

Business Operation

- Dashboard : Insight(Knowledge Discovery)

It displays optimization algorithm result, click on hourly to understand the performance of shop hourly

INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL

ISS	IRS PROJECT TEAM
	DASHBOARD (RESERVATIONS)
	DASHBOARD (QUERIES)
	DASHBOARD (INSIGHT)
	BUSINESS REGISTRATION
	PROFILE
	SUPPORT

Reservation Insight

NO	TIMESTAMP	ESTABLISHMENT	UTILIZATION	ACCEPTANCE	SOURCE	PERIOD	HOURLY
1	20/11/07_15:19:55.978771	NewStarbuck	0.0	100.0	sl	20/11/06_14:00	<button>Hourly</button>
2	20/11/07_15:19:56.010685	NewStarbuck	0.0	50.0	sl	20/11/11_14:00	<button>Hourly</button>
3	20/11/07_15:19:56.049582	NewStarbuck	0.0	inf	sl	20/10/11_14:00	<button>Hourly</button>
4	20/11/07_15:19:55.846122	Coffee Bean	0.0	25.0	sl	20/11/04_11:00	<button>Hourly</button>
5	20/11/07_15:19:55.871058	Coffee Bean	0.0	67.0	sl	20/11/02_11:00	<button>Hourly</button>
6	20/11/07_15:19:55.935885	Coffee Bean	0.0	inf	sl	20/11/11_15:00	<button>Hourly</button>
7	20/11/03_22:20:49.931822	A-look Spec	2.0	100	ga	20/11/18_09:00	<button>Hourly</button>

Hourly Insight

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n_person_request	n_person_accepted	hourly
00	0	20/11/17_09:00
10	0	20/11/17_10:00
20	0	20/11/17_11:00
30	0	20/11/17_12:00
40	0	20/11/17_13:00
50	0	20/11/17_14:00
62	2	20/11/17_15:00
70	0	20/11/17_16:00

Business Operation

- Dashboard : Profile

Inside Profile tab,
It allows user to change
information of account
or change password

The screenshot shows the 'Edit Profile' section of the application. At the top, it displays the title 'INTELLIGENT RESERVATION AGENT - KEVIN@HOTMAIL'. On the left, there is a sidebar titled 'IRS PROJECT TEAM' containing several navigation items: 'DASHBOARD (RESERVATIONS)', 'DASHBOARD (QUERIES)', 'DASHBOARD (INSIGHT)', 'BUSINESS REGISTRATION', 'PROFILE' (which is currently selected), and 'SUPPORT'. The main content area is titled 'Edit Profile' and contains fields for 'Business ID (System Generate)' (set to 'kevin@hotmail'), 'Email Address (System Generate)' (set to 'kevin@hotmail'), 'Person In Charge' (set to 'Hamsi'), 'Contact' (set to '+659333333'), and 'Mailing Address' (set to 'kevin@hotmail.com'). At the bottom, there are two buttons: 'Save New Profile' and 'Change Password'.

Business Operation

- Dashboard : Support

Any inquiries, user can seek help from respective representative.

The screenshot displays the IRA dashboard interface. On the left, a sidebar titled "IRS PROJECT TEAM" lists several menu items: DASHBOARD (RESERVATIONS), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION, PROFILE, and SUPPORT. The SUPPORT item is highlighted with a pink background. The main content area shows three team members: Januwar Hadi, Hamsamalini, and Kevin Chng Jun Yan. Each member has a circular profile picture, their name, and a list of their expertise. The background of the main content area is dark blue.

Team Member	Expertise
Januwar Hadi	Rule-Based Engine, GA Algorithm, Database Design
Hamsamalini	Chatbot, Django-Chatbot Connection, Database Design
Kevin Chng Jun Yan	Frontend, Django Framework, Database Design

Business Operation

- Log Out

The screenshot shows the 'INTELLIGENT RESERVATION AGENT – KEVIN@HOTMAIL' interface. On the left, a sidebar lists navigation options: ISS IRS PROJECT TEAM, DASHBOARD (RESERVATIONS) (selected), DASHBOARD (QUERIES), DASHBOARD (INSIGHT), BUSINESS REGISTRATION, PROFILE, and SUPPORT. The main content area features two sections: 'Scheduling Algorithms' with buttons for 'Run Genetic Algorithm' and 'Run SL', and a table titled 'TS Wong Clinic – Location : Bugis 1' listing reservations. A red box highlights the 'Profile' and 'Log out' links in the top right corner.

INTELLIGENT RESERVATION AGENT – KEVIN@HOTMAIL

ISS IRS PROJECT TEAM

- DASHBOARD (RESERVATIONS)
- DASHBOARD (QUERIES)
- DASHBOARD (INSIGHT)
- BUSINESS REGISTRATION
- PROFILE
- SUPPORT

Scheduling Algorithms

Run Genetic algorithm to schedule reservation (Shop and Clinic):

Run Genetic Algorithm

Run Heuristic Rule to schedule reservation (Restaurant):

Run SL

TS Wong Clinic – Location : Bugis 1								
NO	TIME IN	TIME OUT	SESSION	CUSTOMER	CONTACT	EMAIL	NO OF PAX	STATUS
1	2020-11-04 10:10	2020-11-04 11:10	22462629839	Kevin Ch'ng	93777788	kevinchng@hotmail.com	2	cancelled
2	2020-11-04 11:20	2020-11-04 11:40	46319466178	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed
3	2020-11-12 11:30	2020-11-12 12:10	30482331953	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed
4	2020-11-24 10:10	2020-11-24 11:10	38862175676	Kevin Ch'ng	93777788	kevinchng@hotmail.com	3	confirmed

Profile

Log out

Patron/User Operation

- Registration of Account
- Book, Change & Delete Reservation
- Dashboard : Reservation, Map, Profile, Past History, Support
- Logout

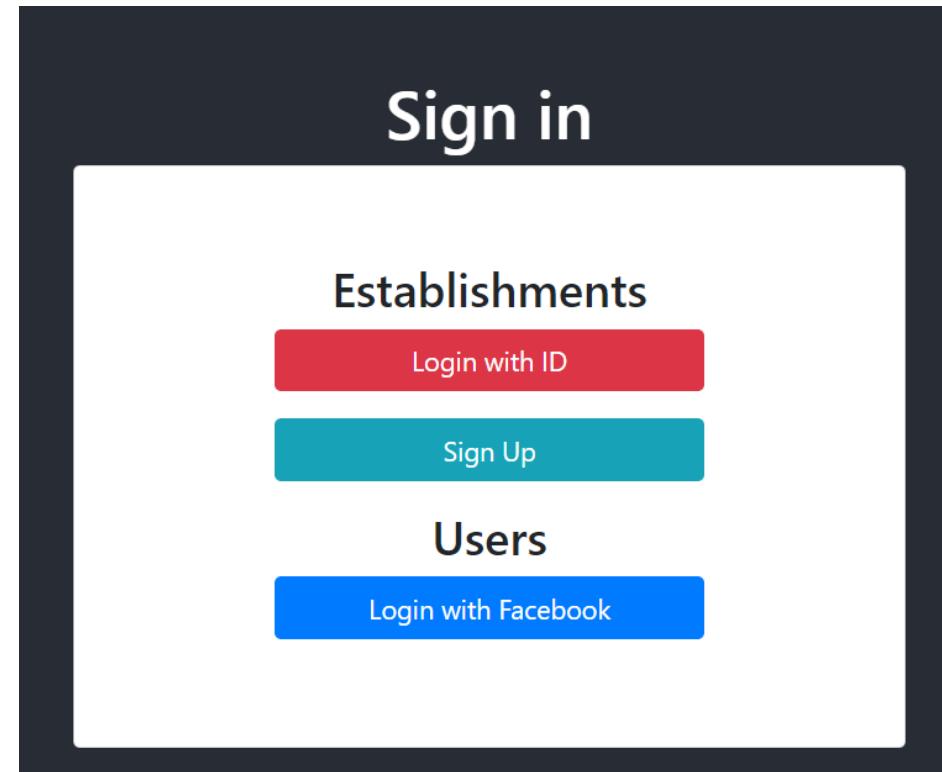
Patron/User Operation

- Registration of Account : Login using Facebook Authentication

Go To

[https://\(your_ngrok_link\)/intelligentreservationagent/login/](https://(your_ngrok_link)/intelligentreservationagent/login/)

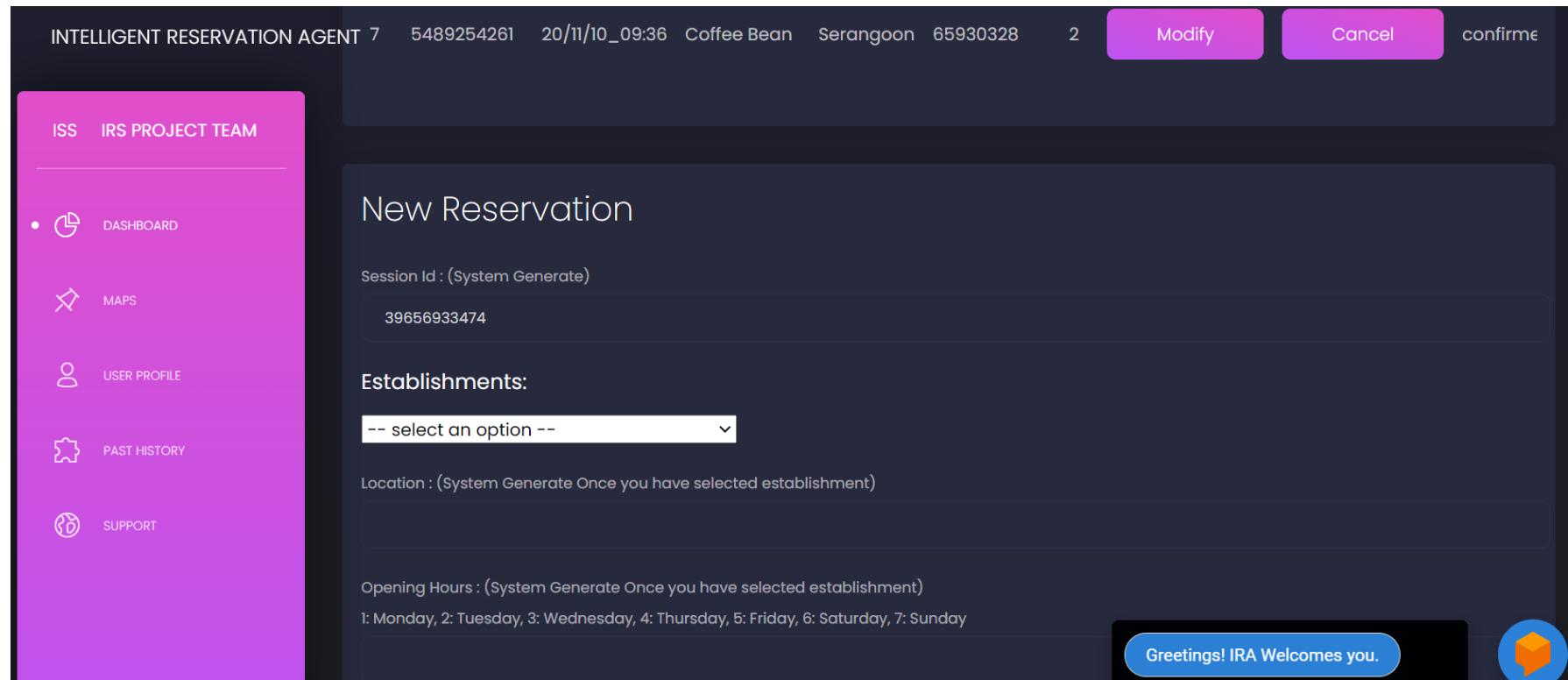
> Select “Login with Facebook”



Patron/User Operation

- Book Reservation (Success Booking Example)

Select Dashboard in left tab bar, look for “New Reservation”



Patron/User Operation

- Book Reservation (Success Booking Example)

Fill your reservation information

The screenshot shows the 'New Reservation' page of the Intelligent Reservation Agent. At the top left is a sidebar with 'ISS IRS PROJECT TEAM' and a 'DASHBOARD' button. The main area has a title 'New Reservation' and a sub-section 'Establishments:' with a dropdown menu set to 'TS Wong Clinic (Bugis 1)'. Below it are fields for 'Location' (Bugis 1), 'Opening Hours' (Monday to Sunday, 1000 to 1900), and a table for 'Reservation Date', 'Reservation-Time In', 'Reservation-Time Out', and 'Number of People' (set to 2). A red bracket on the left points from the 'Establishments:' dropdown to a callout box containing the text 'Display Location, operation time, opening days of selected establishment'. Another red bracket on the right points from the 'Reservation Date' field to the callout box for step 2.

Display Location, operation time, opening days of selected establishment

(1) Select Reservation

(2) Fill reservation date, time in, time out, number of people/pax

Reservation Date	Reservation-Time In	Reservation-Time Out	Number of People
25/11/2020	02:55 PM	03:55 PM	2

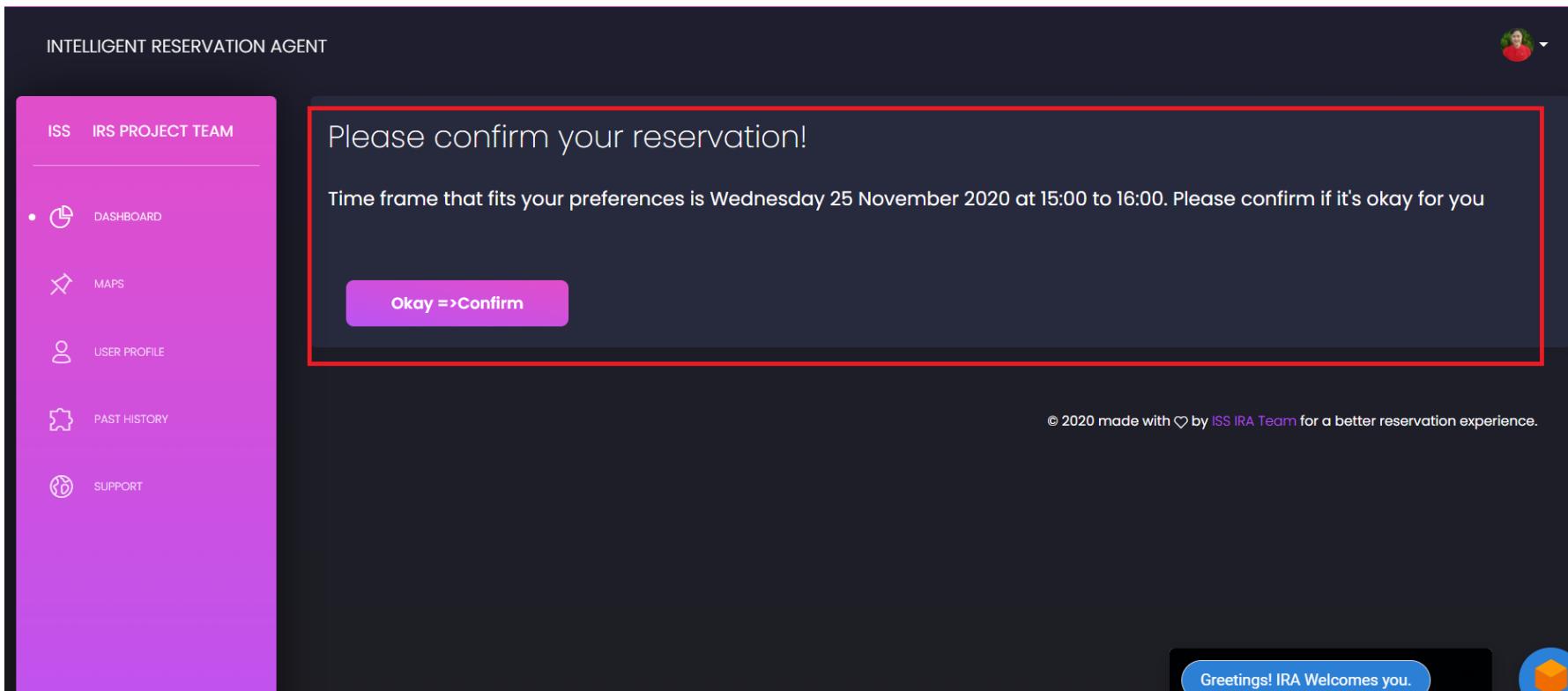
Reserve

Patron/User Operation

- Book Reservation (Success Booking Example)

If the slots is available, it will seek for your confirmation

Please click “Okay =>Confirm” button in 30seconds, else the reservation would be time-out, the system will ask you to make a new reservation again.



Patron/User Operation

- Book Reservation (Success Booking Example)

After confirm your reservation, system will indicate as follows :

The screenshot shows the IRA application interface. On the left, there is a sidebar with a pink header containing the text "INTELLIGENT RESERVATION AGENT" and "IRS PROJECT TEAM". Below this, there is a navigation menu with the following items:

- DASHBOARD (selected, indicated by a dot icon)
- MAPS
- USER PROFILE
- PAST HISTORY
- SUPPORT

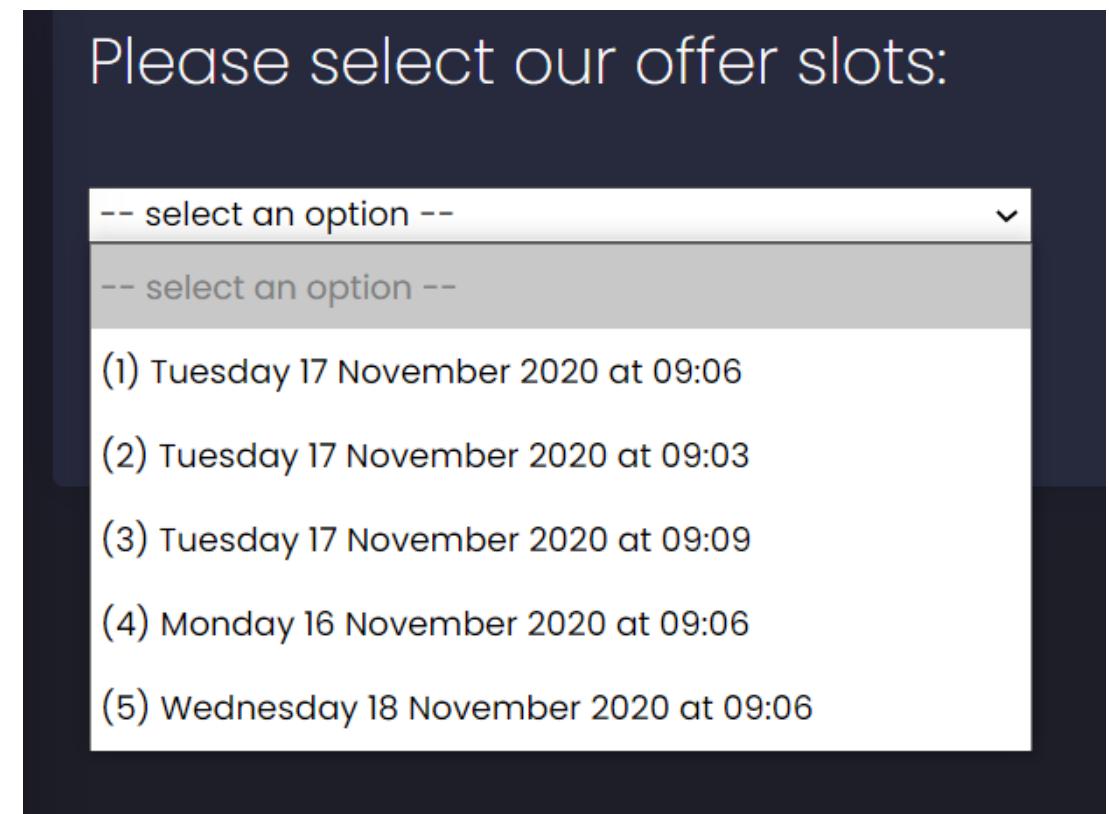
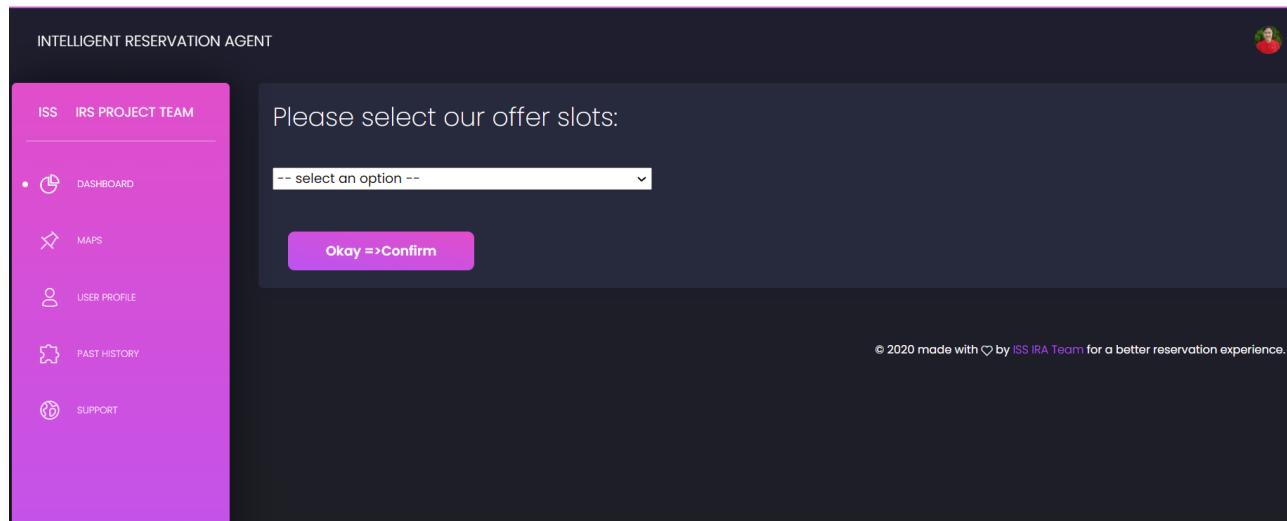
The main content area has a dark background. A red rectangular box highlights a message box. Inside the message box, the text "Reservation Confirm!" is displayed in large white font. Below it, a message states: "Your request for 3 person(s) on Wednesday 25 November 2020 at 15:10 to 16:10 is now on-hold. Please status check after cutoff time 19:00". At the bottom of the message box is a blue button labeled "Back to Dashboard". In the bottom right corner of the main content area, there is a small blue button with the text "Greeting! IRA Welcomes you".

Patron/User Operation

- Book Reservation (Success Booking Example)

for optimization purpose-(restaurant), the system will return top 5 reservation time for your selection.

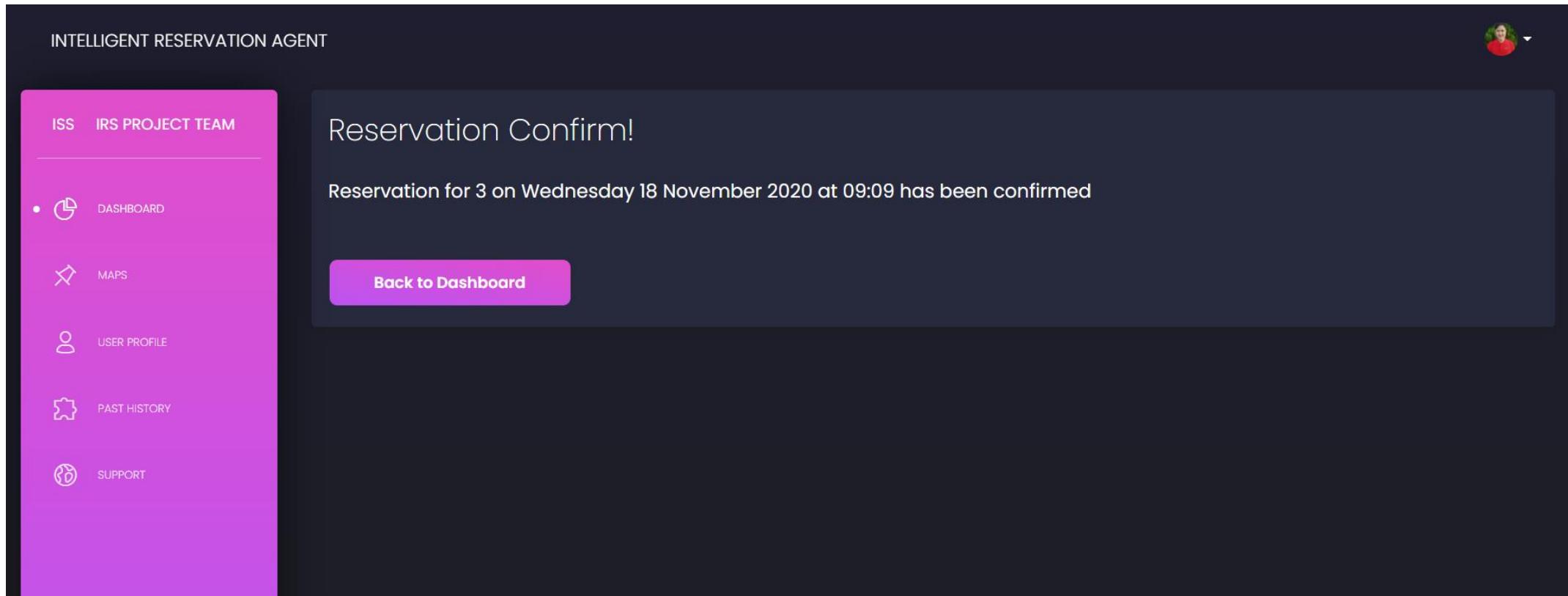
Please select and click “Okay =>Confirm” button in 30seconds, else the reservation would be time-out, the system will ask you to make a new reservation again.



Patron/User Operation

- Book Reservation (Success Booking Example)

After select your time slot. the system will indication as follows:

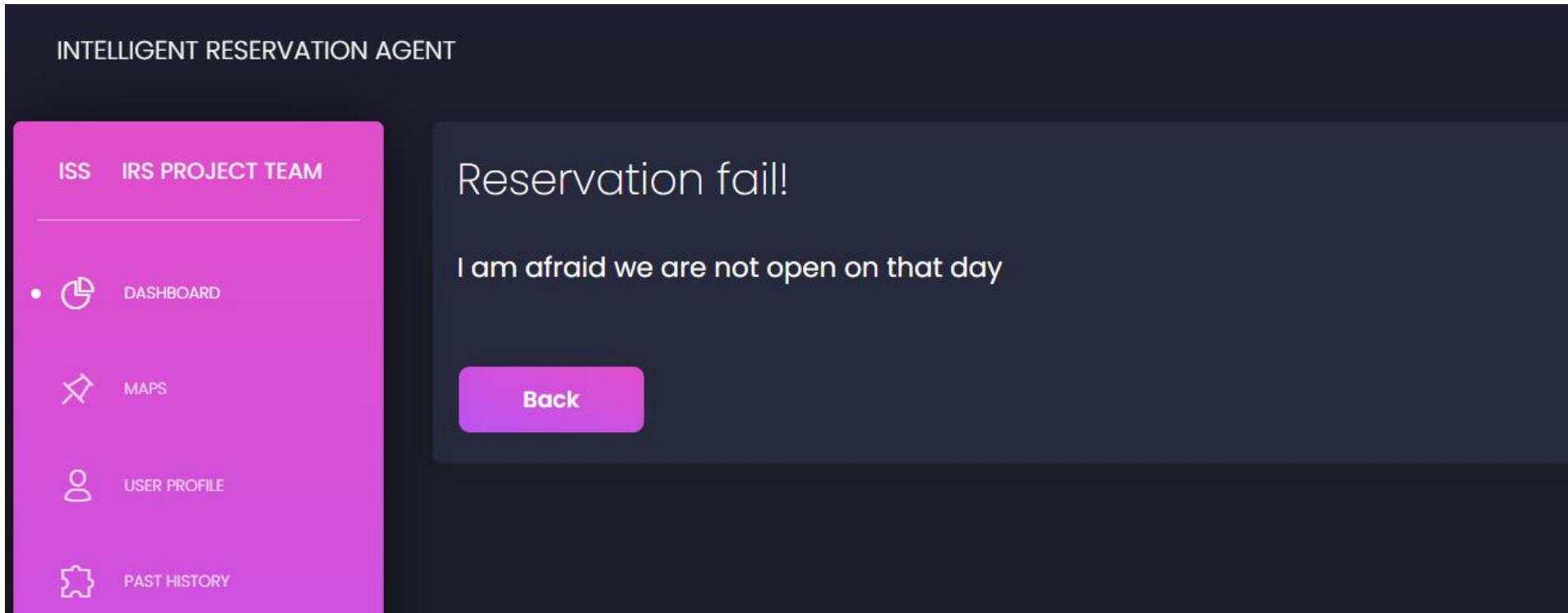


Patron/User Operation

- Book Reservation (Fail Booking Example)

For fail case, after submitting reservation, you will see the return as follows:

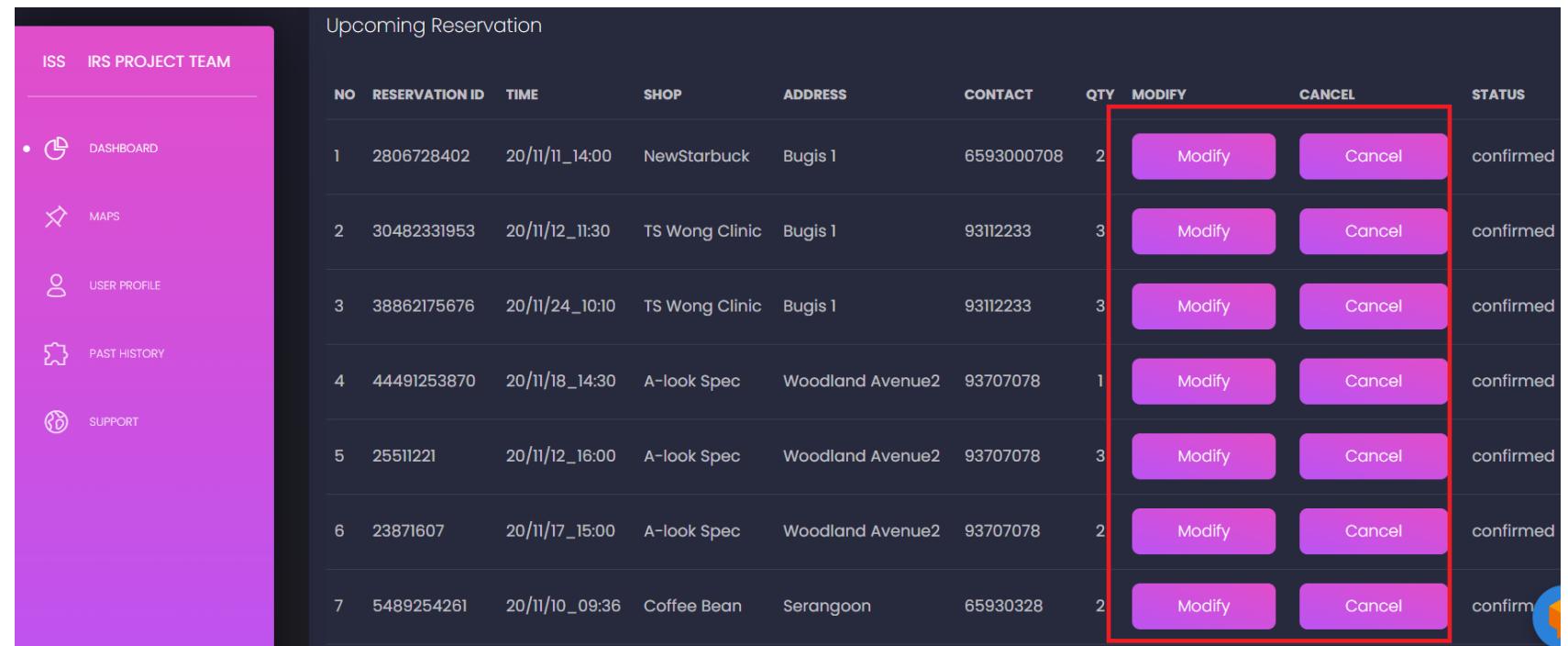
(there are many rules in rules engine to ensure your reservation is valid, you may refer to rules engine for more details) – Photo below shows the rule why we fail this reservation



Patron/User Operation

- Change, delete Reservation

Select Dashboard in left tab bar, you will see upcoming reservation, you can modify or cancel the reservation by clicking the respective buttons



Upcoming Reservation									
NO	RESERVATION ID	TIME	SHOP	ADDRESS	CONTACT	QTY	MODIFY	CANCEL	STATUS
1	2806728402	20/11/11_14:00	NewStarbuck	Bugis 1	6593000708	2	<button>Modify</button>	<button>Cancel</button>	confirmed
2	30482331953	20/11/12_11:30	TS Wong Clinic	Bugis 1	93112233	3	<button>Modify</button>	<button>Cancel</button>	confirmed
3	38862175676	20/11/24_10:10	TS Wong Clinic	Bugis 1	93112233	3	<button>Modify</button>	<button>Cancel</button>	confirmed
4	44491253870	20/11/18_14:30	A-look Spec	Woodland Avenue2	93707078	1	<button>Modify</button>	<button>Cancel</button>	confirmed
5	25511221	20/11/12_16:00	A-look Spec	Woodland Avenue2	93707078	3	<button>Modify</button>	<button>Cancel</button>	confirmed
6	23871607	20/11/17_15:00	A-look Spec	Woodland Avenue2	93707078	2	<button>Modify</button>	<button>Cancel</button>	confirmed
7	5489254261	20/11/10_09:36	Coffee Bean	Serangoon	65930328	2	<button>Modify</button>	<button>Cancel</button>	confirm

Patron/User Operation

- Dashboard : Reservation

Features :

- 1) View all upcoming reservations
- 2) Make New Reservation

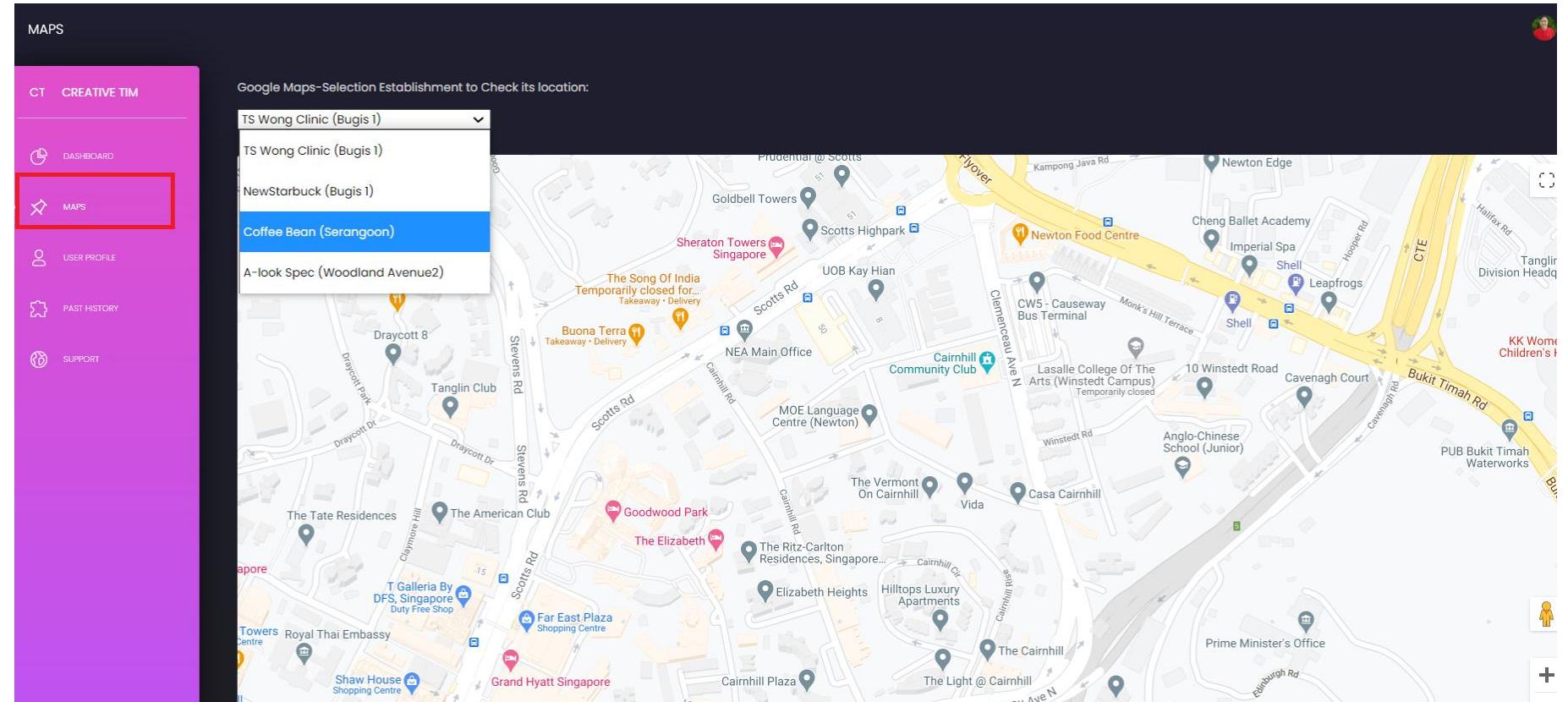
The screenshot shows the IRA dashboard interface. On the left, a sidebar menu lists 'DASHBOARD' (highlighted with a red box), 'MAPS', 'USER PROFILE', 'PAST HISTORY', and 'SUPPORT'. The main area is titled 'Upcoming Reservation' and displays a table of seven rows. Each row represents a reservation with columns for No., Reservation ID, Time, Shop, Address, Contact, Qty, Modify, Cancel, and Status. The 'Modify' and 'Cancel' buttons are purple, while the 'Status' column shows 'confirmed' for most entries except the last one which has a blue speech bubble icon.

NO	RESERVATION ID	TIME	SHOP	ADDRESS	CONTACT	QTY	MODIFY	CANCEL	STATUS
1	2806728402	20/11/11_14:00	NewStarbuck	Bugis 1	6593000708	2	<button>Modify</button>	<button>Cancel</button>	confirmed
2	30482331953	20/11/12_11:30	TS Wong Clinic	Bugis 1	93112233	3	<button>Modify</button>	<button>Cancel</button>	confirmed
3	38862175676	20/11/24_10:10	TS Wong Clinic	Bugis 1	93112233	3	<button>Modify</button>	<button>Cancel</button>	confirmed
4	44491253870	20/11/18_14:30	A-look Spec	Woodland Avenue2	93707078	1	<button>Modify</button>	<button>Cancel</button>	confirmed
5	25511221	20/11/12_16:00	A-look Spec	Woodland Avenue2	93707078	3	<button>Modify</button>	<button>Cancel</button>	confirmed
6	23871607	20/11/17_15:00	A-look Spec	Woodland Avenue2	93707078	2	<button>Modify</button>	<button>Cancel</button>	confirmed
7	5489254261	20/11/10_09:36	Coffee Bean	Serangoon	65930328	2	<button>Modify</button>	<button>Cancel</button>	confirmed

Patron/User Operation

- Dashboard : Map

Features :
Check the location of establishment



Patron/User Operation

- Dashboard : Profile

Features :
Change or Update
User's profile

The screenshot illustrates the user profile editing process. On the left, a sidebar menu shows options: ISS, IRS PROJECT TEAM, DASHBOARD, MAPS, USER PROFILE (which is highlighted with a red border), PAST HISTORY, and SUPPORT. The main area is titled 'Edit Profile' and contains fields for Company (disabled), User ID (10221319817239380), Email address (Facebook) (kevinchng@hotmail.com), First Name (Facebook) (Kevin), Last Name (Facebook) (Ch'ng), Address (Woodland), City (None), Country (None), Postal Code (330221), and Contact NO. (93777788). A 'Save' button is at the bottom. To the right, a preview window shows a circular profile picture of a man in a red shirt, with the name 'Kevin Ch'ng' below it and a small Facebook icon.

Patron/User Operation

- Dashboard : Past History

Features :
View the Past History
of Reservation

The screenshot displays a mobile application interface for managing reservations. On the left, there is a vertical sidebar menu with the following items:

- ISS IRS PROJECT TEAM
- DASHBOARD
- MAPS
- USER PROFILE
- PAST HISTORY (highlighted with a red border)
- SUPPORT

The main content area is titled "Past Reservation" and lists two entries:

NO	RESERVATION ID	TIME	SHOP	ADDRESS	CONTACT	QTY	STATUS
1	22462629839	20/11/04_10:10	TS Wong Clinic	Bugis 1	93112233	2	cancelled
2	projects/ira-Imam/agent/sessions/dfMessenger-9705540	20/11/11_15:57	Coffee Bean	Serangoon	65930328	2	cancelled

Patron/User Operation

- Dashboard : Support

Features :
Looking support for
respective area

The screenshot displays the 'INTELLIGENT RESERVATION AGENT' application interface. On the left, a sidebar menu titled 'IRS PROJECT TEAM' lists five items: DASHBOARD, MAPS, USER PROFILE, PAST HISTORY, and SUPPORT. The 'SUPPORT' item is highlighted with a red border. The main content area shows three team members: Januwar Hadi, Hamsamalini, and Kevin Chng Jun Yan, each with a profile picture and a list of their contributions.

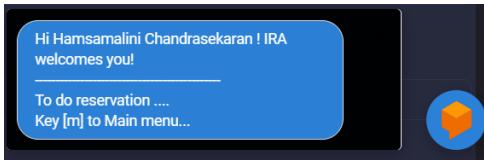
Team Member	Contributions
Januwar Hadi	Rule-Based Engine, GA Algorithm, Database Design
Hamsamalini	Chatbot, Django-Chatbot Connection, Database Design
Kevin Chng Jun Yan	Frontend, Django Framework, Database Design

IRA ChatBot

IRA ChatBot

Objective

- Enable real-time interaction with Patron for reservation activities to any establishment(Clinic, Restaurant, Shopping malls, Training Institute etc)
- ChatBot applies the intelligence using the Rules to
 - Book ,
 - Change ,
 - Check
 - Cancel reservation
- The ChatBot of type Dialogflow Messenger is constructed using Google Dialogflow.
- For each activity an intent is created. Altogether there are 13 intents created to solve the purpose
- Entities for each establishment, establishment_type, selection option are created.
- Agent training is done for intent identification
- The input, output contexts for each intents are created to enable navigation from one intent to another



IRA ChatBot

Objective

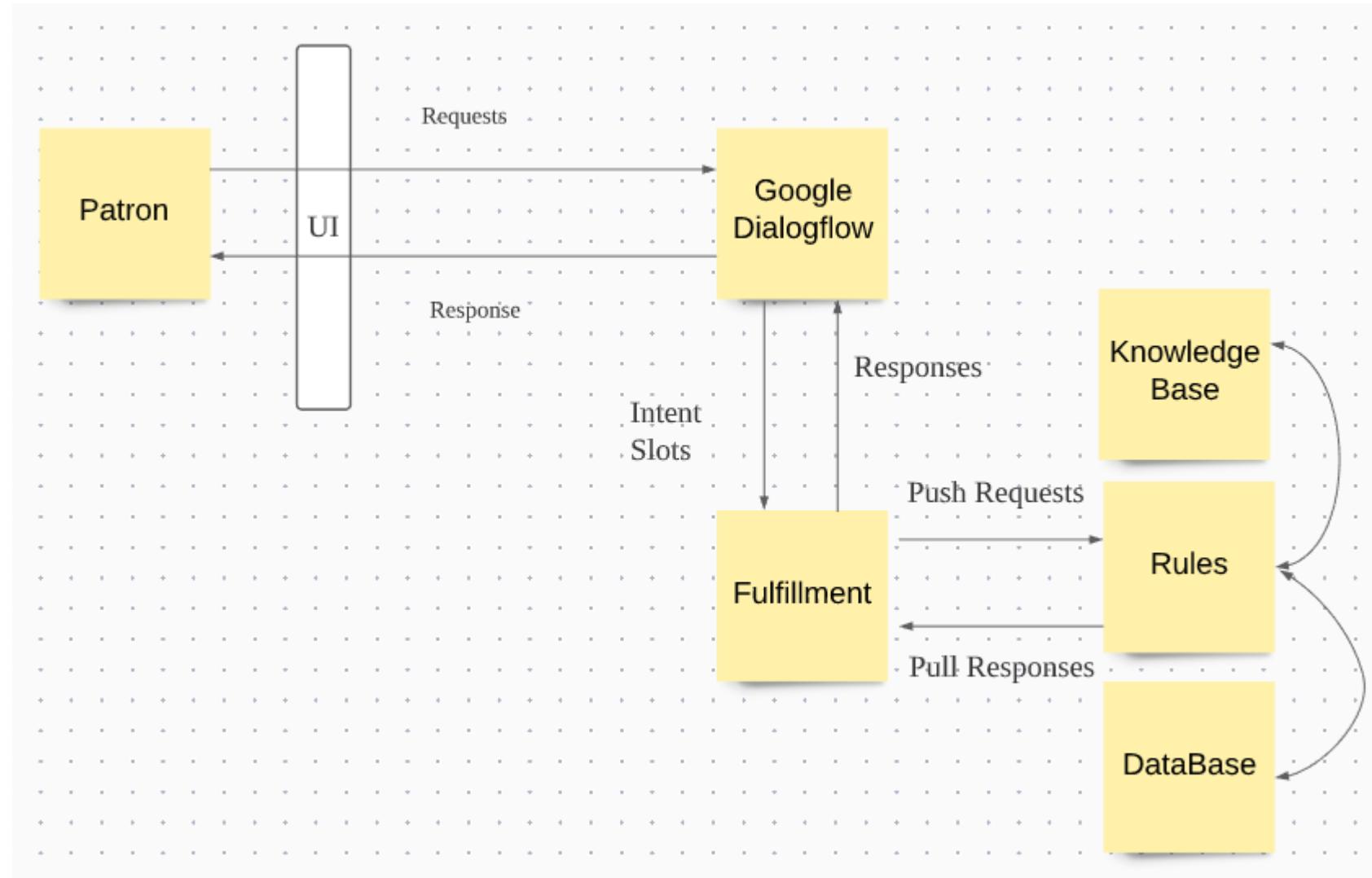
- Events for the intent are created.
- Events are triggered through custom response
- To avoid complexity in parsing Patron input, useful information extraction, summary generation, confirmation through custom intents and question Answering Pattern is followed,
- Dynamic response is generated by enabling fulfilment through webhook.
- Actions corresponding to the intents are processed in Django through fulfilment.
- The Django dialogflow api allows capturing the intent and returns fulfilment.
- The process involves communication with Rules engine, Knowle
- The Rich response are rendered using
 - dialogflow_v2beta1 api and custom response



IRA ChatBot

Architecture

- The patron communicates to Dialogflow placing request & receiving response.
- The requests are processed through dialogflow fulfillment. For each request, relevant intents are invoked, and the requests are processed dynamically through fulfillment.
- The fulfillment process the requests based on the rules, knowledge from knowledge base and data from database.



IRA ChatBot: Follow up with Rules

Features

- Agent Training is done to invoke the relevant intents
- Tokenization challenges are met with syntactic analysis
- Case normalization are done

Which date (e.g. Dec 10)?

book for friday

NewStarbuck @ Bugis 1 says : You have requested for a reservation on Friday 13 November 2020 from 16:00 for 2 people.

Key [c] to confirm
Key [m] to Main menu

show my status of my reservations

Your upcoming reservation status...

Establishment: TS Wong Clinic
No. of Person(s) :3
Time in :20/11/11 at 15:20
Status :on-hold

Establishment: NewStarbuck
No. of Person(s) :4
Time in :20/11/09 at 14:50
Status :confirmed

Establishment: NewStarbuck
No. of Person(s) :4
Time in :20/11/30 at 09:00
Status :confirmed

Which date (e.g. Dec 10)?

Saturday

What time to begin (e.g. 3 pm) ?

4PM

How many seats do you want to book ?

3

Your expected time Out? (e.g. 4.20 pm . Key 0 if unknown)

8 pm

A-look Spec @ Woodland Avenue2 says : You have requested for a reservation on Saturday 7 November 2020 from 16:00 to 20:00 for 3 people....
Key [c] to confirm
Key [m] to Main menu



- ISS IRS PROJECT TEAM
- DASHBOARD
- MAPS
- USER PROFILE
- PAST HISTORY
- SUPPORT

Upcoming Reservation

NO	RESERVATION ID	TIME	SHOP	ADDRESS	CONTACT	QTY	MODIFY	CANCEL	STATUS
----	----------------	------	------	---------	---------	-----	--------	--------	--------

New Reservation

Session Id : (System Generate)

45167802781

Establishments:

Location : (System Generate Once you have selected establishment)

Opening Hours : (System Generate Once you have selected establishment)

1: Monday, 2: Tuesday, 3: Wednesday, 4: Thursday, 5: Friday, 6: Saturday, 7: Sunday

Hi Hamsamalini Chandrasekaran ! IRA
welcomes you!

To do reservation
Key [m] to Main menu...



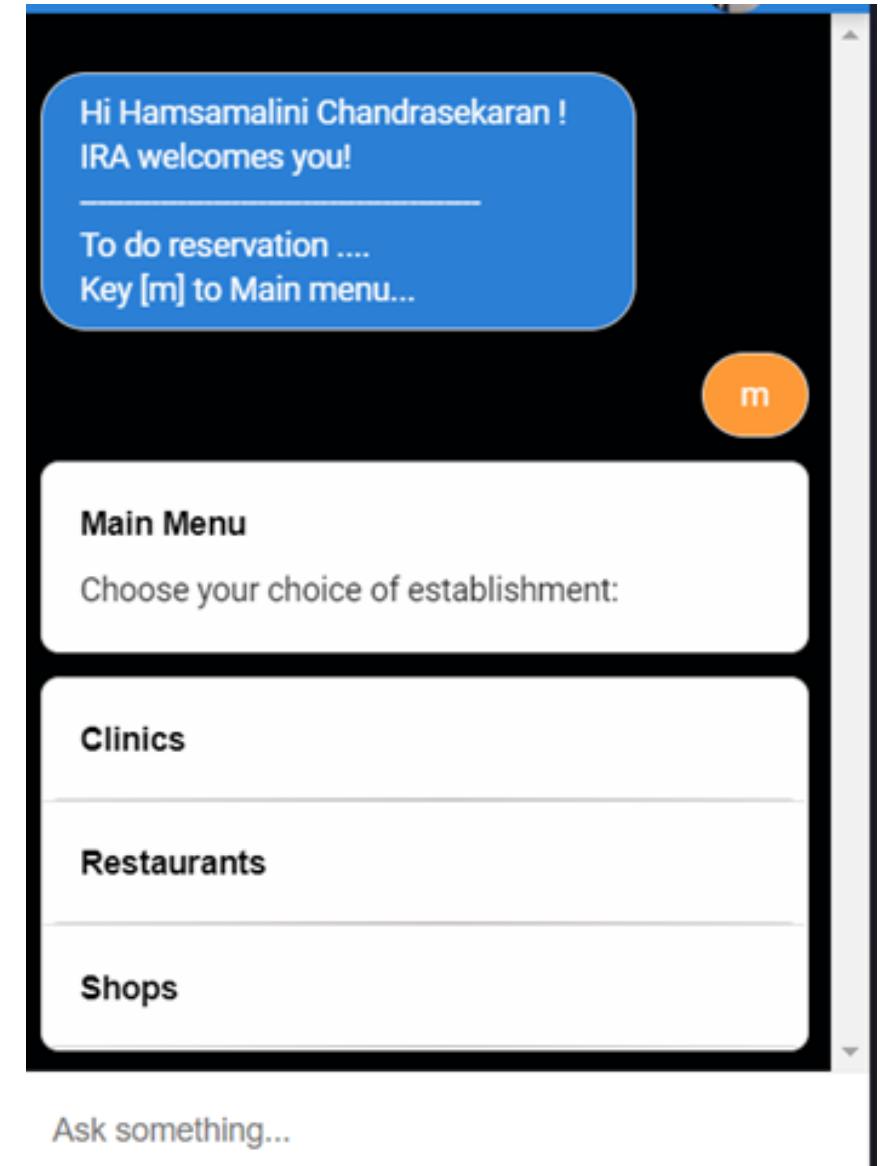
IRA ChatBot

- Patron signs in the app as a fresher. The bot welcomes the patron.
- Key 'm' or 'M' to the main menu which lists the establishment list.

IRA ChatBot

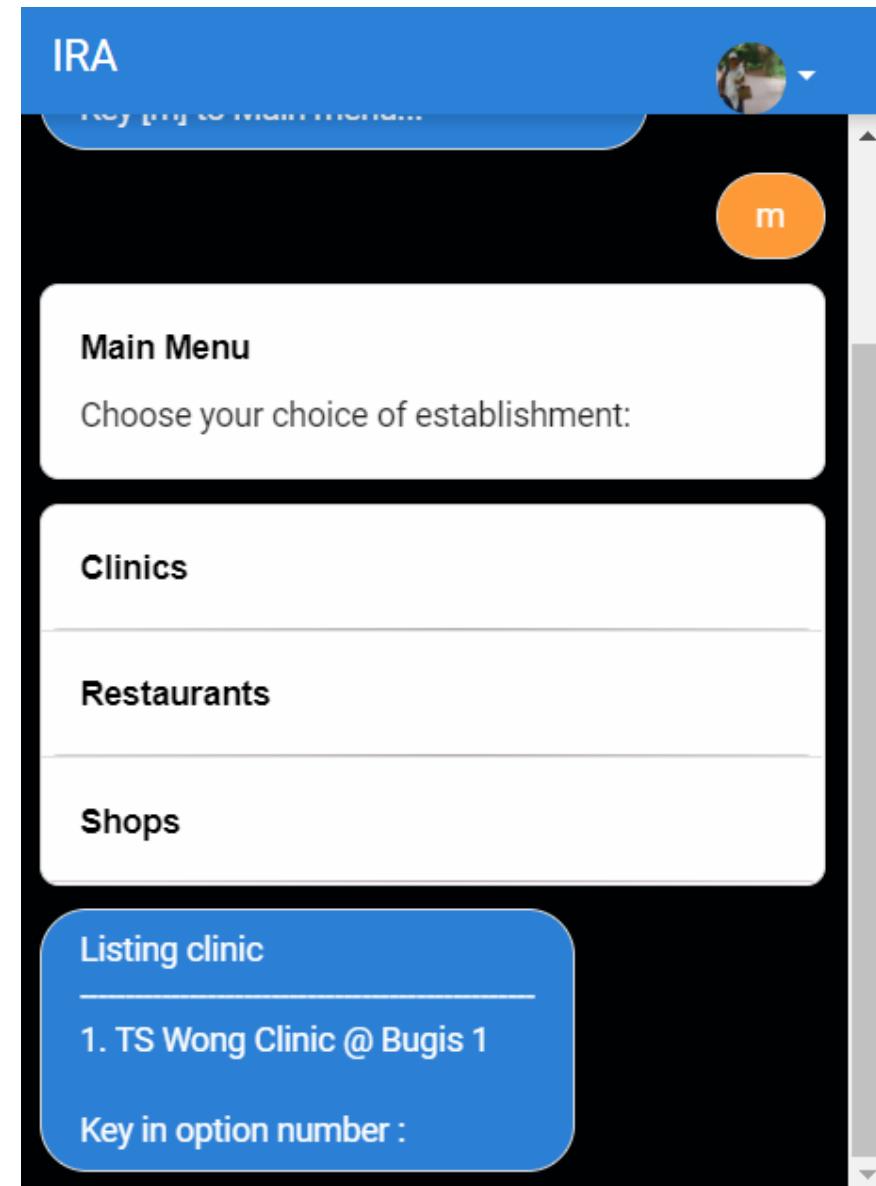
Establishment List

- Select your choice of establishment.



IRA ChatBot

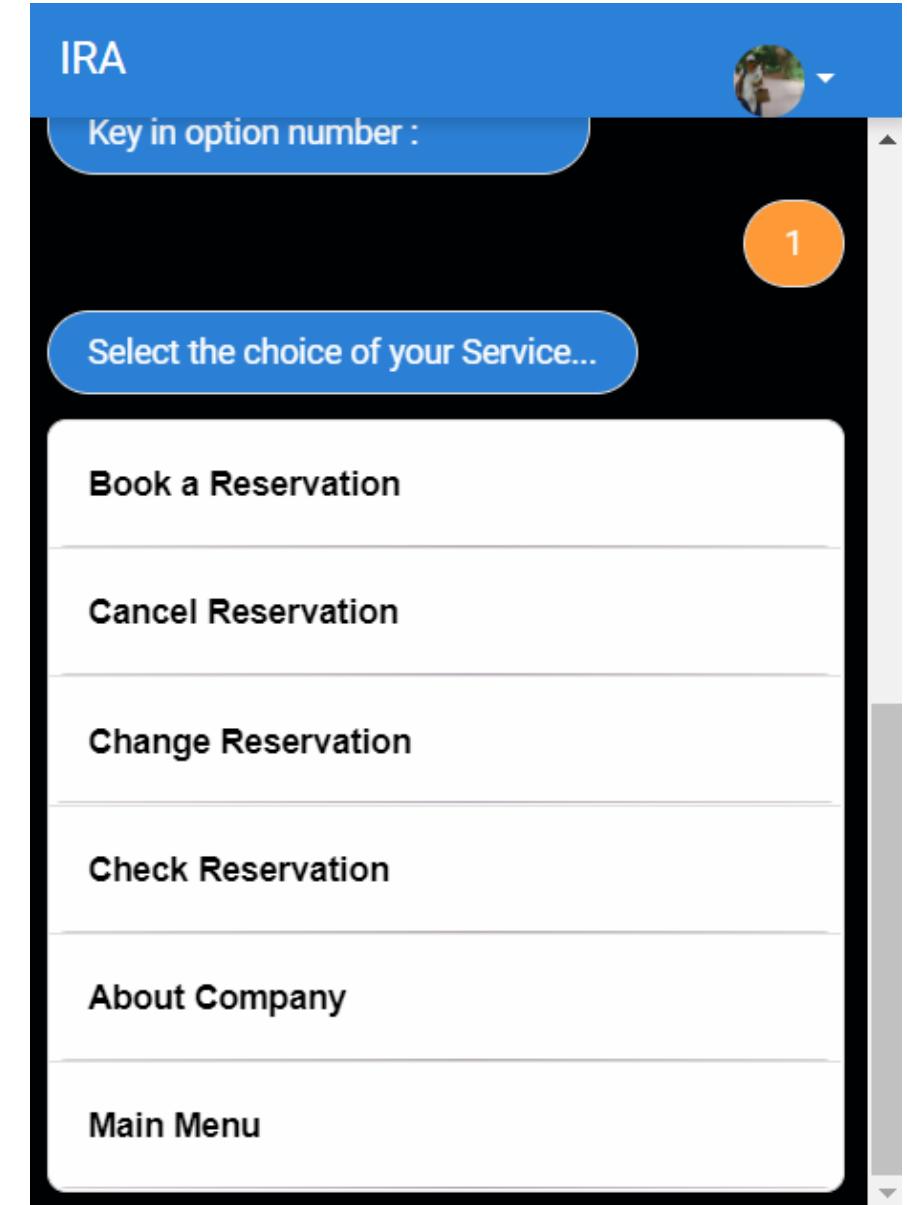
- Choose Clinics



Ask something...

IRA ChatBot

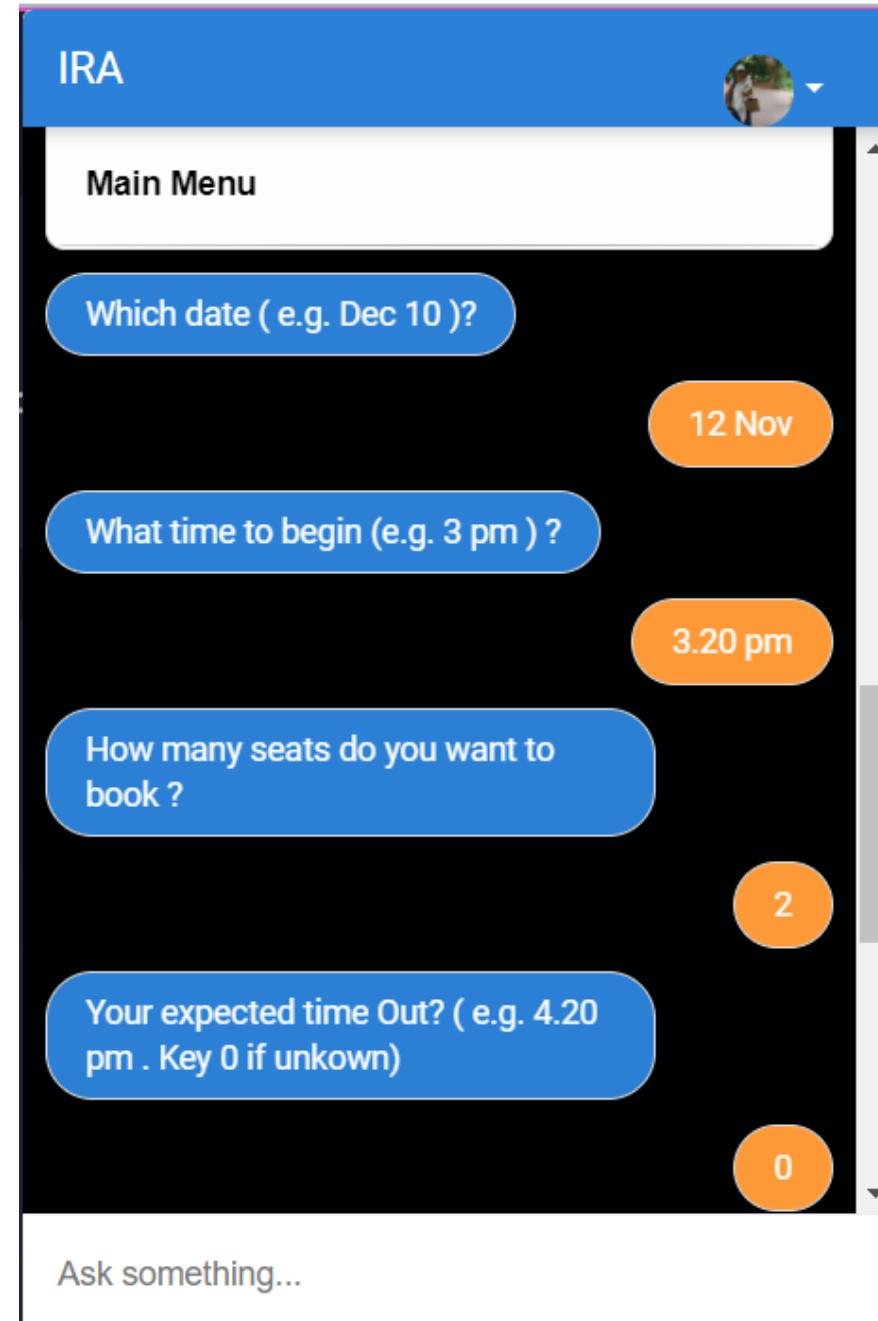
- Option 1 entered.
- Bot Services pops up



Ask something...

IRA ChatBot

- Select Book Reservation
- This option expects collecting details from the Patron on Date, timeStart, no of seats, and timeOut. If the Patron is not aware of timeOut, he/she can key in '0' or else key in the time in the specified format.
- The agent is trained with variable inputs by the patron to fill the slots for date, and time.
- For e.g,
 - **What time to begin?** Can receive 3.50 for 3.50 am/3.50am, 3pm or 3 pm
 - **What date?** Can receive – 12 Nov/ Nov 12/ Thursday



IRA ChatBot

- On receiving the details , the bot expects a confirmation from the patron. Key 'c' to confirm.

TS Wong Clinic @ Bugis 1 says :
You have requested for a
reservation on Thursday 12
November 2020 from 15:20 for 2
people.

Key [c] to confirm
Key [m] to Main menu

c

Time frame that fits your
preferences is Thursday 12
November 2020 at 15:20 to 15:30.
Please confirm if it's okay for you
Key [p] to proceed...

Key [m] to Main menu....

Ask something...

IRA ChatBot

- The bot expects an input 'p' to proceed with the given time frame. If not satisfied, the Patron can key in 'm' to the main menu
- On keying 'p', the bot returns the response as:
- The Patron will have to check if his reservation is confirmed after 7 pm on the day of reservation

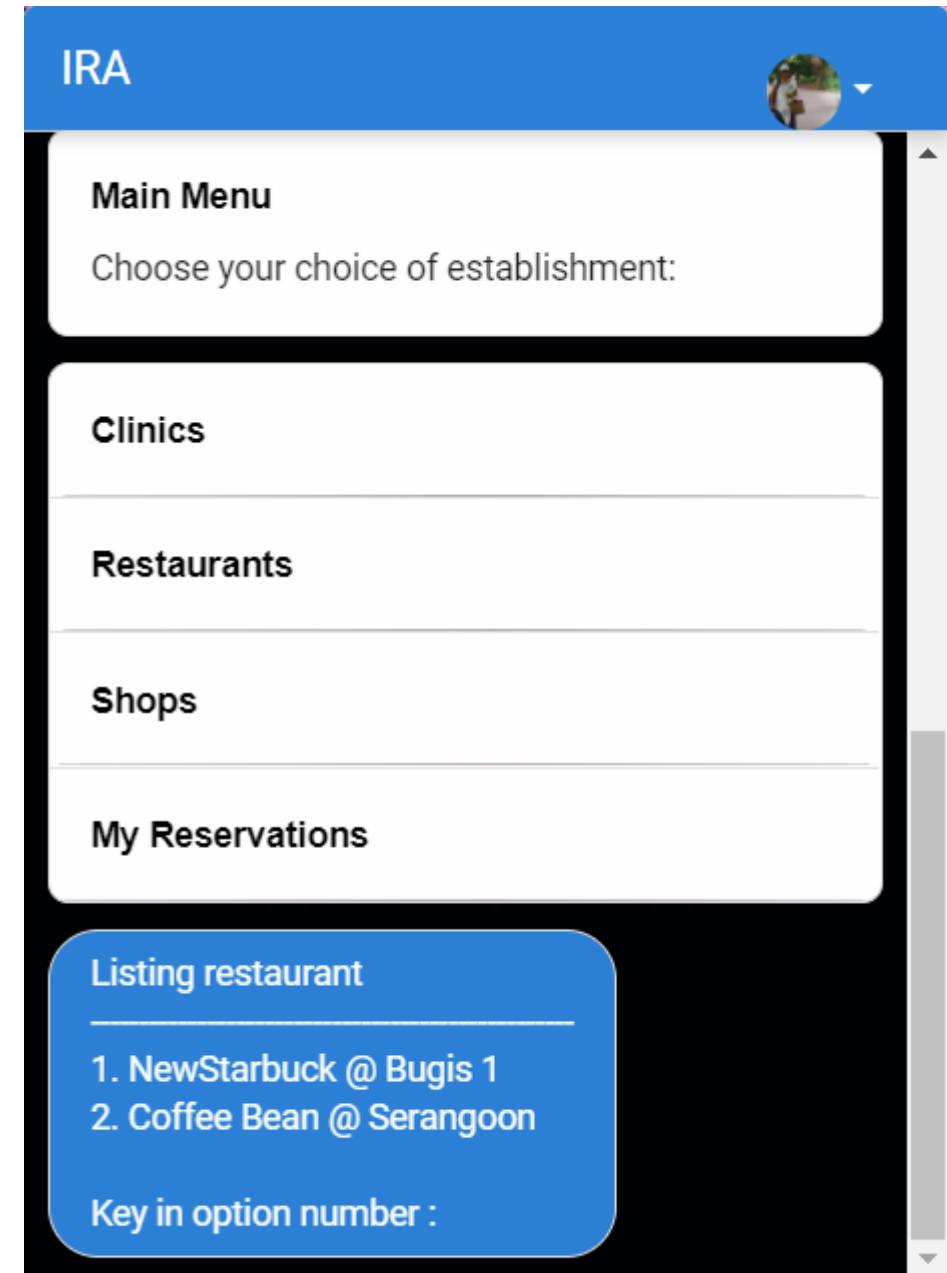
Your request for 2 person(s) on Thursday 12 November 2020 at 15:20 to 15:30 is now on-hold.
Please status check after cuoff time 19:00

Key [m] to Main menu....

[Ask something...](#)

IRA ChatBot

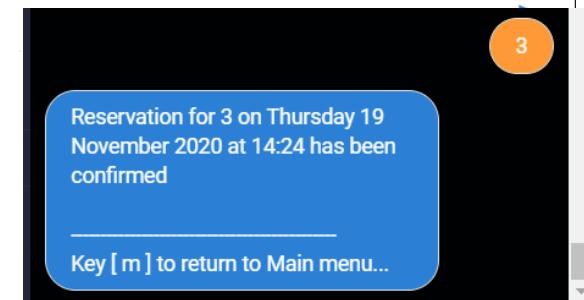
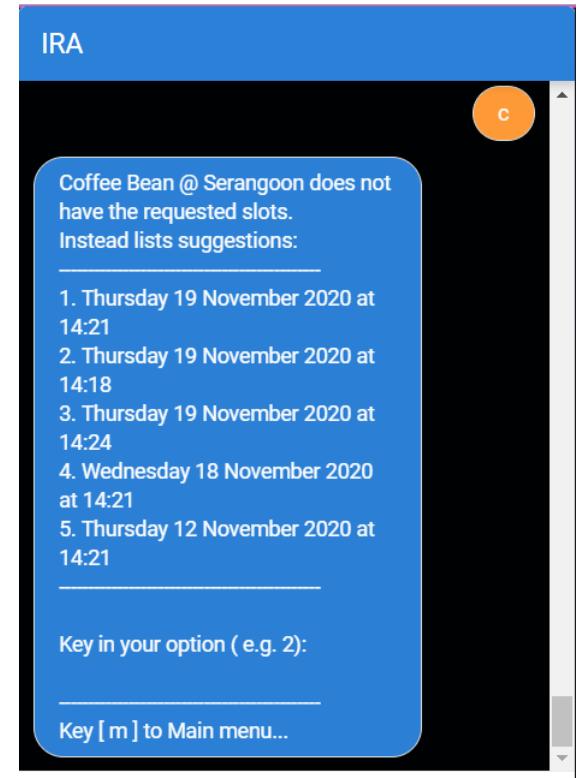
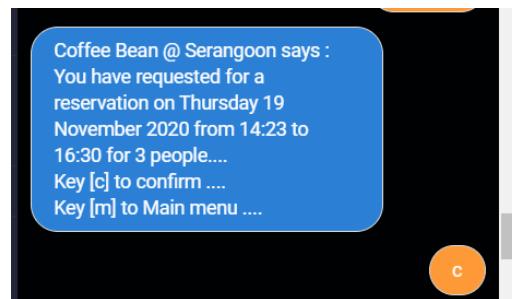
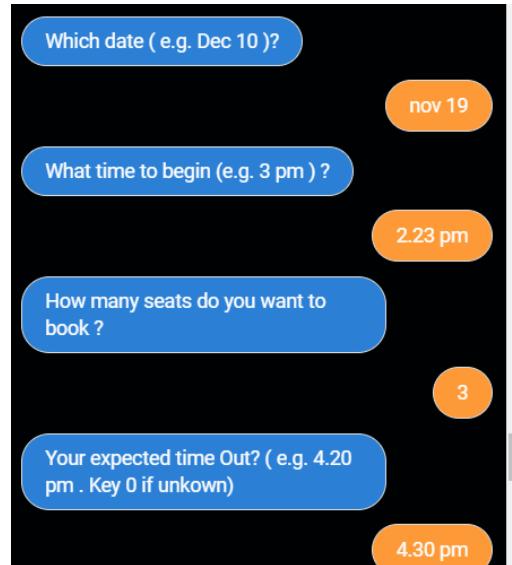
- Book Reservation with a Restaurant



Ask something...

IRA ChatBot

- On selecting Book Reservation and feed the inputs to Bot's prompts.
- The bot provides a suggestion list. Selecting the option from suggestion list, the bot **confirms** reservation



ISS IRS PROJECT TEAM

- DASHBOARD
- MAPS
- USER PROFILE
- PAST HISTORY
- SUPPORT

Upcoming Reservation

NO	RESERVATION ID	TIME	SHOP	ADDRESS	CONTACT	QTY	MODIFY	CANCEL	STATUS
1	42805739	20/11/12_15:20	TS Wong Clinic	Bugis 1	93112233	2			
2	42805739	20/11/19_14:24	Coffee Bean	Serangoon	65930328	3			
3	42805739	20/11/17_12:57	Coffee Bean	Serangoon	65930328	3			

Hi Harsamalini Chandrasekaran ! IRA welcomes you!
Your upcoming reservation status...

Establishment: TS Wong Clinic
No. of Person(s) :2
Time in :20/11/12 at 15:20
Status :on-hold

Establishment: Coffee Bean
No. of Person(s) :3
Time in :20/11/19 at 14:24
Status :confirmed

Establishment: Coffee Bean
No. of Person(s) :3
Time in :20/11/17 at 12:57
Status :confirmed

Key [m] to Main menu...

New Reservation

Session Id : (System Generate)
22022055290

Establishments:



- Log out by Patron and Log in again
- If Patron logs out and logs in, the bot welcomes the Patron with upcoming reservations as

IRA ChatBot

IRA ChatBot

- Book a reservation for tomorrow

The screenshots illustrate a conversation with the IRA ChatBot to book a reservation for tomorrow.

Screenshot 1: The bot asks "Select the choice of your Service...". The user has selected "Book a Reservation".

Screenshot 2: The bot asks "What time to begin (e.g. 3 pm) ?". The user responds with "5 pm".

Screenshot 3: The bot asks "How many seats do you want to book ?". The user responds with "5".

Screenshot 4: The bot asks "Your expected time Out? (e.g. 4.20 pm . Key 0 if unknown)". The user responds with "0".

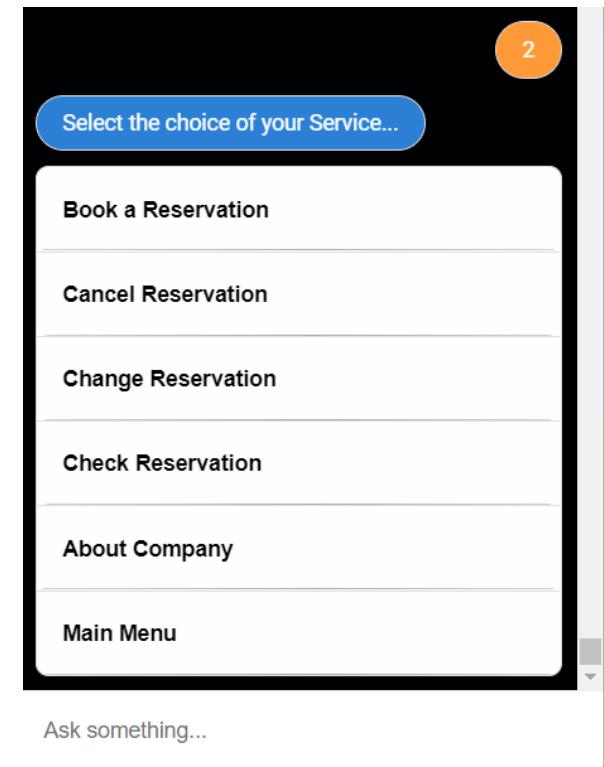
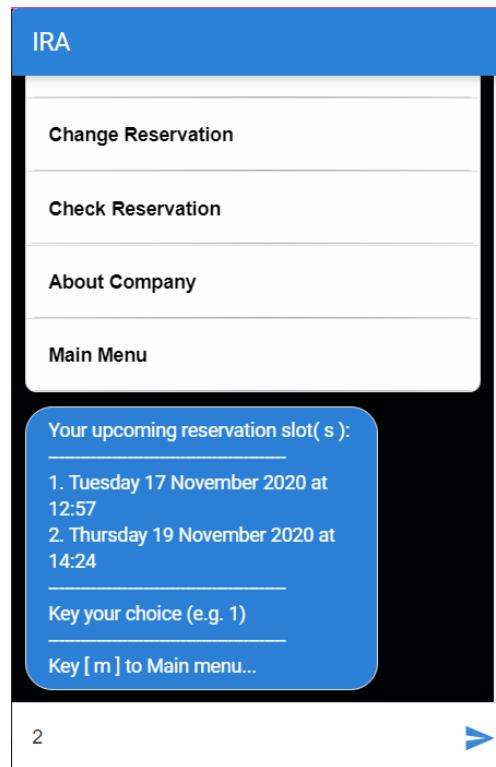
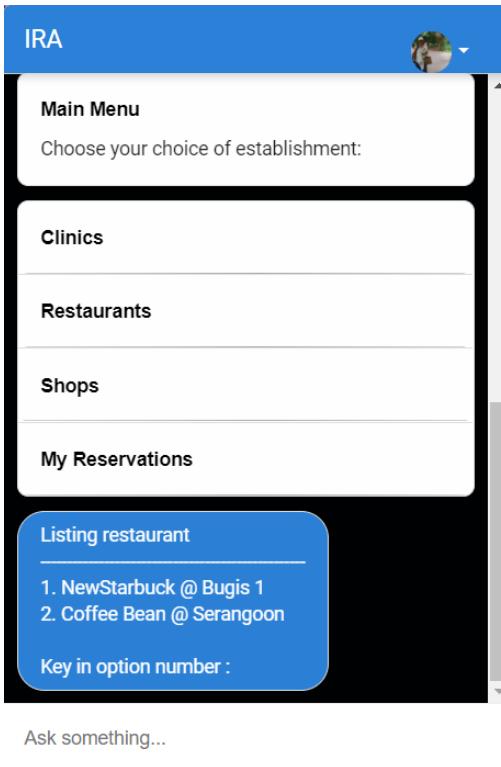
Final Response: The bot confirms the details: "A-look Spec @ Woodland Avenue2 says : You have requested for a reservation on Sunday 8 November 2020 from 17:00 for 5 people." It also provides key instructions: "Key [c] to confirm" and "Key [m] to Main menu".

Bottom Prompt: "Please make reservation 3 day(s) in advance" and "Key [m] to Main menu...".

Bottom Input: "Ask something..."

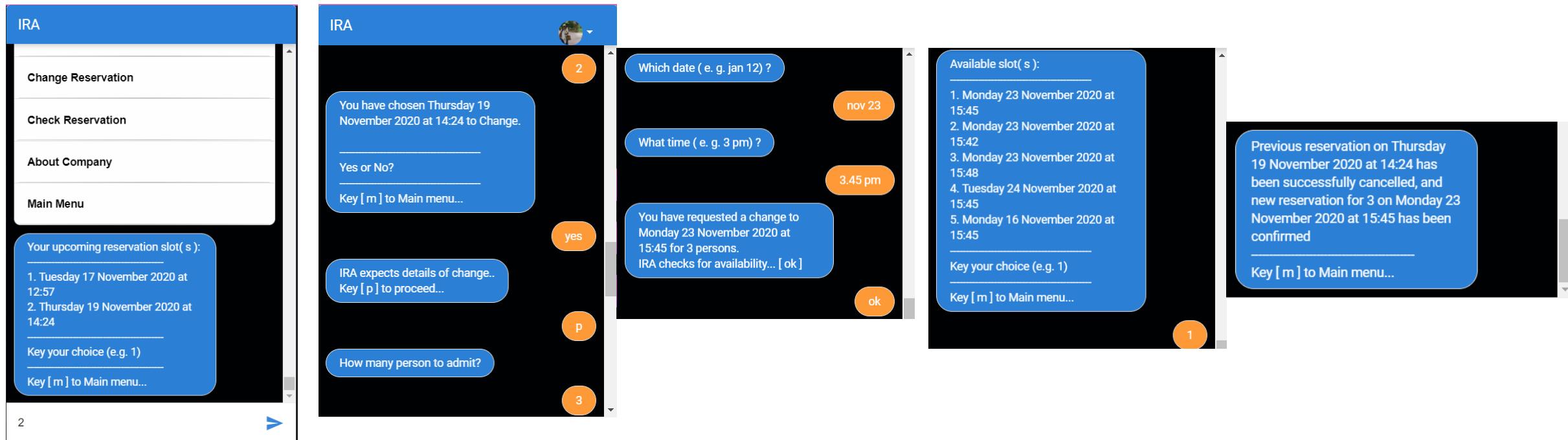
IRA ChatBot

- Change Reservation



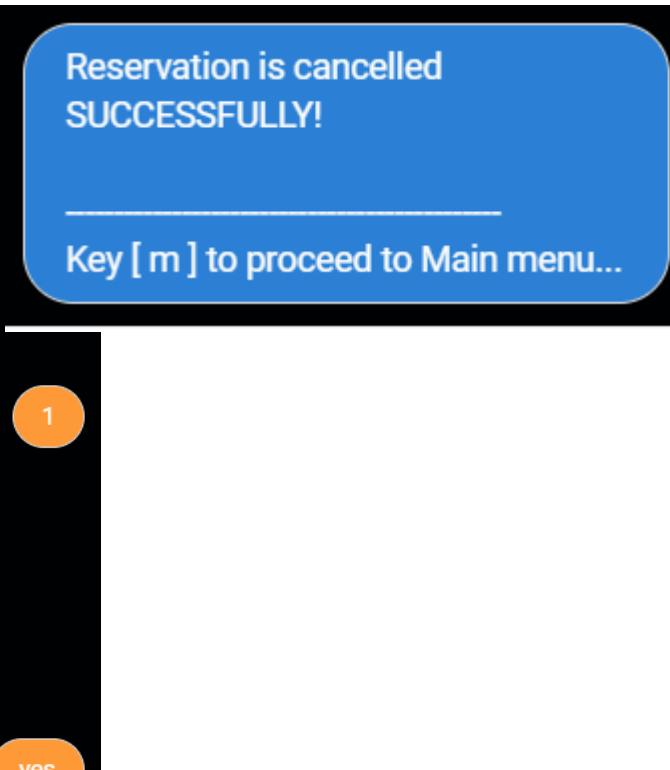
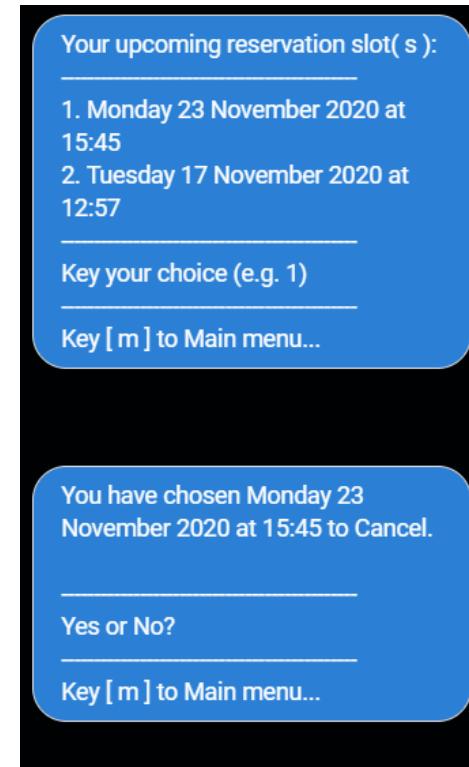
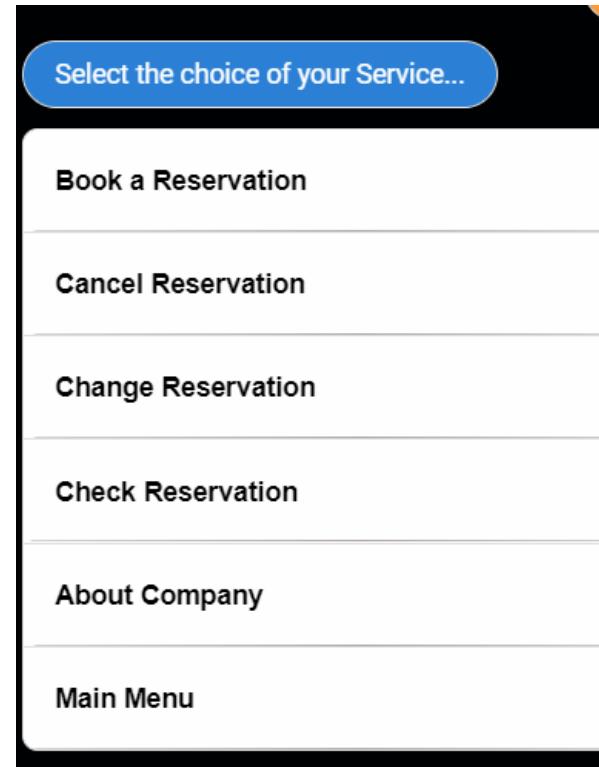
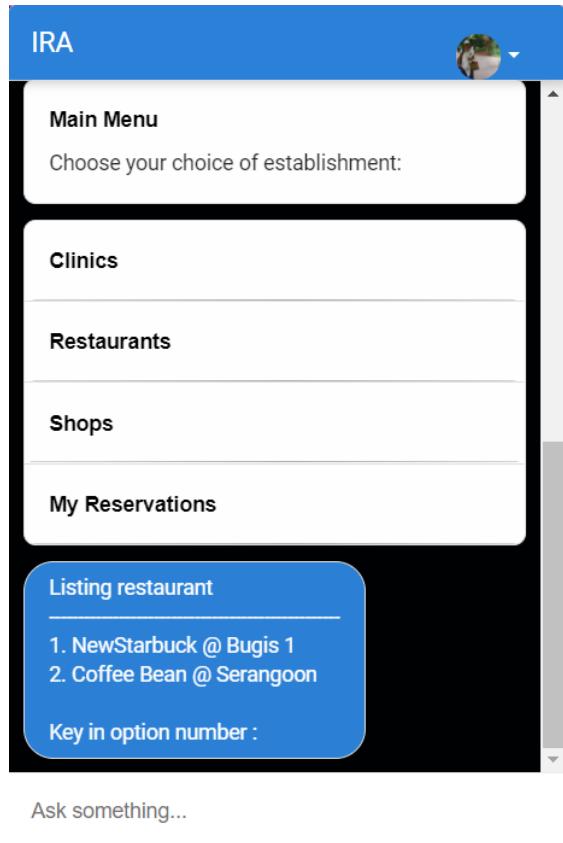
IRA ChatBot

- Select Change Reservation. The bot lists the upcoming reservation slots. The Patron selects the slot to change.
- On selecting the option from suggestion list, the bot responds **confirmation** as ,



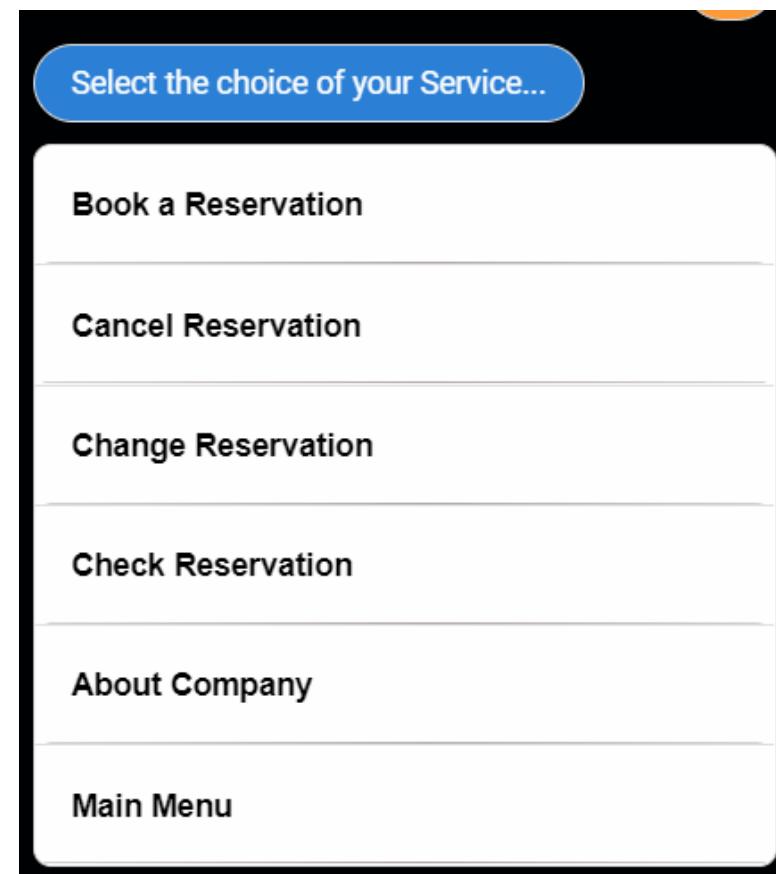
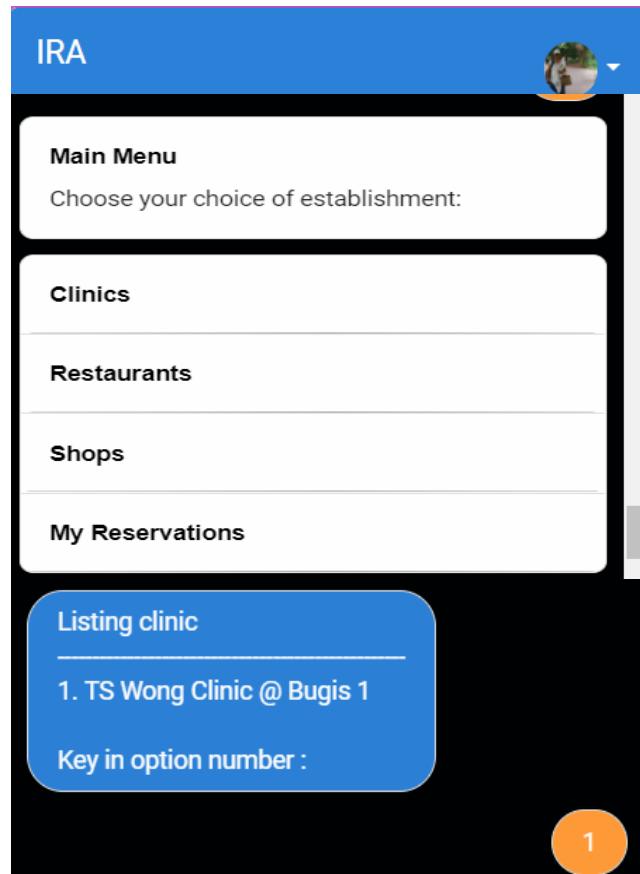
IRA ChatBot

- Cancel Reservation



IRA ChatBot

Check Reservations with Clinics

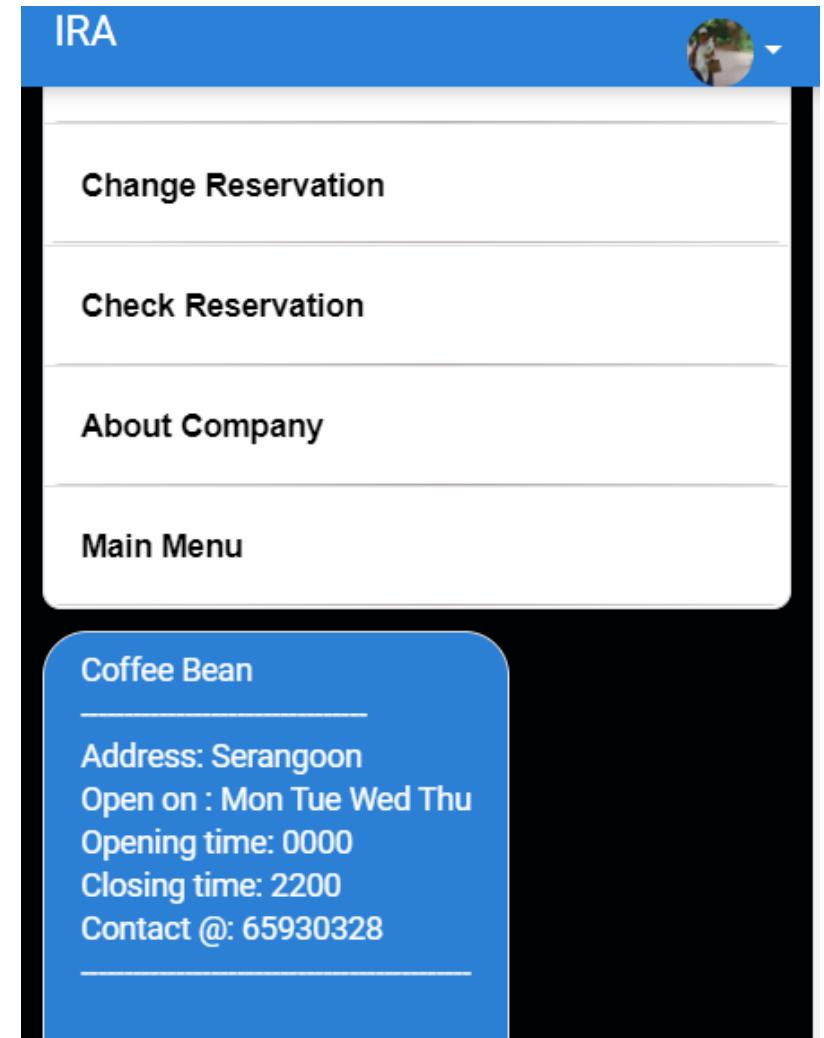


You have these reservation(s):
(1) Thursday 19 November 2020 at
11:20 to 12:10 for 3 person(s) is on-
hold
(2) Thursday 12 November 2020 at
15:20 to 15:30 for 2 person(s) is on-
hold

Key [m] for Main menu...

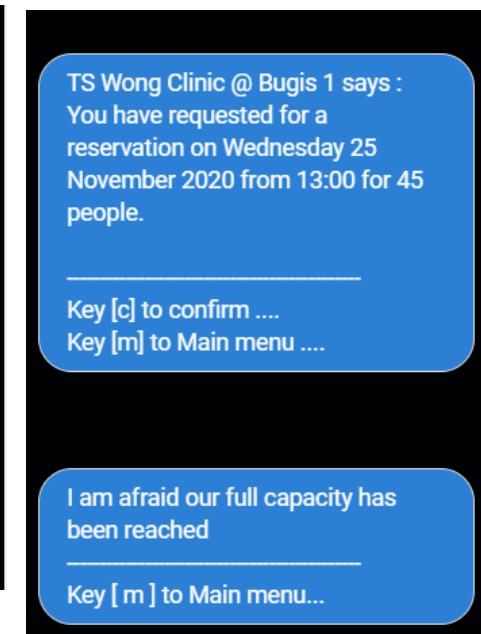
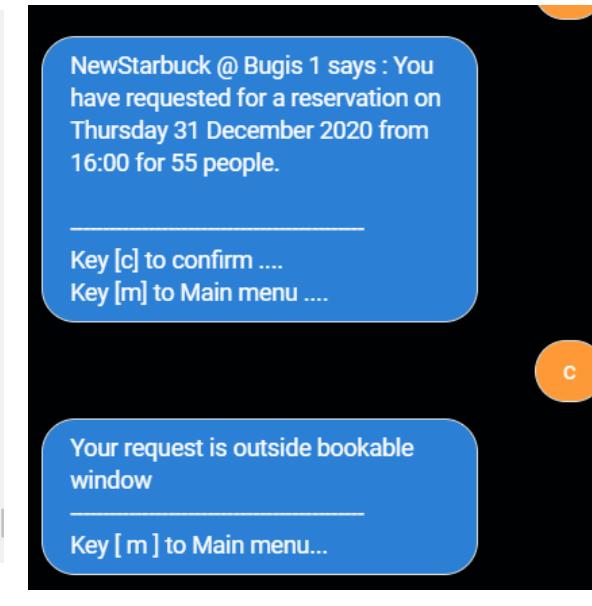
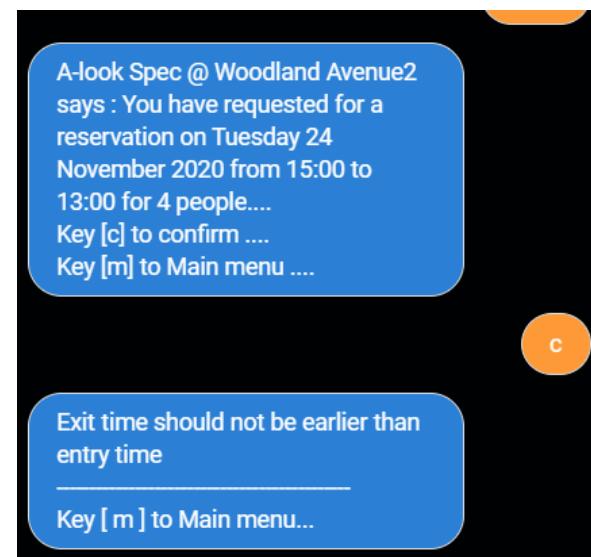
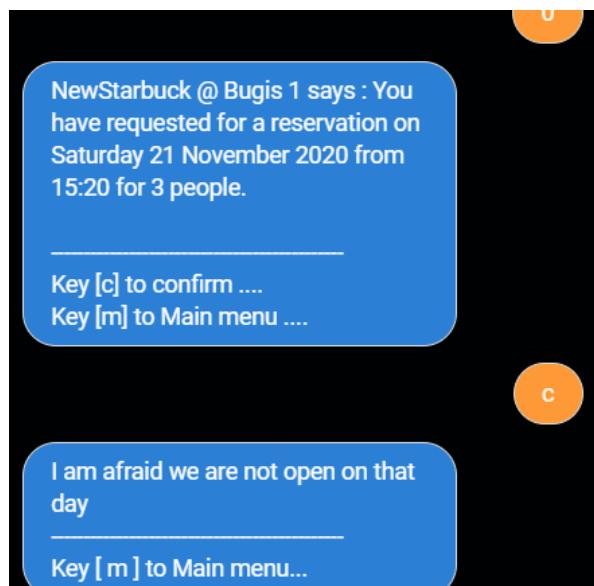
IRA ChatBot

About Company



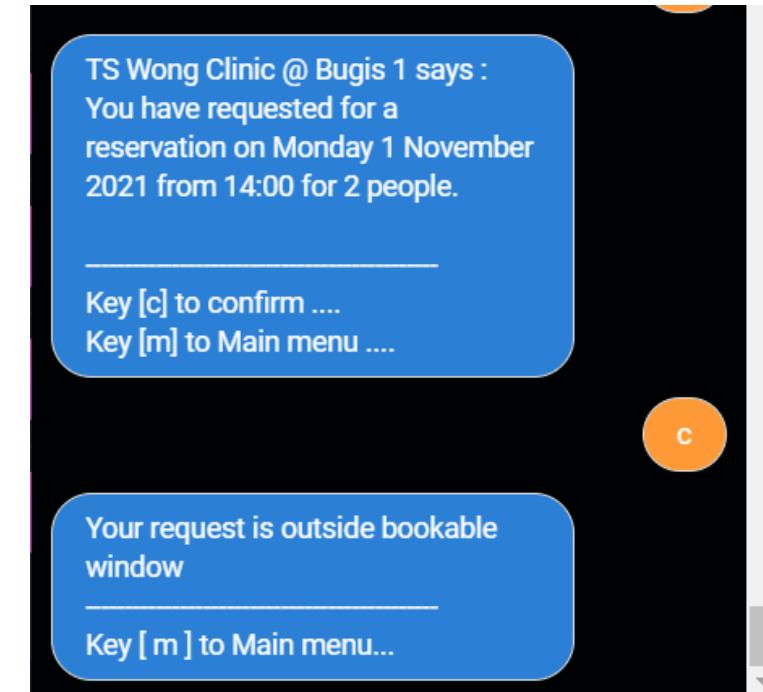
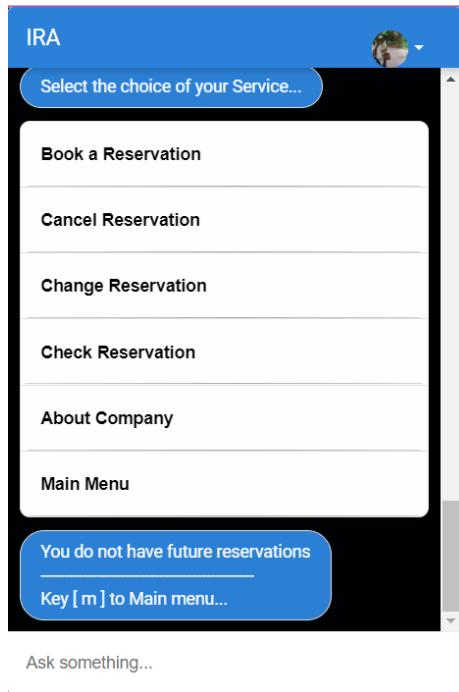
IRA ChatBot: Follow up with Rules

- Booking a slot on a closed day is identified by Bot
- Bot identifies error when timeout is less than time start
- Bot identifies booking a slot on a longer plan
- Bot identifies when number of seats are beyond limit



IRA ChatBot: Follow up with Rules

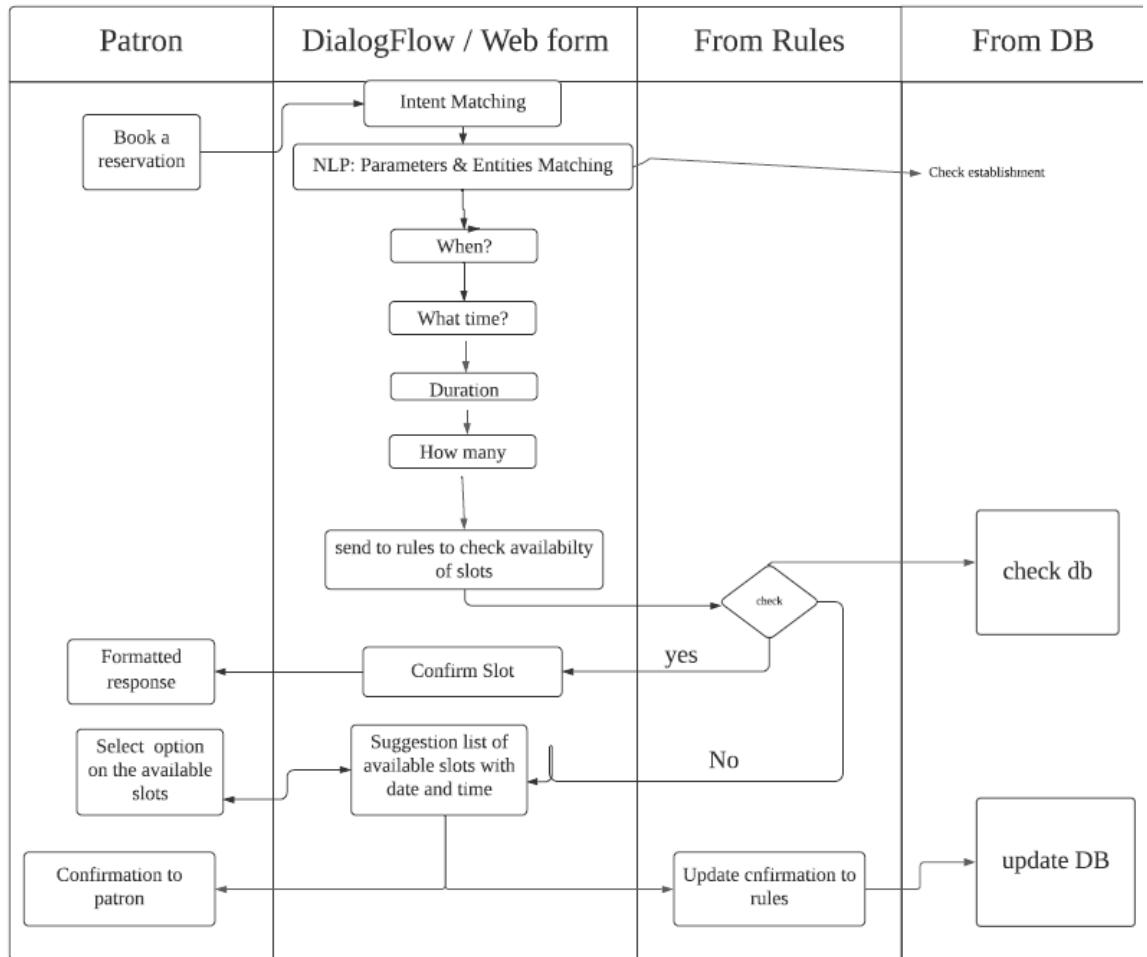
- When Cancel/change reservation is selected before booking any slots
- Booking a reservation for past date



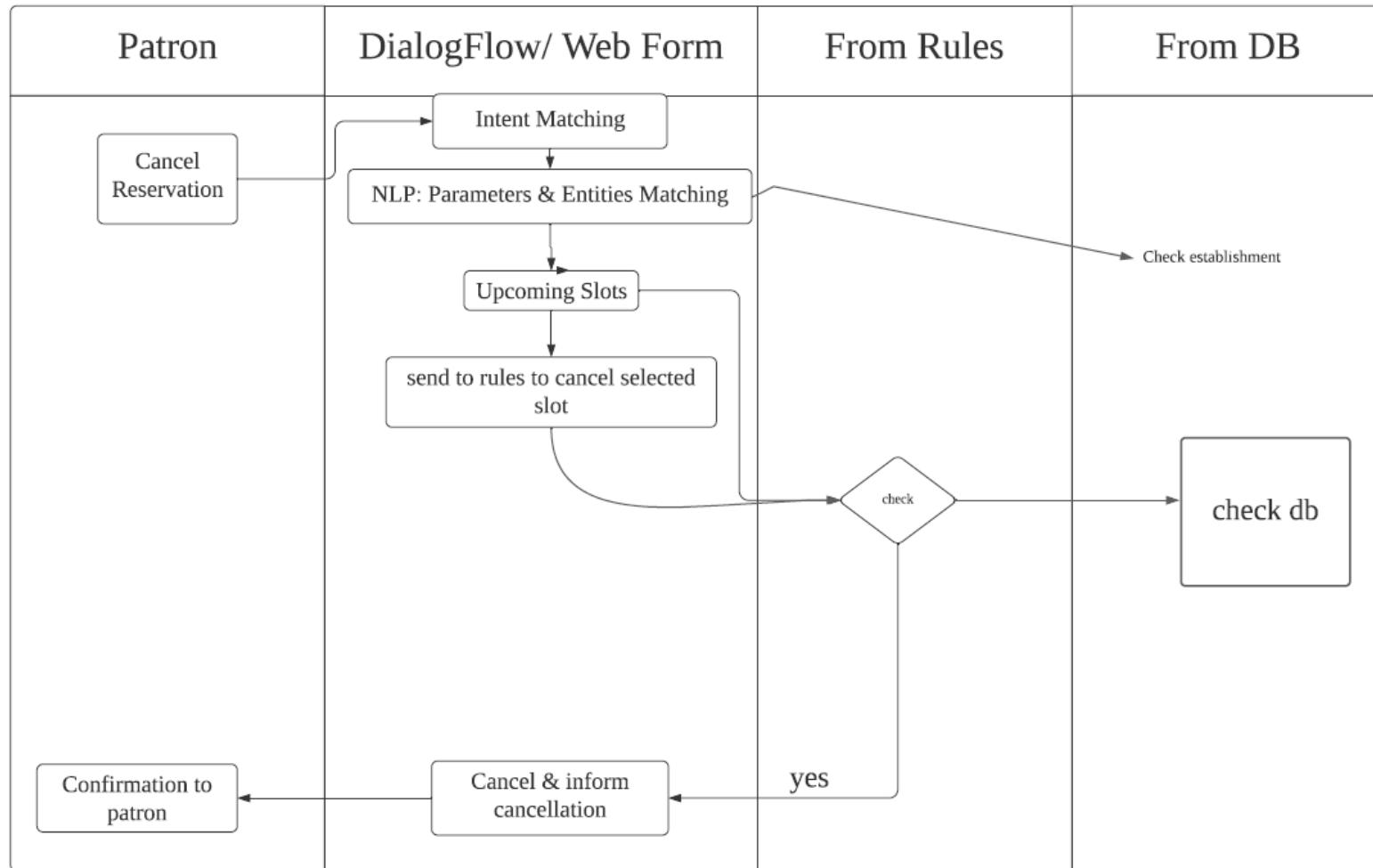
Appendices

Reservation Activity Workflow

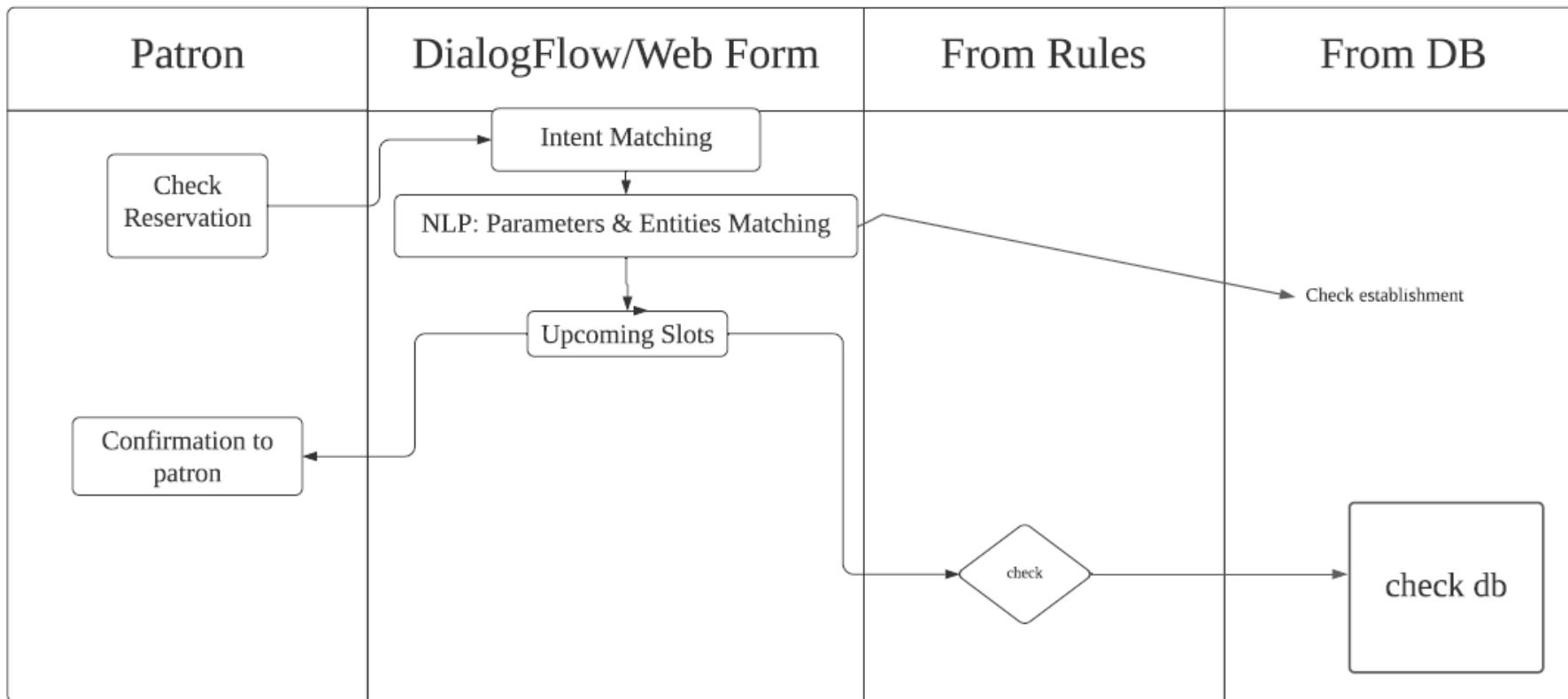
Book a Reservation

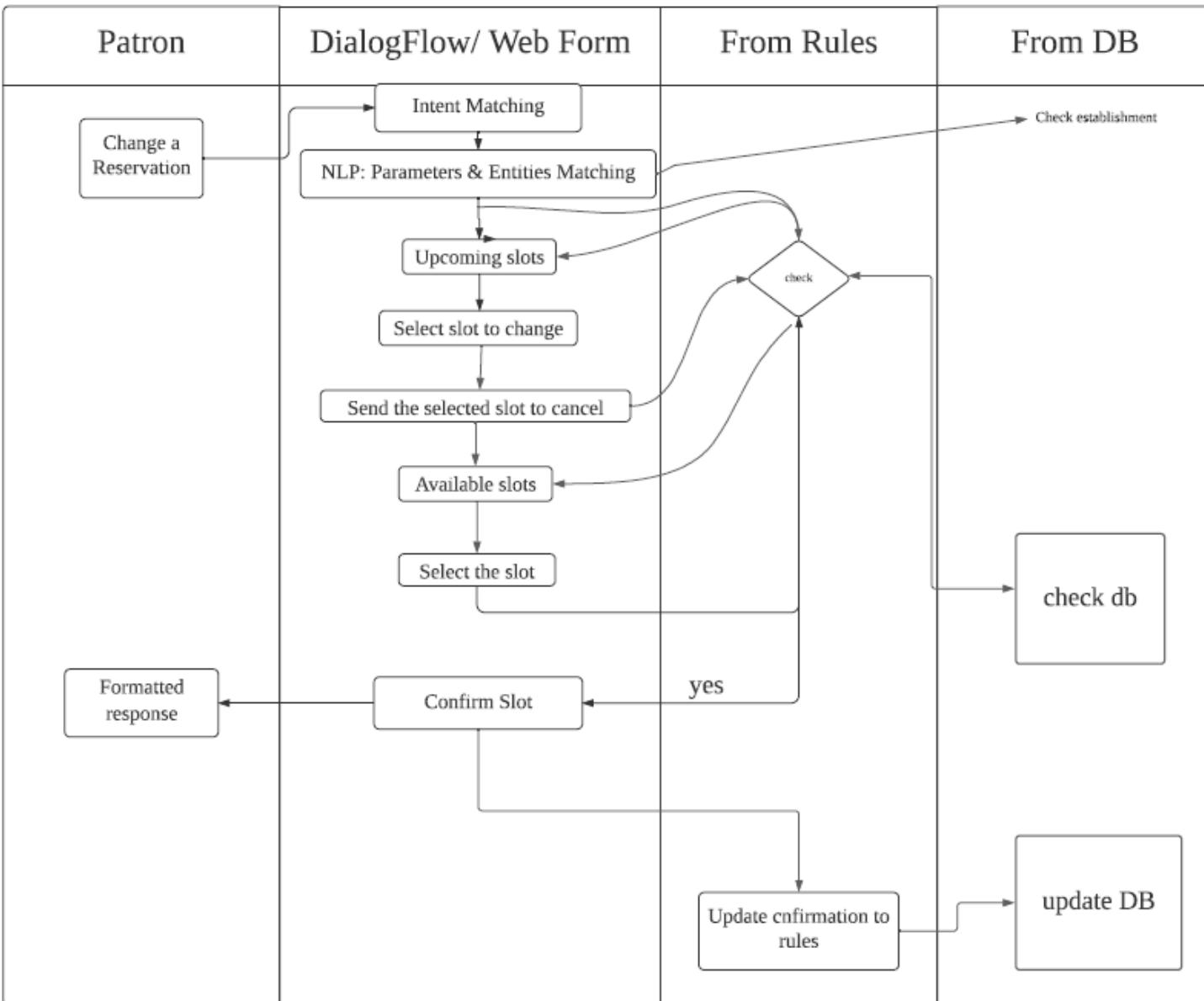


Cancel Reservation



Check Reservation





Change Reservation