SNAPYUMMY

Intelligent Cooking Assistant

User Guide

Intelligent Reasoning Systems

Practice Module

Semester One 2021/2022

PREPARED BY:

Student Name	Student ID
Chen Ziqi	A0231425R
Li Peifeng	A0231447J
Mediana	A0231458E
Xu Xuanbo	A0231436M

Contents

1 Objectives

The objective of this document is to provide an overview of SnapYummy application and the necessary information to use the application. The manual assumes that the reader has sufficient understanding on system implementation, machine learning, programming language (Python), knowledge reasoning and representation.

2 Scopes

The high-level scope of the user guide will encompass THREE (3) sections:

1. System Overview
2. Installation and Configuration
3. User Manual (Use Case)

3 System Overview

Figure 1 shows the system overview for SnapYummy. Following are the components used in SnapYummy.

1. Telegram – Chat Messaging Platform for interaction between SnapYummy and users
2. Yolov5 – Object detection to detect the ingredients uploaded by users
3. DialogFlow – Intent detection to detect users' request and intention
4. Neo4J – Knowledge graph to search for the search the recipe according to users' requirement

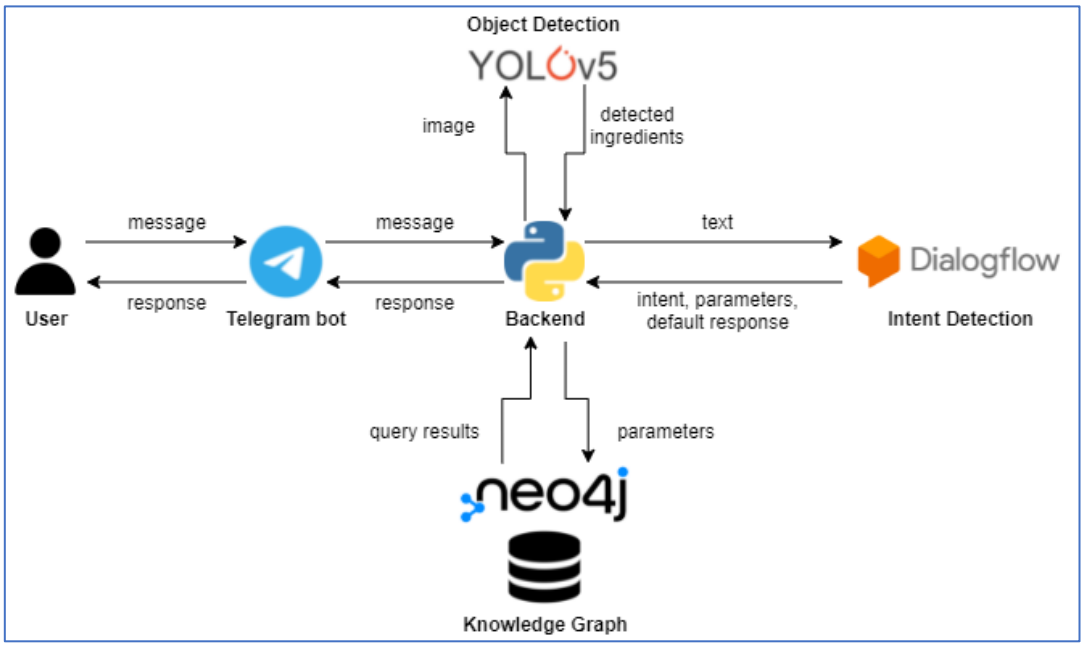


Figure 1 System Overview

4 Installation

4.1 Requirements

Description	Specification
Hardware	CPU: Intel(R) Core(TM) i5-10210U CPU @ 1.60GHz or higher GPU: *Optional RAM: 8GB or bigger Hard disk: 1GB or bigger
OS / Software	OS: Windows 10 Software: Python3.7, Docker (for Neo4j library & data)
Packages	We have included all packages needed in the requirements.txt, please use 'pip install' command to install them.

4.2 Yolo Setup and Configuration

Minor setup and configuration are required for YOLOv5. The official YOLOv5 codes and our self-trained weights are included in the project and integrated. The backend script (reqHandler.py) will automatically initialize the model when it is executed and call the model when object detection is needed.

4.3 Neo4J Setup and Configuration

4.3.1 Docker Installation

No	Steps
1	Go to Docker[1] official website to install a Windows version of Docker. For the backend. Use WSL-2.
2	By default, the docker will be installed on your C: drive. If you want to move the data to other drive (like D:), you can refer to this Windows 10 How to change Docker's Image Directory[2]
3	Open the 'cmd' consoler and type 'docker' to check whether you have successfully installed it.

4.3.2 Pull the Docker Image

We have pushed the neo4j docker to Dockerhub[3].

[1] Docker - https://docs.docker.com/desktop/windows/install/
[2] Windows 10 How to change Docker's Image Directory - https://www.jianshu.com/p/e79f4c938000
[3] Dockerhub - https://hub.docker.com/r/scnujackychen/neo4j

Use `docker` **`pull scnujackychen/neo4j`** to pull it down to local. Use **`docker images`** to check your local images.

4.3.3 Download the Data Volume

Download the data volume from GDrive[4], unzip the file into **`/home`** directory (you can create it on any directory, e.g `D:/nus/home/neo4j`)

4.3.4 Create Container

```
docker run -d
--name food-db
-p 7474:7474
-p 7687:7687
-v D:/NUS/project/home/neo4j/data:/data  # must be absolute path
-v D:/NUS/project/home/neo4j/logs:/logs
-v D:/NUS/project/home/neo4j/conf:/var/lib/neo4j/conf
-v D:/NUS/project/home/neo4j/import:/var/lib/neo4j/import
--env NEO4J_AUTH=neo4j/password
scnujackychen/neo4j:4.3.3-community
```

Some explanations:

`-v` means the docker container will create a share folder and mount it to your local file directory. (e.g local directory **`D:/NUS/project/home/neo4j/data`** is linked to docker container directory **`/data`**)

name and password can be modified

Use **`docker ps -a`** to check whether you have created the container.

Use **`docker start (container ID)`** to start the container.

If everything goes smoothly, you can go to **`localhost:7474`** to check.

[4] GDrive - https://drive.google.com/drive/folders/1z7rn_hHrOlS1q0aXTqbiMss9_tNzLufG?usp=sharing

4.4 Telegram Setup and Configuration

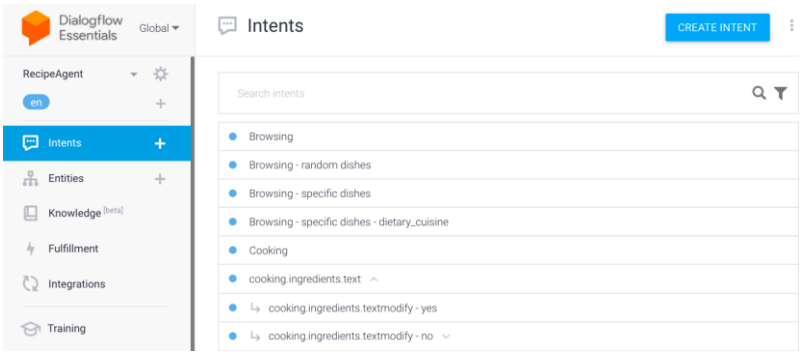
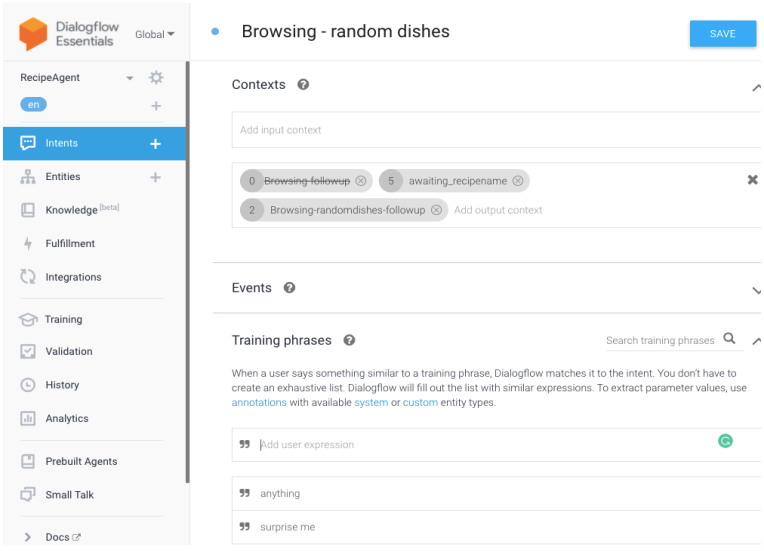
4.4.1 Generate Telegram Token

Telegram token or key is managed by *BotFather,* the token is required to connect between backend server and telegram. Below are the steps to obtain the telegram token.

No	Steps
1	Go to your Telegram account, and type BotFather in the search bar.
2	Click command /newbot to create a new bot
3	Type a name and username for your bot. If the username is already taken, BotFather will prompt you to change to another available username
4	After successfully choose a username, BotFather will provide the Telegram token along with other information.
5	Save the token and input into the backend script (refer to 4.6)
6	In the BotFather chat window, you may also click /setcommands to change the list of commands

4.5 Google Dialogflow Setup and Integration

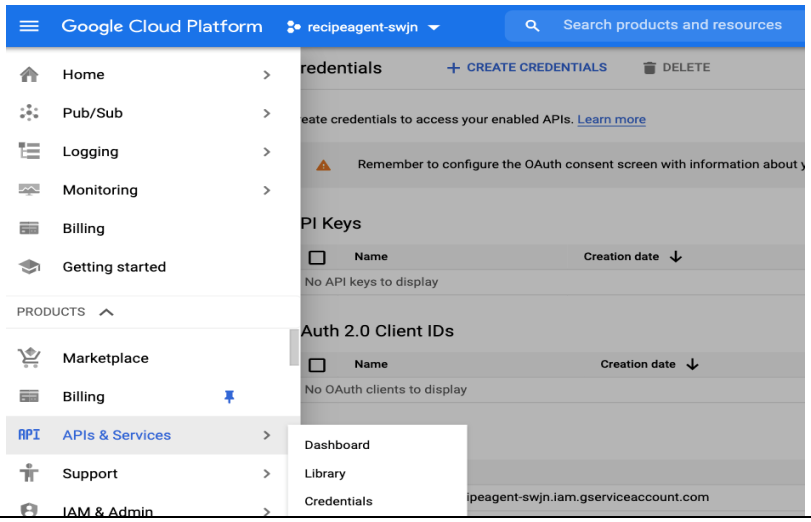
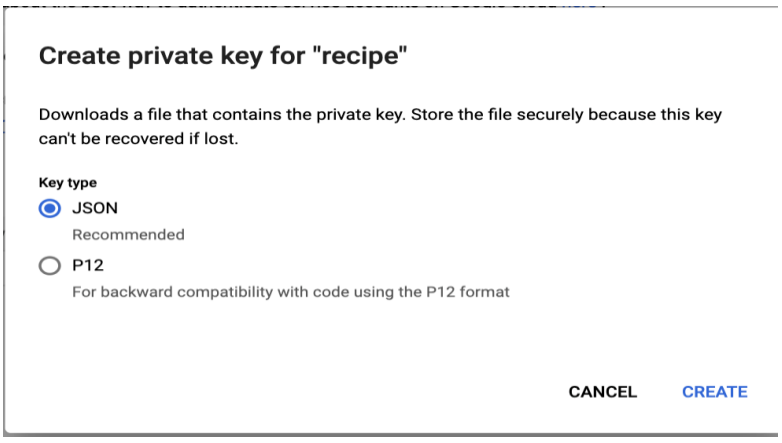
4.5.1 Build a Dialogflow Agent

No	Steps
1	Go to Dialogflow[5] and click Create new agent in the left sidebar menu
2	Choose a name for your virtual agent, set the default language, and click on Create
3	Click Intents in the left sidebar menu. Input the name of the Intents and click Create Intent 
4	Input the name of the Intent, Contexts, Training Phrases, Action and Parameters and Responses according to the use case. You may refer to Project Report for more details and examples. 
5	Alternatively, you may download the RecipeAgent (DialogFlow) from Github SystemCode/DialogFlow/RecipeAgent [6]

[5] DialogFlow - https://dialogflow.cloud.google.com/
[6] Project Github - https://github.com/SCNUJackyChen/IRS-PM-2021-11-07-IS03FT-GRP8-SnapYummy

4.5.2 Generate Google Dialogflow API Key

For backend server to reach Google Dialogflow.

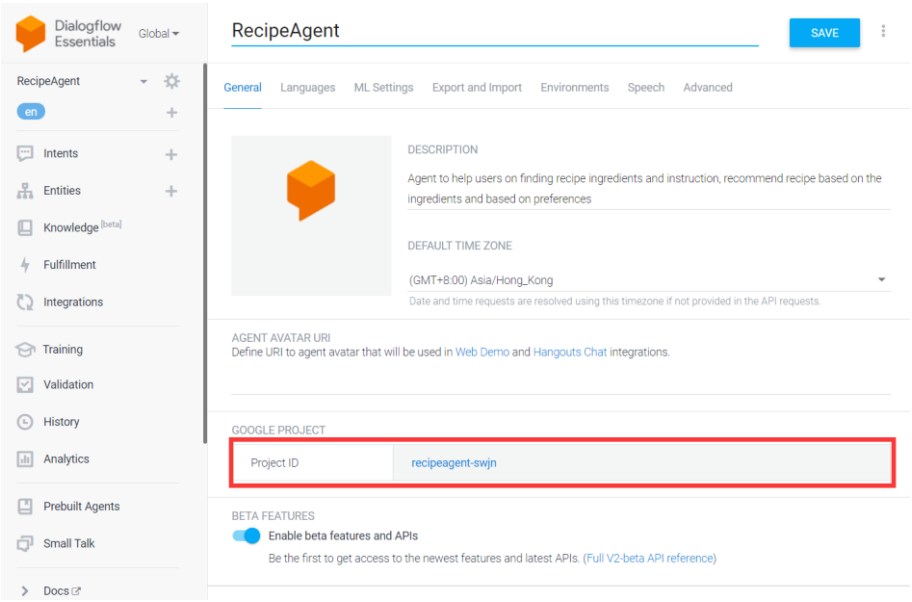
No	Steps
1	Go to Google Cloud Platform[7], click APIs & Services and then click Credentials in the left sidebar menu 
2	In the Credentials page, click Create Credentials and choose Service Account.
3	Input the service account name and description. Service account ID will be auto populated. Then click Create and Continue.
4	Grant the service account access to project. Select a role for this service account, example Owner or Editor. Then click Done
5	Under Actions, click Manage keys to generate API key for the created service account. Choose key type JSON. 
6	Save the JSON API key and input into backend server

[7] Google Cloud Platform - https://console.cloud.google.com/

4.6 Backend Server Setup and Configuration

To setup the backend server, you need:

1. Use 'git clone' command to download the project from the following URL:
   https://github.com/SCNUJackyChen/What2Cook
2. Open 'reqHandler.py' in the root directory of the project with any IDE.
3. At line 15, set '**telegram_botTOKEN**' to be the token you get in 4.4.1.
4. At line 14, set '**df_agentID**' to be the name of the Dialog agent you created in 4.5.1. You can find its name in the setting page:



5. At line 16, set '**os.environ["GOOGLE_APPLICATION_CREDENTIALS"]**' to be the absolute path of the JSON API key you saved in 4.5.2.
6. Run 'reqHandler.py', then you can now chat with the Telegram bot (ref to 5).

5 User Guide

5.1 Use Case Overview

SnapYummy provides 2 modes, cooking and browsing. In cooking mode, SnapYummy provides the recipe to cook according to users input, ie ingredients, cuisine preference and dietary preferences. For ingredients input, users may choose to input via image or via text. When users input image, SnapYummy will use its object detection mechanism powered by Yolov5 to detect the objects. This feature enables users to just snap a photo of their refrigerator easily and inform SnapYummy on the ingredients that users have. When users are unable to snap a photo, they may also just type-in their ingredients in text form.

The second mode that users may interact with SnapYummy is browsing mode. In this mode, users may browse recipe in two ways, leisure browsing and specific browsing. Leisure browsing is for users who do not have any idea on cooking and just like to browse on available recipe for getting ideas. While specific browsing is for users who are performing leisure browsing, but with specific cuisines and dietary preferences. This is useful for users who are going to host a party for family or friends with different preferences.

Following are the specific cuisines list and dietary list provided by SnapYummy.

5.1.1 Cuisines List

Cuisine			
Nigerian	Swedish	Australian	Filipino
Lebanese	Pennsylvania Dutch	South African	Turkish
Portuguese	Ethiopian	Greek	Tex Mex
Belgian	Cajun	Southern_Us	Swiss
Czech	Cajun_Creole	Caribbean	Austrian
Finnish	European	Italian	Dutch
South American	Hawaiian	French	Egyptian
Costa Rican	Canadian	German	Danish
Moroccan	Welsh	Vietnamese	Japanese
New Zealand	Georgian	Indonesian	British
Thai	Russian	Hungarian	Chinese
Asian	African	Indian	Pakistani
Irish	Malaysian	Norwegian	Iraqi
Puerto Rican	Creole	Korean	Jamaican
Native American	Mexican	Brazilian	Cuban
Palestinian	Spanish	Scottish	Christmas

5.1.2 Dietary List

Five entries are created for dietary entity including vegetarian, halal, eggetarian, fruitarian and non-vegetarians. Each entry is defined with synonyms that will map to reference values.

Dietary	Synonyms
vegetarian	vegetarian, veggies, veg, vegan, vegetables only, veggies only, vegg, herbivorous, gluten-free, plant-eating, veggie-lovers
halal	halal, no pork, no lard
eggetarian	Eggetarian, vegetarian
fruitarian	fruitarian, fruits, fruit
non-vegetarians	non-vegetarians, non-veg, non-vegetarian, meat-lovers

5.2 Cooking

5.2.1 Select cooking mode

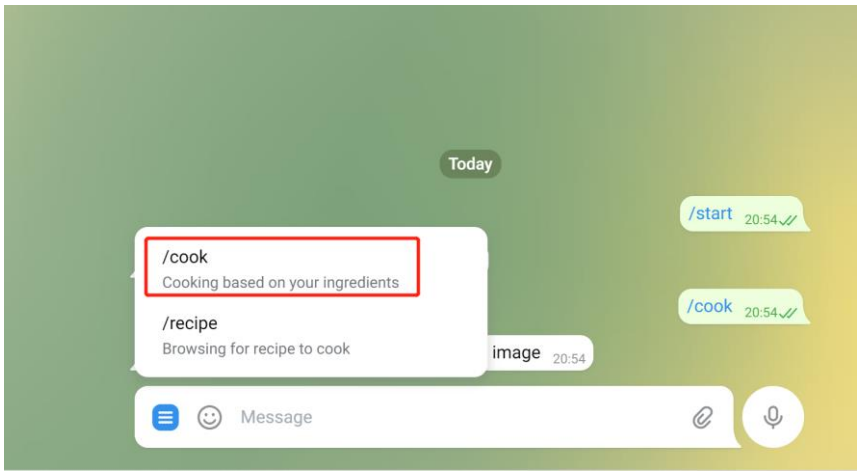


Figure 2 Cooking Mode

5.2.2 Type in the ingredients or upload an image

Figure 3 Type in Ingredients in Text Form

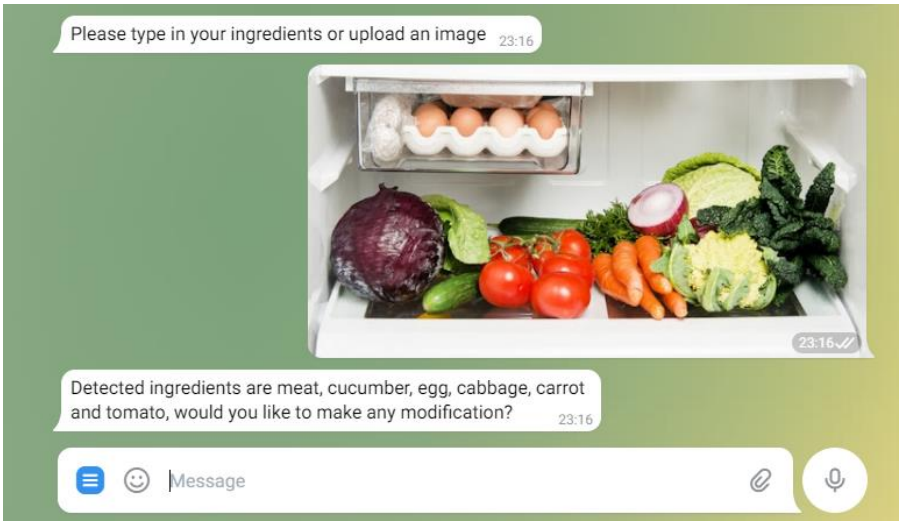


Figure 4 Upload Photo for Food Detection

5.2.3 Modify input ingredient

If you are not satisfied with the detected results, you can choose to modify them. Just enter “yes” and input them.

5.2.4 Input your preference

The robot will enquiry your dining preference for cuisine and dietary, if you do not have the preference, you can just tell it “No cuisine” or “No dietary”.

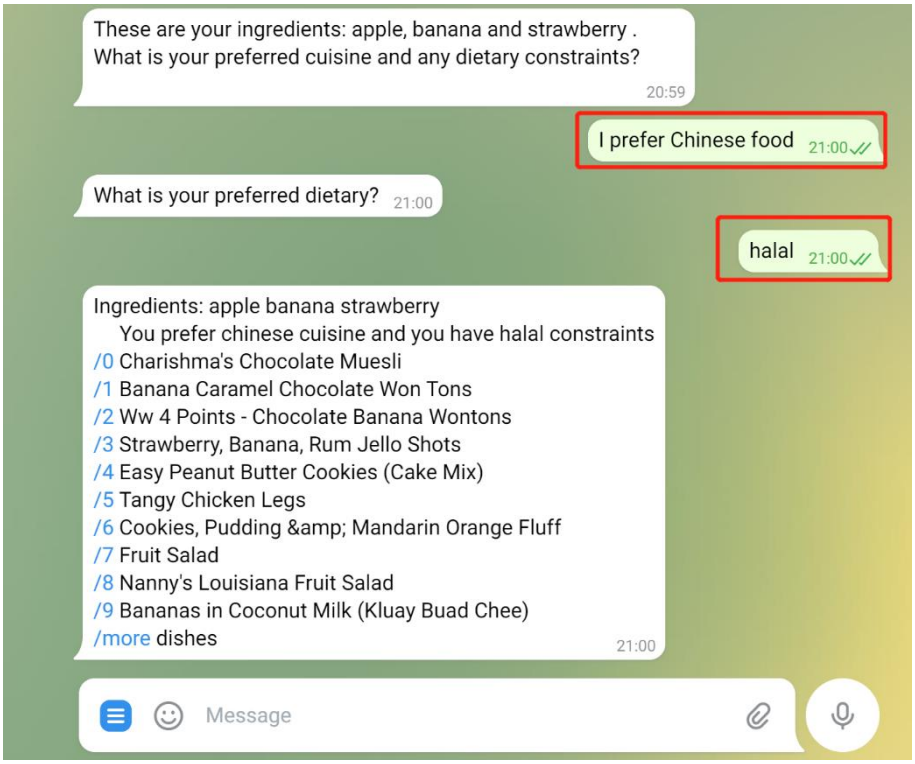


Figure 5 Input Preferences (Dietary and Cuisine)

5.2.5 Choosing your favourite dish!

By default, the robot will recommend you 10 dishes based on your ingredients and preferences. You can click the number in blue highlight to see details or click “/more” to look at more dishes.

Figure 6 Selection of Recipe

5.2.6 Check details for a dish

Figure 7 Details of Recipe

Figure 8 Recipe's Instructions

5.3 Browsing

If you just want to have a look at our recipes or grab some new ideas for cooking, browsing mode may satisfy your demand.

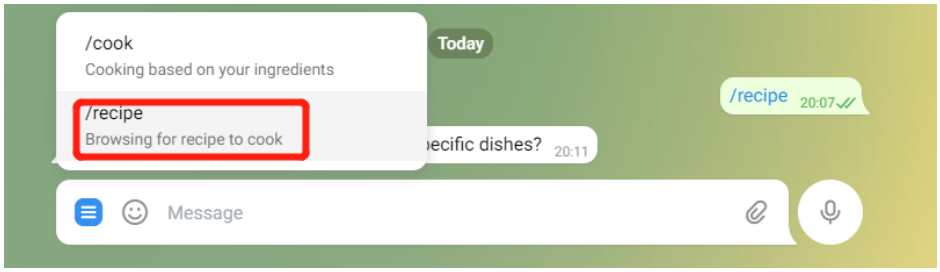


Figure 9 Browsing Mode

5.3.1 Random Dishes

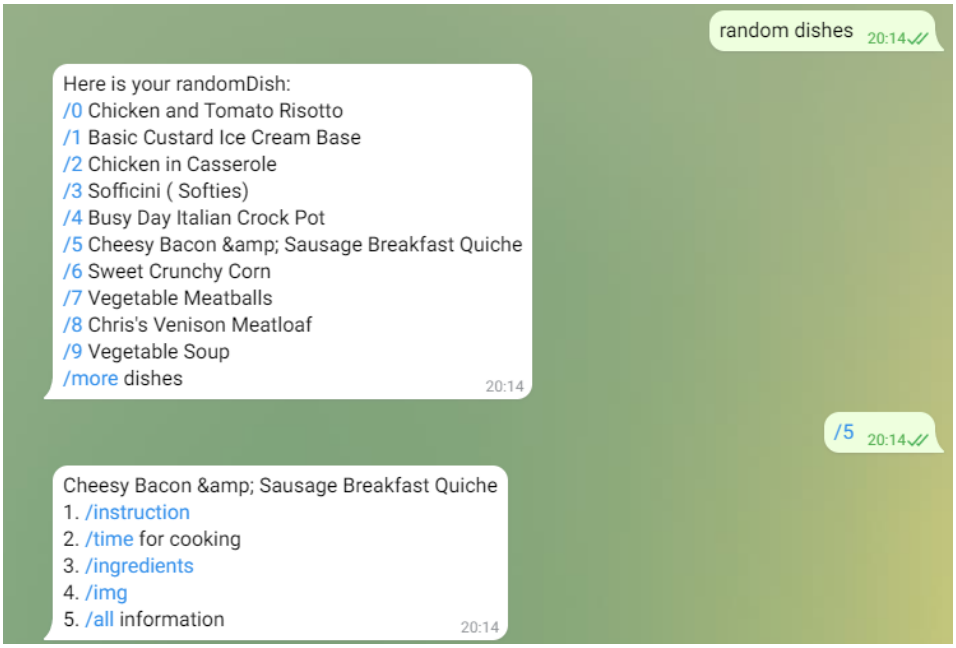


Figure 10 Random Recipe (Browsing Mode)

5.3.2 Specific Dishes

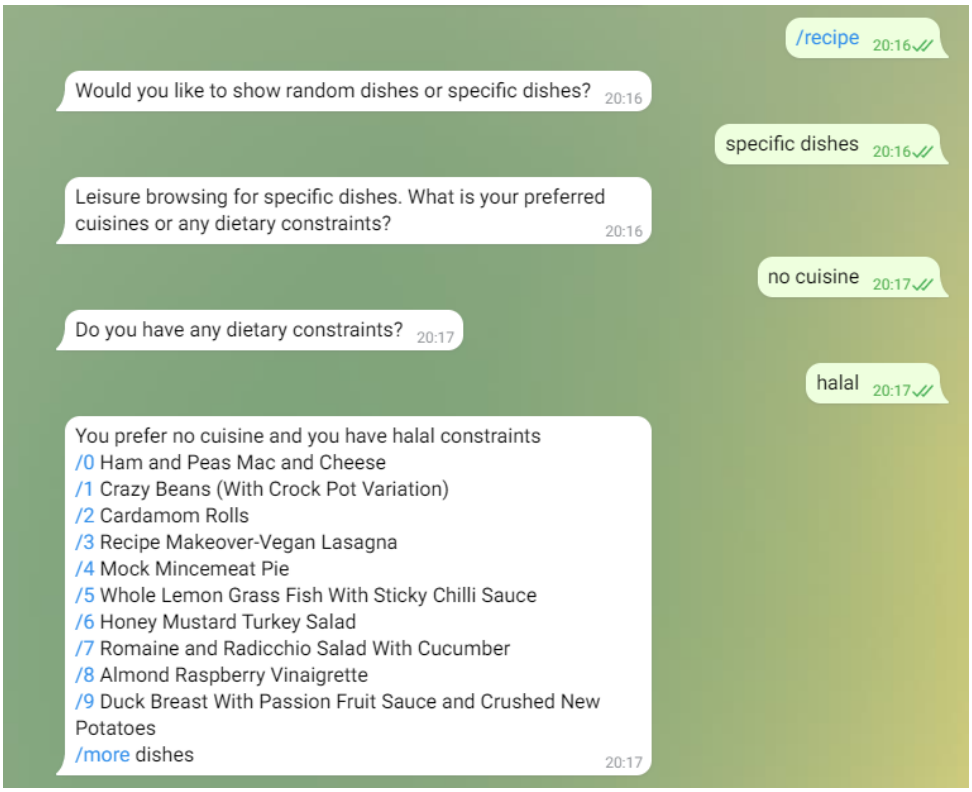


Figure 11 Specific Recipe (Browsing Mode)

For ISS Use Only		
Programme Name:	**Project No:**	**Learner Batch:**
Accepted/Rejected/KIV:		
Learners Assigned:		
Advisor Assigned: Contact: Mr. GU ZHAN / Lecturer & Consultant Telephone No.: 65-6516 8021 Email: zhan.gu@nus.edu.sg		