

A.I. Food Recommender

NUS-ISS Master of Technology (Intelligent System)



Installation & User Guide

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1. Installation and Deployment

1.1. System Requirements and Dependencies

- .Net Core SDK and ASP.NET Core runtime (Instructions provided in Section 1.3 below)
- Git (Download and Installation [here](#))
- Docker Desktop (Download and Installation [here](#)).
 - Another option for Windows OS is Docker Toolbox for Windows (Download and Installation [here](#)) to avoid conflict with VirtualBox
- A modern web browser. Recommended Google Chrome Version 81 and above

Note: A.I. Food Recommender has only been tested on the following systems:

- ISS-vm from <https://github.com/telescopeuser/iss-vm>
- Windows 10 version 1909, OS build 18363.815

1.2. Backend deployment

=====

1.2.1. Option 1: Use the pre-built Docker image hosted on Docker Hub

- Step 1 - Open the CMD/Terminal, make sure Docker is running

```
$ docker --version
Docker version 19.03.8, build afacb8b
```

- Step 2 - Download the container image from Dockerhub

```
$ docker pull ldkhang/foodrec_proj:develop-1.0
```

1.2.1. Option 2: Rebuilding the Docker image locally from source code

- Step 1 - Open the CMD/Terminal, and download the source code repo with git:

```
$ git clone
https://github.com/ISS-IS02PT/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.
-Food-Recommender.git

# Navigate to the following directory
$ cd IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender
$ cd SystemCode/Integrations
```

- **Step 2** - Build the image locally (this is a long running process)

```
# Make sure Docker is running
$ docker --version
Docker version 19.03.8, build afacb8b

# Execute the build command, note the trailing '.' is needed
$ docker build -f Dockerfile.develop -t
ldkhang/foodrec_proj:develop-1.0 .
```

=====

1.2.2. Start the Backend container

- **Step 1** - Create the Backend container, on port 8000

```
# Env variable 'DJANGO_SECRET_KEY' can be just any random string
$ docker run -d -p 8000:8001 -e DJANGO_SECRET_KEY=_someSecr3tKey123
ldkhang/foodrec_proj:develop-1.0
```

- **Step 2** - Verify that the container is up, and take note of the container ID

```
$ docker ps -a
```

CONTAINER ID	IMAGE	COMMAND
CREATED	STATUS	PORTS
NAMES		
8f6fd1669900	ldkhang/foodrec_proj:develop-1.0	
"/usr/bin/supervisord"	4 minutes ago	Up 4 minutes
0.0.0.0:8000->8001/tcp	unruffled_aryabhata	

1.3. Frontend deployment

1.3.1. Install Microsoft .NET Core

Option 1 - Linux environment

- Step 1 - From the terminal, register Microsoft key and feed

```
$ wget
https://packages.microsoft.com/config/ubuntu/19.10/packages-microsoft
-prod.deb -O packages-microsoft-prod.deb

$ sudo dpkg -i packages-microsoft-prod.deb
```

- Step 2 - Install .NET Core SDK

```
$ sudo apt-get update

$ sudo apt-get install apt-transport-https

$ sudo apt-get update

$ sudo apt-get install dotnet-sdk-3.1
```

- Step 3 - Install ASP.NET Core runtime

```
$ sudo apt-get update

$ sudo apt-get install apt-transport-https

$ sudo apt-get update
```

```
$ sudo apt-get install aspnetcore-runtime-3.1
```

Option 2 - Windows environment

- Step 1 - Download and install .NET Core SDK from <https://dotnet.microsoft.com/download/dotnet-core/3.1>
- Step 2 - Download and install ASP.NET Core runtime from <https://dotnet.microsoft.com/download/dotnet-core/3.1>

1.3.2. Run Web Client

Option 1 - Linux environment

- Step 1 - From the downloaded local Github repo, navigate to this location

```
# Clone the repo if you haven't done it in Section 1.2 - Option 2
$ git clone
https://github.com/ISS-IS02PT/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-
Recommender.git

$ cd
IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Int
egrations/FoodApiClient
```

- Step 2 - Run the following bash script to start the application

```
$ bash runLinux.sh
```

Option 2 - Windows environment

- Step 1 - From the downloaded local Github repo, navigate to this location

```
# Clone the repo if you haven't done it in Section 1.2 - Option 2
```

```
$ git clone
https://github.com/ISS-IS02PT/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender.git

$ cd
\IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender\SystemCode\Integrations\FoodApiClient
```

- Step 2 - Run the following bash script to start the application from Git Bash (installed as part of Git)

```
# If you are installing Docker Desktop
$ runWin.sh

# If you are installing Docker Toolbox for Windows
$ runWinToolbox.sh
```

Wait for the web client to start (and make sure the backend container is still running from Section 1.2). If the browser doesn't pop up automatically, we can access the application from the browser by visiting <http://localhost:5001>

2. User Experience

2.1. Calculate recommended nutrients

1. On the web interface, enter the user profile information:
 - a. **Age** (years), **Height** (centimeters) and **Weight** (kg)
 - b. **Gender** [Male / Female]
 - c. **Activity** - how physically active?
 - i. Sedentary - little or no exercise
 - ii. Lightly active - exercise about 1-2 times per week
 - iii. Moderately active - exercise about 4-5 times per week
 - iv. Very active - exercise daily
 - d. **Diet type**
 - i. Standard
 - ii. Ketogenic

[Food API Client](#) [Home](#) [Privacy](#)

Food Recommendation and Nutrients Calculation

User Profile

Age (years)

Height (cm)

Weight (kg)

Gender

Activity

Diet

Calculate Nutrients

2. Click [Calculate Nutrients](#) to get a set of recommended nutrients based on user profile.

Food API Client Home Privacy

Food Recommendation and Nutrients Calculation

User Profile	Nutrients	Food Options
Age (years) <input type="text" value="76"/>	Energy (kcal) <input type="text" value="1218.3"/>	<input type="checkbox"/> Vegan
Height (cm) <input type="text" value="161"/>	Carbohydrates (g) <input type="text" value="15.23"/>	<input type="checkbox"/> Vegetarian
Weight (kg) <input type="text" value="55"/>	Proteins (g) <input type="text" value="60.91"/>	<input type="checkbox"/> Halal
Gender <input type="text" value="Female"/>	Total Fats (g) <input type="text" value="101.52"/>	
Activity <input type="text" value="Sedentary"/>	<input type="button" value="Get Food Recommendation"/>	
Diet <input type="text" value="Ketogenic"/>		
<input type="button" value="Calculate Nutrients"/>		

2.2. Get food recommendation

1. The recommended nutrients amounts are calculated automatically by the application based on the user profile input, but these values can also be changed manually to better fit the user. Just key in the new values to the textbox if desired:
 - a. **Energy** in kcal or kilocalorie
 - b. **Carbohydrates** in grams
 - c. **Proteins** in grams
 - d. **Fats** in grams
2. The **Diet** type can also be changed for the food recommendation.
3. There are 3 food restriction options for filtering the food recommendations
 - a. **Vegan** - no animal products or by-products, e.g. non-dairy and no eggs.
 - b. **Vegetarian** - no meat
 - c. **Halal** - food that are Halal certified for muslim consumption and no pork

- Click [Get Food Recommendation](#) to get a list of food based on the nutrients requirements.

[Food API Client](#) [Home](#) [Privacy](#)

Food Recommendation and Nutrients Calculation

User Profile

Age (years)

Height (cm)

Weight (kg)

Gender

Activity

Diet

[Calculate Nutrients](#)

Nutrients

Energy (kcal)

Carbohydrates (g)

Proteins (g)

Total Fats (g)

[Get Food Recommendation](#)

Food Options

☐ Vegan

☐ Vegetarian

☒ Halal

Keep	Index	Name	Group	Energy (kcal)	Carbohydrates (g)	Proteins (g)	Total Fats (g)	Vegan	Vegetarian	Halal	Contains Beef	Contains Alcohol	Meal Type
<input type="checkbox"/>	2379	Denver omelet	BREAKFAST FOODS	390	7.1	23.9	29.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BREAKFAST
<input type="checkbox"/>	1417	Omelette with prawn and green onion	MIXED ETHNIC DISHES, ANALYZED IN SINGAPORE	637.66	0.27	24.22	59.97	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LUNCH
<input type="checkbox"/>	476	Chicken, drumstick, hot and crispy, KFC	FAST FOODS	212.42	7.5	17.2	16.2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DINNER
Total Nutrients				1240.08	14.87	65.32	105.27						
Nutrients vs Energy Ratio					4.8%	21.07%	76.4%						

[Refresh](#)

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- Click [Refresh](#) to get another food recommendation.
- Alternatively, by checking the box on the **Keep** column for selected food items before clicking the [Refresh](#) button, the application will just refresh and change the rest of the unchecked food items.

55

60.91

Gender

Female

Total Fats (g)

101.52

Activity

Sedentary

Get Food Recommendation

Diet

Ketogenic

Calculate Nutrients

Keep	Index	Name	Group	Energy (kcal)	Carbohydrates (g)	Proteins (g)	Total Fats (g)	Vegan	Vegetarian	Halal	Contains Beef	Contains Alcohol	Meal Type
<input checked="" type="checkbox"/>	2379	Denver omelet	BREAKFAST FOODS	390	7.1	23.9	29.1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	BREAKFAST
<input type="checkbox"/>	131	Beef serunding (Malay)	MIXED ETHNIC DISHES, ANALYZED IN SINGAPORE	729.33	8.09	33.64	62.49	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	LUNCH
<input type="checkbox"/>	2161	Tuna sandwich type, canned in oil	FISH AND FISH PRODUCTS	101.05	0	7.24	8.08	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	DINNER
Total Nutrients				1220.38	15.19	64.78	99.67						
Nutrients vs Energy Ratio				4.98%		21.23%	73.5%						

Refresh

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- If the application is unable to find any food to fit the nutrients requirements (most likely due to lack of database), an error message will be displayed.

Food Recommendation and Nutrients Calculation

User Profile

Age (years)

76

Height (cm)

161

Weight (kg)

55

Gender

Female

Activity

Sedentary

Diet

Ketogenic

[Calculate Nutrients](#)

Nutrients

Energy (kcal)

1218.3

Carbohydrates (g)

15.23

Proteins (g)

60.91

Total Fats (g)

101.52

[Get Food Recommendation](#)

Insufficient food data to fulfill the nutrients requirement now, please come back later.

Food Options

☒ Vegan☐ Vegetarian☐ Halal

Keep	Index	Name	Group	Energy (kcal)	Carbohydrates (g)	Proteins (g)	Total Fats (g)	Vegan	Vegetarian	Halal	Contains Beef	Contains Alcohol	Meal Type
------	-------	------	-------	---------------	-------------------	--------------	----------------	-------	------------	-------	---------------	------------------	-----------

[Refresh](#)

Food Recommendation and Nutrients Calculation

User Profile

Age (years)

76

Height (cm)

161

Weight (kg)

55

Gender

Female

Activity

Sedentary

Diet

Ketogenic

[Calculate Nutrients](#)

Nutrients

Energy (kcal)

1218.3

Carbohydrates (g)

15.23

Proteins (g)

60.91

Total Fats (g)

101.52

[Get Food Recommendation](#)

Food Options

☐ Vegan☐ Vegetarian☒ Halal

Keep	Index	Name	Group	Energy (kcal)	Carbohydrates (g)	Proteins (g)	Total Fats (g)	Vegan	Vegetarian	Halal	Contains Beef	Contains Alcohol	Meal Type
------	-------	------	-------	---------------	-------------------	--------------	----------------	-------	------------	-------	---------------	------------------	-----------

[Refresh](#)

Insufficient food data to fulfill the nutrients requirement now, please come back later.

3. Uninstallation

- Step 1 - To uninstall the Backend, delete and clean up the container using the corresponding container ID captured in step 1.2

```
# Delete the container
$ docker rm -vf 8f6fd1669900

# Delete the image
$ docker rmi ldkhang/foodrec_proj:develop-1.0
```

- Step 2 - To close and stop the frontend web client,
 - Close the browser that is running the web page
 - Press Ctrl+C at the terminal that is running the web app server to shut down the server.

■ Linux environment

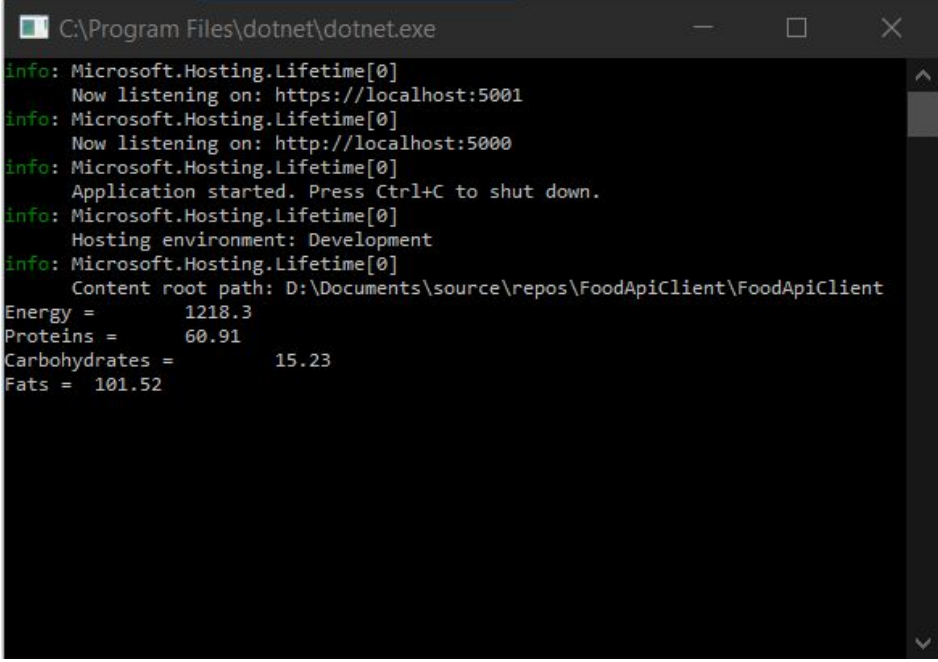
```
(base) lss-user@lss-vm:~/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Integrations/FoodApiClient$ bash runLinux.sh
Microsoft (R) Build Engine version 16.5.0+d4cbfca49 for .NET Core
Copyright (C) Microsoft Corporation. All rights reserved.

Restore completed in 271.6 ms for /home/lss-user/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Integrations/FoodApiClient/FoodApiClient/FoodApiClient.t.csproj.
FoodApiClient -> /home/lss-user/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Integrations/FoodApiClient/FoodApiClient/bin/Debug/netcoreapp3.1/FoodApiClient.dll
FoodApiClient -> /home/lss-user/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Integrations/FoodApiClient/FoodApiClient/bin/Debug/netcoreapp3.1/FoodApiClient.Views.dll

Build succeeded.
    0 Warning(s)
    0 Error(s)

Time Elapsed 00:00:15.79
[10278:10278:0510/123312.412688:ERROR:gpu_process_transport_factory.cc(1009)] Lost UI shared context.
[1:10:0510/123313.008347:ERROR:command_buffer_proxy_impl.cc(115)] ContextResult::kFatalFailure: Shared memory handle is not valid
[10278:10278:0510/123314.068398:ERROR:navigation_entry_screenshot_manager.cc(135)] Invalid entry with unique id: 1
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: https://localhost:5001
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: http://localhost:5000
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: /home/lss-user/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Integrations/FoodApiClient/FoodApiClient
[10278:10393:0510/123319.416146:ERROR:cert_verify_proc_nss.cc(922)] CERT_PKIXVerifyCert for localhost failed err=-8179
^Cinfo: Microsoft.Hosting.Lifetime[0]
      Application is shutting down...
(base) lss-user@lss-vm:~/IRS-PM-ISY5001-2020-01-18-GROUP5-A.I.-Food-Recommender/SystemCode/Integrations/FoodApiClient$
```

-
- Windows environment - the window title of the terminal is "C:\Program Files\dotnet\dotnet.exe" (which is the file location of the "dotnet.exe")



```
C:\Program Files\dotnet\dotnet.exe
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: https://localhost:5001
info: Microsoft.Hosting.Lifetime[0]
      Now listening on: http://localhost:5000
info: Microsoft.Hosting.Lifetime[0]
      Application started. Press Ctrl+C to shut down.
info: Microsoft.Hosting.Lifetime[0]
      Hosting environment: Development
info: Microsoft.Hosting.Lifetime[0]
      Content root path: D:\Documents\source\repos\FoodApiClient\FoodApiClient
Energy =      1218.3
Proteins =      60.91
Carbohydrates =      15.23
Fats = 101.52
```