

FitMyWeight

CSE 252: Application Development Sessional

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Introduction

FitMyWeight is an application that helps its users to determine their physical weight status is that underweight, normal weight or overweight. It suggests a daily food plan that helps them attain healthy weight. Users can get desired food plans as their preferences to lose or gain weight in terms of weeks. FitMyWeight calculates Body Mass Index (BMI) using height and weight information of the user. Weight status is determined using BMI. Basal Metabolic Rate (BMR) is used to calculate how much calories per day is required for maintaining current weight, weight losing and weight gaining.

Objectives

- To calculate Body Mass Index (BMI).
- To measure daily calorie intake recommendation.
- To provide a healthy and befitting daily food plan based on the user's determination of weightlosing or gaining.

General Objectives

Portraying a brief state of the user's physical weight and providing a daily food plan to attain user preferable weight. Which help users to achieve or maintain healthy weight, gain or lose weight as their preference of amount of gaining and/or losing weight.

Specific Objectives

- Calculates Body Mass Index (BMI) using user's height and weight information.
- Chooses a daily food plan using physical activity per week and Basal Metabolic Rate (BMR).
- Recommends daily food plan for maintaining current weight, user preferable weight losing and weight gaining.
- Underweight user's only get to choose current weight maintenance and weight gaining food plans.
- Overweight user's only get to choose current weight maintenance and weight losing food plans.
- Healthy weight user's get to choose current weight maintenance, weight losing and weight gaining food plans.

Motivation

Weight is responsible for many health problems. Healthy weight is important to be physically fit, strong and healthy. Underweight; especially overweight and obesity is one of the vital health problems in the current world.

World Health Organization (WHO) reported key facts about overweight and obesity ^[1]:

- In 2016, more than 1.9 billion adults aged 18 years and older were overweight. Of these over 650 million adults were obese.
- In 2016, 39% of adults aged 18 years and over (39% of men and 40% of women) were overweight.
- Overall, about 13% of the world's adult population (11% of men and 15% of women) were obese in 2016.
- The worldwide prevalence of obesity nearly tripled between 1975 and 2016. ● Obesity is preventable.

Common health consequences of overweight and obesity ^[1]:

- Cardiovascular diseases (mainly heart disease and stroke), which were the leading cause of death in 2012; ● diabetes;
- Musculoskeletal disorders (especially osteoarthritis – a highly disabling degenerative disease of the joints);

- Some cancers (including endometrial, breast, ovarian, prostate, liver, gallbladder, kidney, and colon).

World Health Organization (WHO) reported key facts about underweight or malnutrition ^[2]:

- Around 45% of deaths among children under 5 years of age are linked to undernutrition

- 1.9 billion adults are overweight or obese, while 462 million are underweight.

Advantages

User ages from 2 years to indefinite may be benefited using FitMyWeight. Since, FitMyWeight helps a person to maintain healthy and preferable weight. That may reduce underweight, overweight or obesity problems and helps to maintain healthy weight.

Technical Description

FitMyWeight takes age, gender, weight, height and physical activity as input. User's weight status i.e. if underweight, normal or overweight is determined by BMI using the user's height and weight information. It calculates required daily calories for maintaining current weight with the help of BMR and weekly physical activity. BMR is calculated by Mifflin - St Jeor formula (established in 1990, superseding the 1919 Harris-Benedict formula) using age, gender, height and weight.

Technical Functionalities

- $BMI = (\text{weight in kg}) / (\text{height in meter})^2$
- $BMR \text{ (for men)} = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) + 5$
- $BMR \text{ (for women)} = (10 \times \text{weight in kg}) + (6.25 \times \text{height in cm}) - (5 \times \text{age in years}) - 161$
- Daily Calorie Intake:
 - o Sedentary (little or no exercise) $\text{Calories Per Day} = BMR \times 1.2$
 - o Lightly active (light exercise or sports 1-3 days/week) $\text{Calories Per Day} = BMR \times 1.375$
 - o Moderately active (moderate exercise 3-5 days/week) $\text{Calories Per Day} = BMR \times 1.55$
 - o Very active (hard exercise 6-7 days/week) $\text{Calories Per Day} = BMR \times 1.72$
- Food plan based on calories needed is picked up from 26 food plans for different ages by United States Department of Agriculture (USDA)^[3]
- Daily calories needed for losing L(in kilogram) weight per week = $(\text{Maintenance calories}) - (500 * L / 0.453592)$
- Daily calories needed for gaining G(in kilogram) weight per week = $(\text{Maintenance calories}) + (500 * G / 0.453592)$
- ★ 1-pound (0.453592 kg) weight(loss/gain) requires approximately 3500 calories per week.

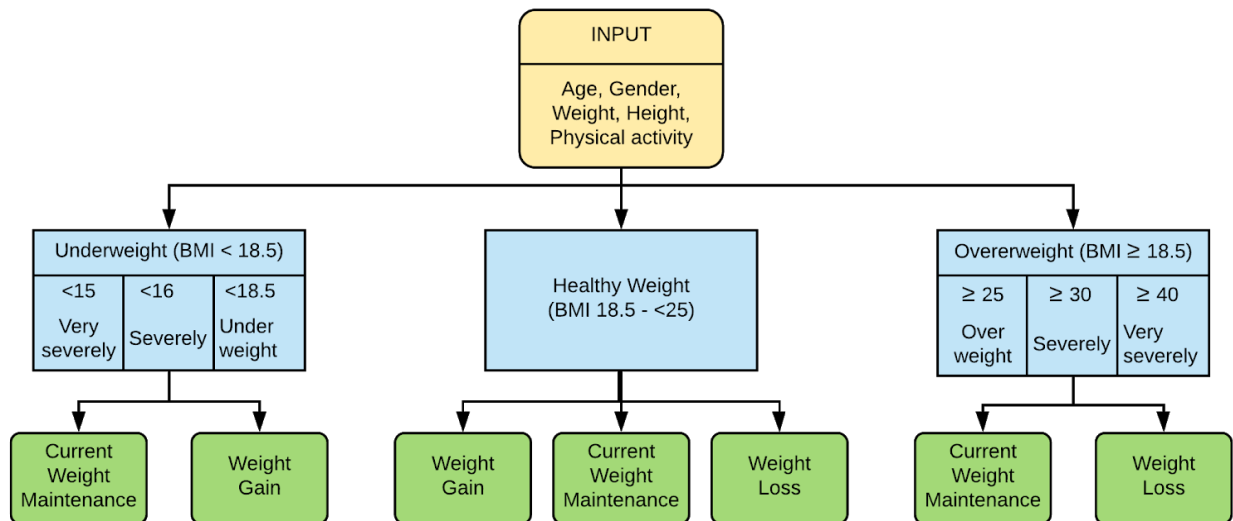
Technical Tools Used

- Netbeans 11.1
- Swing components: Frame, Label, Button, Radio Button, Text Field, Text Area
- Text files

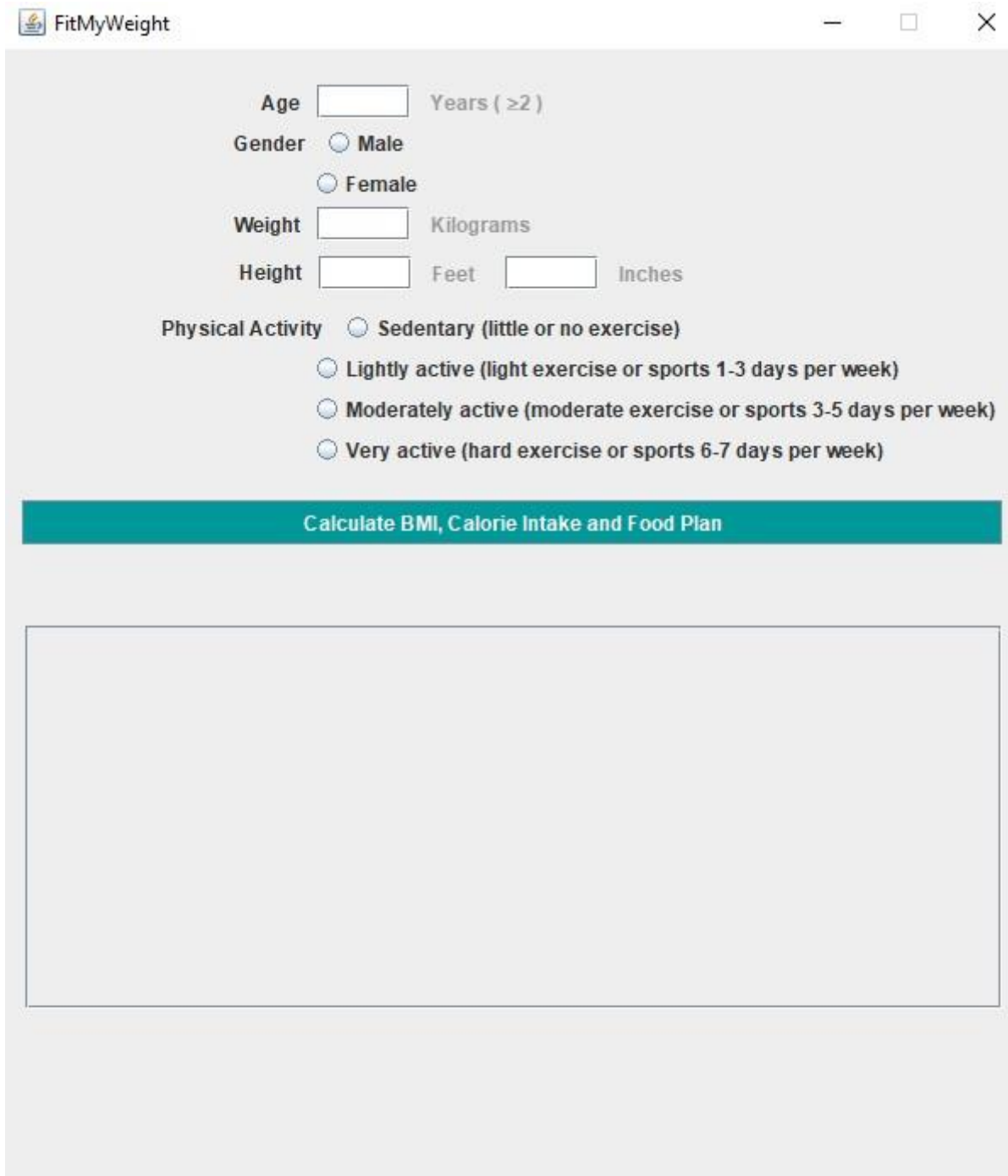
Data Storage

- Text Files

Project's Internal Structure



Output of the Project



The screenshot shows a web application window titled "FitMyWeight". The interface is light gray with a teal button. It contains several input fields and radio buttons for user information and activity level. Below the button is a large empty rectangular box for results.

Age Years (≥ 2)

Gender ☐ Male
☐ Female


Weight Kilograms

Height Feet Inches

Physical Activity ☐ Sedentary (little or no exercise)
☐ Lightly active (light exercise or sports 1-3 days per week)
☐ Moderately active (moderate exercise or sports 3-5 days per week)
☐ Very active (hard exercise or sports 6-7 days per week)

Calculate BMI, Calorie Intake and Food Plan

Screenshot 1: Initial interface of FitMyWeight

 FitMyWeight

Age Years (≥2)

Gender ☒ Male
☐ Female

Weight Kilograms

Height Feet Inches

Physical Activity ☐ Sedentary (little or no exercise)
☒ Lightly active (light exercise or sports 1-3 days per week)
☐ Moderately active (moderate exercise or sports 3-5 days per week)
☐ Very active (hard exercise or sports 6-7 days per week)

Calculate BMI, Calorie Intake and Food Plan

Your BMI: 21.79 Weight Status: Normal healthy weight

Daily calorie required for current weight maintainance: 2241 calories

Food plan for weight loss or gain: kg(s) in week(s) Loss Gain

Recommended daily food plan (maintenance):


Your daily food plan with recommended amounts for each food group:

Fruits: 2 cups
 1 cup from the Fruit Group counts as:
 - 1 cup raw, frozen, or cooked/canned fruit; or
 - 1/2 cup dried fruit; or
 - 1 cup 100% fruit juice

Vegetables: 3 cups
 1 cup from the Vegetable Group counts as:
 - 1 cup raw or cooked/canned vegetables; or
 - 2 cups leafy salad greens; or
 - 1 cup 100% vegetable juice

Consulting doctor and/or nutritionist is recommended.

Screenshot 2: Interface after first click on “Calculate BMI, Calorie Intake and Food Plan”

 FitMyWeight

Age

 Years (>2)

Gender
 ☒ Male
 ☐ Female

Weight

 Kilograms

Height

 Feet

 Inches

Physical Activity
 ☐ Sedentary (little or no exercise)
 ☒ Lightly active (light exercise or sports 1-3 days per week)
 ☐ Moderately active (moderate exercise or sports 3-5 days per week)
 ☐ Very active (hard exercise or sports 6-7 days per week)

Calculate BMI, Calorie Intake and Food Plan

Your BMI:
 21.79

Weight Status:
 Normal healthy weight

Daily calorie required for current weight maintainance:
 2241 calories

Food plan for weight loss or gain:

 kg(s) in

 week(s)

Recommended daily food plan (weight loss):


Your daily food plan with recommended amounts for each food group:

Fruits: 2 cups
 1 cup from the Fruit Group counts as:
 - 1 cup raw, frozen, or cooked/canned fruit; or
 - 1/2 cup dried fruit; or
 - 1 cup 100% fruit juice

Vegetables: 2 1/2 cups
 1 cup from the Vegetable Group counts as:
 - 1 cup raw or cooked/canned vegetables; or
 - 2 cups leafy salad greens; or
 - 1 cup 100% vegetable juice

Consulting doctor and/or nutritionist is recommended.

Screenshot 3: Food plan for weight gain

 FitMyWeight
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Age Years (≥2)
 Gender ☒ Male
 ☐ Female
 Weight Kilograms
 Height Feet Inches
 Physical Activity ☐ Sedentary (little or no exercise)
 ☒ Lightly active (light exercise or sports 1-3 days per week)
 ☐ Moderately active (moderate exercise or sports 3-5 days per week)
 ☐ Very active (hard exercise or sports 6-7 days per week)

Calculate BMI, Calorie Intake and Food Plan

Your BMI: 21.79 Weight Status: Normal healthy weight
 Daily calorie required for current weight maintenance: 2241 calories
 Food plan for weight loss or gain: kg(s) in week(s) Loss Gain

Recommended daily food plan (weight gain):


Your daily food plan with recommended amounts for each food group:

Fruits: 2 cups
 1 cup from the Fruit Group counts as:
 - 1 cup raw, frozen, or cooked/canned fruit; or
 - 1/2 cup dried fruit; or
 - 1 cup 100% fruit juice

 Vegetables: 3 cups
 1 cup from the Vegetable Group counts as:
 - 1 cup raw or cooked/canned vegetables; or
 - 2 cups leafy salad greens; or
 - 1 cup 100% vegetable juice

Consulting doctor and/or nutritionist is recommended.

Screenshot 4: Food plan for weight gain for healthy weight user

 FitMyWeight

Age Years (≥ 2)
 Gender ☐ Male
 ☒ Female
 Weight Kilograms
 Height Feet Inches
 Physical Activity ☐ Sedentary (little or no exercise)
 ☐ Lightly active (light exercise or sports 1-3 days per week)
 ☒ Moderately active (moderate exercise or sports 3-5 days per week)
 ☐ Very active (hard exercise or sports 6-7 days per week)

Calculate BMI, Calorie Intake and Food Plan

Your BMI: 15.14 Weight Status: Severely underweight
 Daily calorie required for current weight maintenance: 1783 calories
 Food plan for weight loss or gain: kg(s) in week(s)

Recommended daily food plan (maintenance):


Your daily food plan with recommended amounts for each food group:

Fruits: 1 1/2 cups
 1 cup from the Fruit Group counts as:
 - 1 cup raw, frozen, or cooked/canned fruit; or
 - 1/2 cup dried fruit; or
 - 1 cup 100% fruit juice

 Vegetables: 2 cups
 1 cup from the Vegetable Group counts as:
 - 1 cup raw or cooked/canned vegetables; or
 - 2 cups leafy salad greens; or
 - 1 cup 100% vegetable juice

Consulting doctor and/or nutritionist is recommended.

Screenshot 5: Underweight with only weight maintenance and gain food plans

 FitMyWeight

Age Years (>2)
 Gender ☒ Male
 ☐ Female
 Weight Kilograms
 Height Feet Inches
 Physical Activity ☐ Sedentary (little or no exercise)
 ☐ Lightly active (light exercise or sports 1-3 days per week)
 ☒ Moderately active (moderate exercise or sports 3-5 days per week)
 ☐ Very active (hard exercise or sports 6-7 days per week)

Calculate BMI, Calorie Intake and Food Plan

Your BMI: 25.31 Weight Status: Overweight
 Daily calorie required for current weight maintenance: 2738 calories
 Food plan for weight loss or gain: kg(s) in week(s) Loss

Recommended daily food plan (maintenance):
 Your daily food plan with recommended amounts for each food group:
 Fruits: 2 cups
 1 cup from the Fruit Group counts as:
 - 1 cup raw, frozen, or cooked/canned fruit; or
 - 1/2 cup dried fruit; or
 - 1 cup 100% fruit juice
 Vegetables: 3 1/2 cups
 1 cup from the Vegetable Group counts as:
 - 1 cup raw or cooked/canned vegetables; or
 - 2 cups leafy salad greens; or
 - 1 cup 100% vegetable juice

Consulting doctor and/or nutritionist is recommended.

Screenshot 6: Overweight with only weight maintenance and loss food plan

Limitations of the Project

Since our project relies on BMI, BMR and physical activity, food plans are not distinguished for users with or without diseases in case of identical input information i.e. age, gender, weight, height and physical activity. Which means, FitMyWeight suggests the same food plan to two persons, one of them is healthy and the other is sick having identical age, gender, weight, height and physical activity. For that reason, this application also suggests consulting with a doctor and/or nutritionist.

Summary

FitMyWeight is an application that helps its users to maintain healthy weight.

References

- [1] <https://www.who.int/news-room/fact-sheets/detail/obesity-and-overweight>
- [2] <https://www.who.int/news-room/fact-sheets/detail/malnutrition>
- [3] <https://www.choosemyplate.gov/resources/MyPlatePlan>