ASSIGNMENT 2

DPIT 121 Object Oriented Design And Programming

DECEMBER 20, 2024

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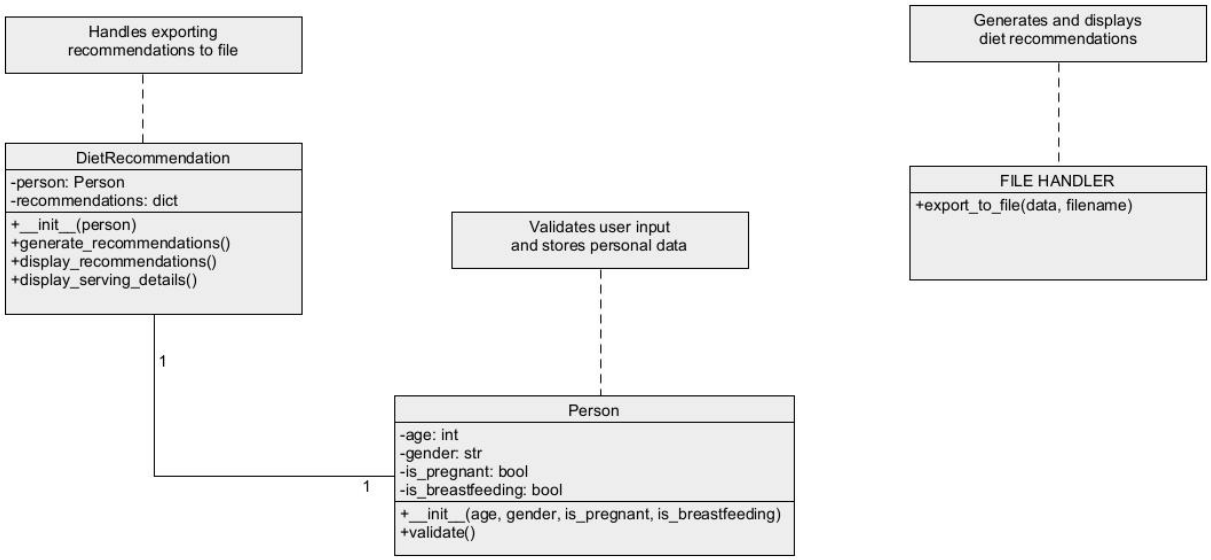
Contents

UML Diagrams



Program Description

This Python program is designed as a **Dietary Recommendation System** that provides tailored dietary guidelines based on user-specific attributes such as age, gender, pregnancy, and breastfeeding status. Its key features include:

User Input and Validation:

- Collects user data (age, gender, and special conditions like pregnancy or breastfeeding).
- Validates the inputs to ensure accuracy and handle exceptional cases.

Dietary Recommendations:

- Generates personalized daily recommendations for the five main food groups: vegetables, fruits, grains, meats, and dairy.

- Incorporates detailed single-serving examples for each food group.

Export Capability:

- Allows users to export their recommendations to a text file for future reference.

Error Handling:

- Handles invalid inputs gracefully with descriptive error messages.

Object-Oriented Design:

- The program uses OOP principles for modularity and scalability:
  - Person class handles user-specific data and validation.
  - DietRecommendation class calculates and displays personalized dietary suggestions.
  - FileHandler class manages file export operations.
- This structure makes the program easy to extend for additional functionalities.

Static Methods:

- Serving details and file export functionalities are implemented as static methods to emphasize their independence from instance attributes.

Extensibility:

- The DietRecommendation class includes multiple conditions based on age groups, making it adaptable for future updates or new dietary rules.

Input Validation:

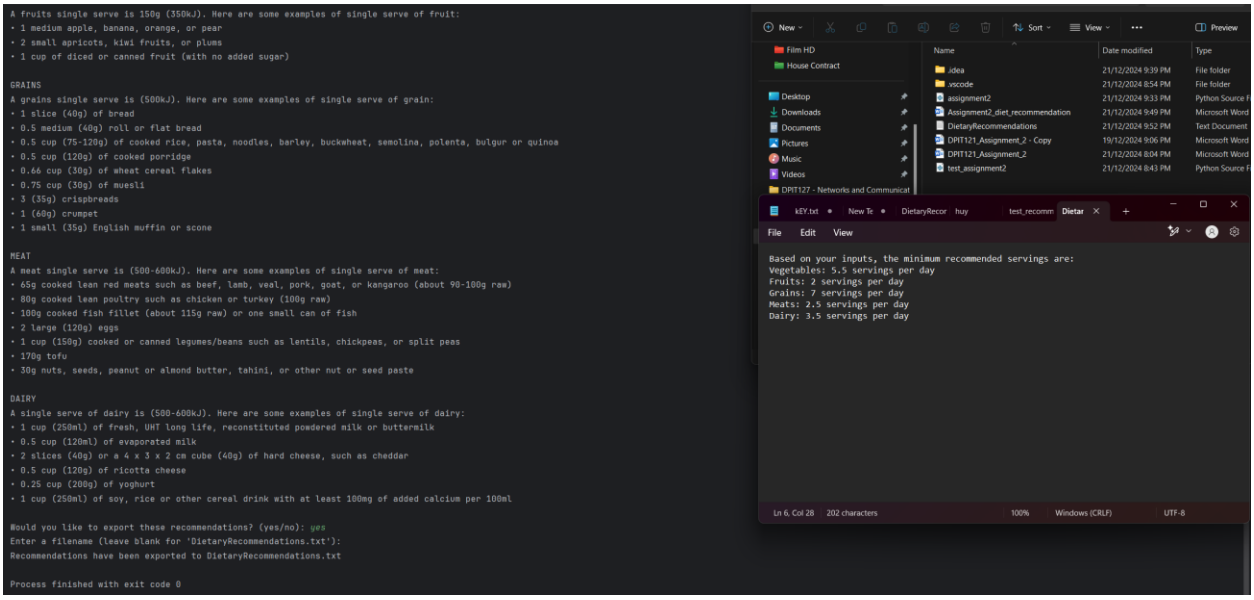
- Age must be between 1 and 120.
- Gender must be either "male" or "female."
- Pregnancy and breastfeeding conditions are invalid for minors (<18 years).

Graceful Error Recovery:

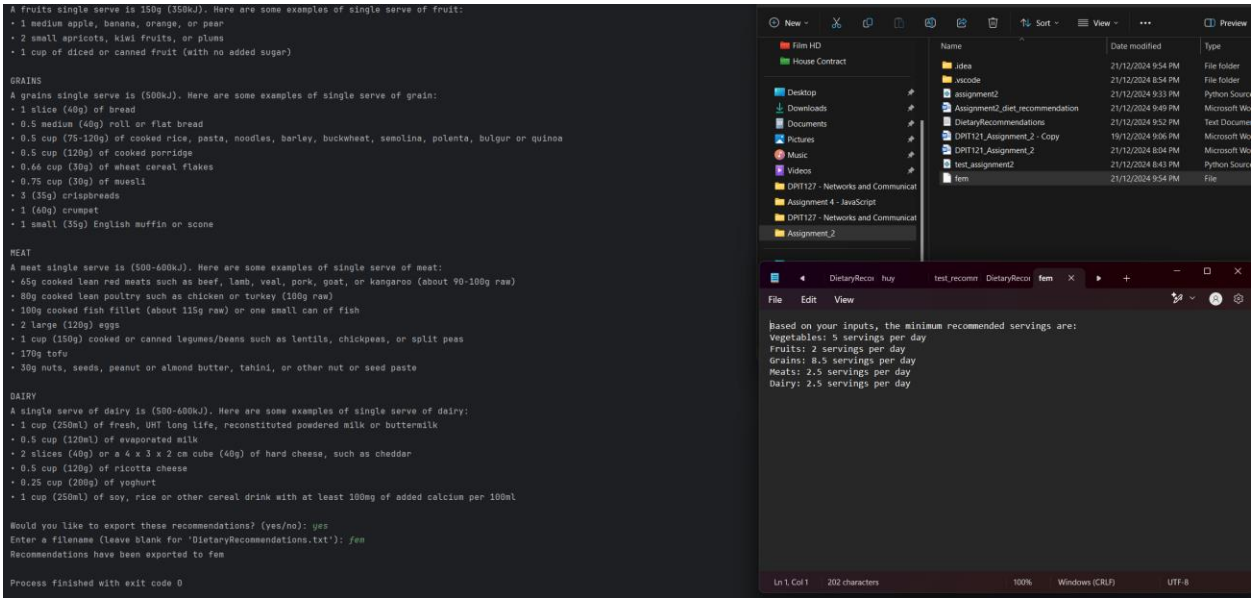
- try-except blocks catch invalid inputs and unexpected exceptions to prevent crashes.
- User-friendly messages guide users to correct their inputs.

User Output Screenshot

Male 18 Years Old – Export file Named by default:



Female 20 – pregnant – Export File Named “fem” :



Female 8 years old:

```
C:\Users\Admin\AppData\Local\Programs\Python\Python311\python.exe "D:\My Study File\DPIT121 - Python OOP\Assignment_2\assignment2.py"
Enter your age: 8
Enter your gender (male/female): female
Based on your inputs, the minimum recommended servings are:
Vegetables: 5 servings per day
Fruits: 2 servings per day
Grains: 4 servings per day
Meats: 2 servings per day
Dairy: 4 servings per day

Additionally, each food category single serving recommendations are detailed as shown as follows:

VEGETABLES
A vegetables single serve is 75g (100-350kJ). Here are some examples of single serve of Vegetable:
• 0.5 cup of cooked green or orange vegetables (like broccoli, spinach, carrots, or pumpkin)
• 0.5 cup of cooked dried or canned beans, peas, or lentils
• 1 cup of green leafy or raw salad vegetables
• 0.5 cup of sweet corn
• 0.5 of a medium potato or other starchy vegetables (such as sweet potato, taro, or cassava)
• 1 medium tomato

FRUITS
A fruits single serve is 150g (350kJ). Here are some examples of single serve of fruit:
• 1 medium apple, banana, orange, or pear
• 2 small apricots, kiwi fruits, or plums
• 1 cup of diced or canned fruit (with no added sugar)

GRAINS
A grains single serve is (500kJ). Here are some examples of single serve of grain:
• 1 slice (40g) of bread
• 0.5 medium (40g) roll or flat bread
• 0.5 cup (75-120g) of cooked rice, pasta, noodles, barley, buckwheat, semolina, polenta, bulgur or quinoa
• 0.5 cup (120g) of cooked porridge
• 0.66 cup (30g) of wheat cereal flakes
• 0.75 cup (30g) of muesli
• 3 (35g) crispbreads
• 1 (60g) crumpet
• 1 small (35g) English muffin or scone

MEAT
A meat single serve is (500-600kJ). Here are some examples of single serve of meat:
• 65g cooked lean red meats such as beef, lamb, veal, pork, goat, or kangaroo (about 90-100g raw)
```

```
|
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• 65g cooked lean red meats such as beef, lamb, veal, pork, goat, or kangaroo (about 90-100g raw)
• 80g cooked lean poultry such as chicken or turkey (100g raw)
• 100g cooked fish fillet (about 115g raw) or one small can of fish
• 2 large (120g) eggs
• 1 cup (150g) cooked or canned legumes/beans such as lentils, chickpeas, or split peas
• 170g tofu
• 30g nuts, seeds, peanut or almond butter, tahini, or other nut or seed paste

DAIRY
A single serve of dairy is (500-600kJ). Here are some examples of single serve of dairy:
• 1 cup (250ml) of fresh, UHT long life, reconstituted powdered milk or buttermilk
• 0.5 cup (120ml) of evaporated milk
• 2 slices (40g) or a 4 x 3 x 2 cm cube (40g) of hard cheese, such as cheddar
• 0.5 cup (120g) of ricotta cheese
• 0.25 cup (200g) of yoghurt
• 1 cup (250ml) of soy, rice or other cereal drink with at least 100mg of added calcium per 100ml

#ould you like to export these recommendations? (yes/no): no

Process finished with exit code 0
```

Unit Test Screen Shot

Terminal Report

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS D:\My Study File\DPIT121 - Python OOP\Assignment_2> coverage run -m unittest discover
Enter your age: 12
Enter your gender (male/female): male
Based on your inputs, the minimum recommended servings are:
Vegetables: 5.5 servings per day
Fruits: 2 servings per day
Grains: 6 servings per day
Meats: 2.5 servings per day
Dairy: 3.5 servings per day

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• 0.5 cup (120g) of ricotta cheese
• 0.25 cup (200g) of yoghurt
• 1 cup (250ml) of soy, rice or other cereal drink with at least 100mg of added calcium per 100ml

Would you like to export these recommendations? (yes/no): yes
Enter a filename (leave blank for 'DietaryRecommendations.txt'): mhuy
Recommendations have been exported to mhuy
...Recommendations have been exported to test_diet_recommendations.txt
.....
----------------------------------------------------------------------
Ran 8 tests in 0.003s

OK
PS D:\My Study File\DPIT121 - Python OOP\Assignment_2> coverage report
Name                Stmts   Miss  Cover
---------------------------------------
assignment2.py         97     19    80%
test_assignment2.py   108      1    99%
---------------------------------------
TOTAL                 205     20    90%
PS D:\My Study File\DPIT121 - Python OOP\Assignment_2> coverage html
Wrote HTML report to htmlcov\index.html
```
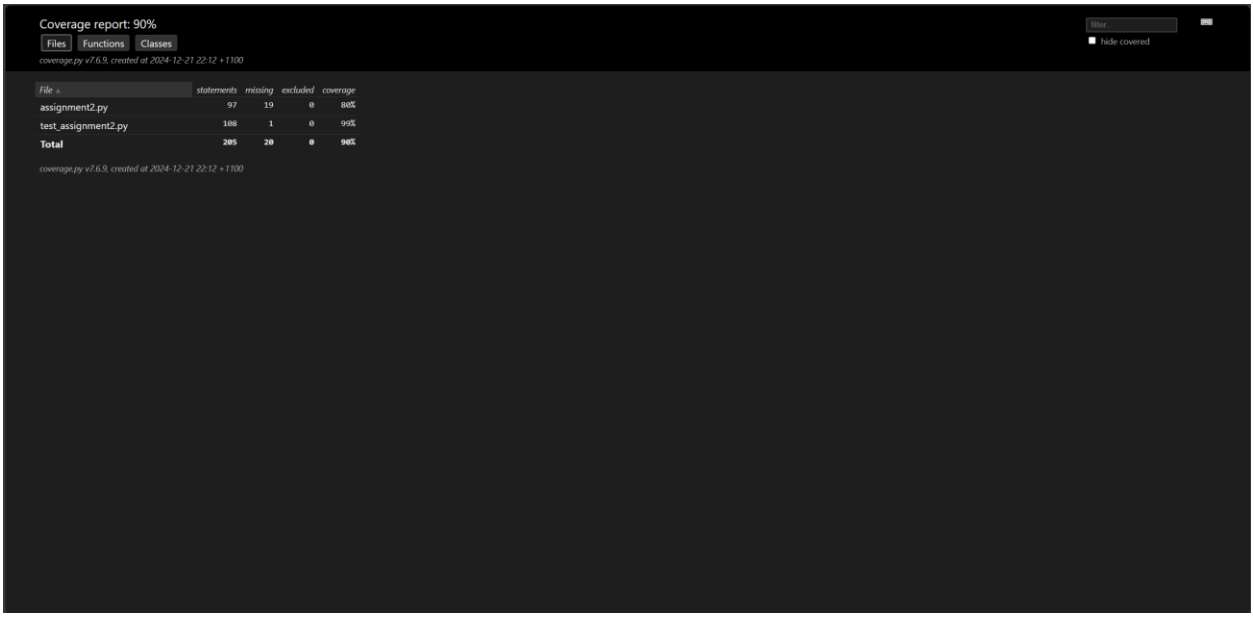
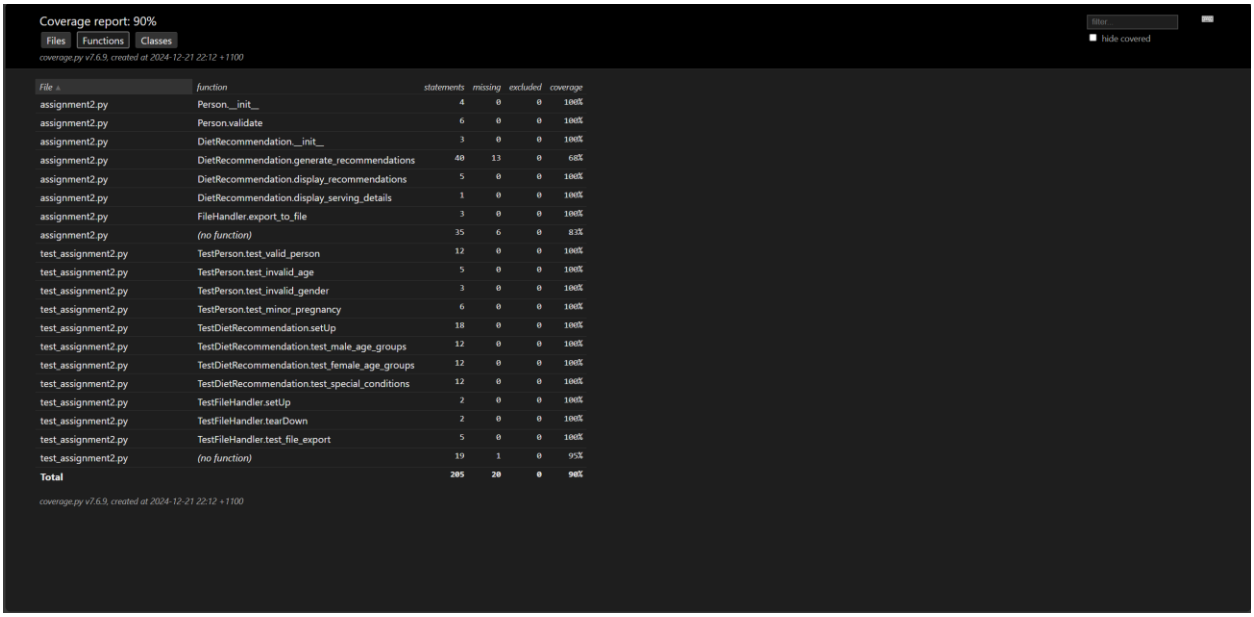
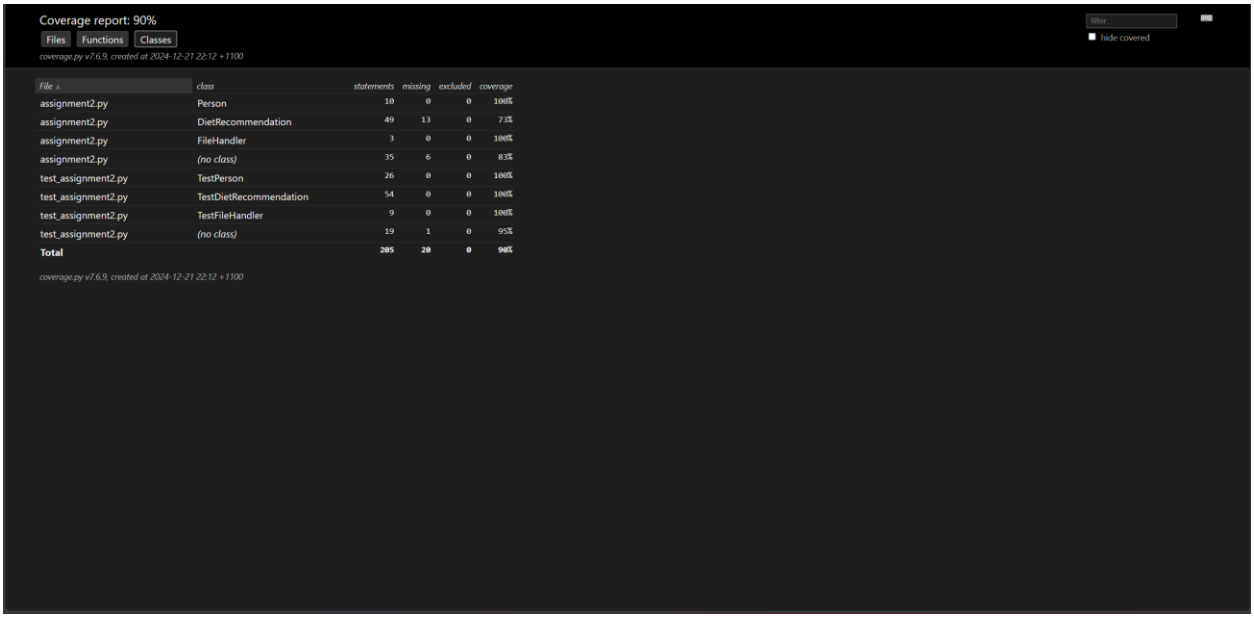

HTML Report


Coverage report: 90%
Files
Functions
Classes
coverage.py v7.6.9, created at 2024-12-21 22:12 +1100
filter...
hide covered
File
statements
missing
excluded
coverage
assignment2.py 97 19 0 80%
test_assignment2.py 108 1 0 99%
Total 205 20 0 90%
coverage.py v7.6.9, created at 2024-12-21 22:12 +1100


Coverage report: 90%
Files
Functions
Classes
coverage.py v7.6.9, created at 2024-12-21 22:12 +1100
filter...
hide covered
File
function
statements
missing
excluded
coverage
assignment2.py Person.__init__ 4 0 0 100%
assignment2.py Person.validate 6 0 0 100%
assignment2.py DietRecommendation.__init__ 3 0 0 100%
assignment2.py DietRecommendation.generate_recommendations 40 13 0 68%
assignment2.py DietRecommendation.display_recommendations 5 0 0 100%
assignment2.py DietRecommendation.display_serving_details 1 0 0 100%
assignment2.py FileHandler.export_to_file 3 0 0 100%
assignment2.py (no function) 35 6 0 83%
test_assignment2.py TestPerson.test_valid_person 12 0 0 100%
test_assignment2.py TestPerson.test_invalid_age 5 0 0 100%
test_assignment2.py TestPerson.test_invalid_gender 3 0 0 100%
test_assignment2.py TestPerson.test_minor_pregnancy 6 0 0 100%
test_assignment2.py TestDietRecommendation.setUp 18 0 0 100%
test_assignment2.py TestDietRecommendation.test_male_age_groups 12 0 0 100%
test_assignment2.py TestDietRecommendation.test_female_age_groups 12 0 0 100%
test_assignment2.py TestDietRecommendation.test_special_conditions 12 0 0 100%
test_assignment2.py TestFileHandler.setUp 2 0 0 100%
test_assignment2.py TestFileHandler.tearDown 2 0 0 100%
test_assignment2.py TestFileHandler.test_file_export 5 0 0 100%
test_assignment2.py (no function) 19 1 0 95%
Total 205 20 0 90%
coverage.py v7.6.9, created at 2024-12-21 22:12 +1100



Coverage report: 90%

Files Functions Classes

coverage.py v7.6.9, created at 2024-12-21 22:12 +1100

filter

hide covered

File	class	statements	missing	excluded	coverage
assignment2.py	Person	10	0	0	100%
assignment2.py	DietRecommendation	49	13	0	73%
assignment2.py	FileHandler	3	0	0	100%
assignment2.py	*(no class)*	35	6	0	83%
test_assignment2.py	TestPerson	26	0	0	100%
test_assignment2.py	TestDietRecommendation	54	0	0	100%
test_assignment2.py	TestFileHandler	9	0	0	100%
test_assignment2.py	*(no class)*	19	1	0	95%
Total		**205**	**20**	**0**	**90%**

coverage.py v7.6.9, created at 2024-12-21 22:12 +1100