De La Salle University - Manila

Term 3, A.Y. **2022-2023**

In partial

fulfillment of the

course

in **LBYCPEI (EQ3)**

FlashFitness

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June 26, 2023

I.   Introduction

In the fast-paced and demanding academic environment of DLSU students, the pursuit of excellence and high achievements often takes precedence over personal well-being. The relentless focus on studies and academic success can lead to neglecting physical and mental health, which is crucial for maintaining a healthy and fulfilling life. To address this said issue, our group proposed a project named "FlashFitness", a java based fitness app made specifically for Lasallian students. This app aims to empower students to take charge of their health and well-being by offering customizable workout plans based on their preferences. This will ensure that they can incorporate being physically active into their busy schedules.

These are the main parts of the FlashFitness application:

A. Calorie Intake

       The Calorie Intake part of the application calculates the total calories should the user intake in order to achieve his/her goals. It also calculates the macros which are the fats, carbs, and protein. The user needs 6 inputs in order to calculate the calorie intake and macros. These are the calorie goal which are calorie maintenance, deficit, or surplus. Then the user's gender which is male or female. Then the user will input his/her height, weight, and age. Lastly, The user will choose his/her activity level.

B. Exercise Database

       The exercise database is self-explanatory. It holds various exercises and techniques that the user can acquire. The database will offer exercises from various muscle groups such as chest, arms, abs, legs, and many more.

C. Workout Routines Recommendations

       Workout routine recommendations, recommends what routines the user can take and apply to the normal routine. The routine is not only per day but also per week. One of the most famous workout routines is the Upper-body and lower-body split routine, Push and Pull split routine, Arnold split, and many more. These routines can help the user reach his or her fitness goals.

II.   Methodology

Object-Oriented Design / OOP Pillars Implementation
- **Polymorphism:** The program will make use of methods in order to process the data inputs. These methods would pass information from one another. It will also calculate the needed data.

- **Encapsulation:** The program will use methods of encapsulation such as get and set. It would also declare classes and attributes such as Labels, Buttons, Stages, Scenes,s and many more. It would get data from TextBox, RadioButton, Button, and more. It would also set information to process information and calculate the needed data.

- **Polymorphism**: is where we use different methods to do different tasks. Methods such as calorieIntake() and more would be passed around in order to process the needed information.

- **Inheritance:** Inheritance such as a subclass(parent) and superclass(child) will be used in order to have a more organized process of information. One of these superclasses would be FlashFitness and FlashFitnessController.

- **Abstraction:** Abstract classes are an important part of the project. Abstract classes would be used for the JavaFX GUI as it is auto-generated by the IntelliJ application. We just need to change the class name to FlassFitness, FlashFitnessController, and more.

- **Graphical User Interface:** The Flash Project group would use JavaFX in order to create the FlashFitness application GUI. It would use various materials from JavaFX such as Labels, Textbox, RadioButton, AnchorPane, Scenes, Stage, and many more.

III. Project Description

IPO Diagram

INPUT	PROCESS	OUTPUT
Calorie Goal Gender Age Height Weight Activity Level Calorie Tracker Exercise Database Workout Routines Muscle Group: Chest Arms Abs Back Legs Hips Exit Button Back Button	I. BMR calculation: calculating the base metabolic rate from age, height, weight, and gender. II. Calorie Intake calculation: calculate how much calorie intake he/she must take to achieve his/her goals (calorie maintenance, deficit, surplus). III. Macros Intake calculation: it will take the amount of calorie intake to determine the amount of macros such as protein, fat, and carbs.	Calorie Intake Macros Exercise Demonstration Pictures Workout Routines Recommendation Program action from the buttons (Exit, back, etc.)

Flowchart

```
                    ┌─────────┐
                   (  Start   )
                    └────┬────┘
                         │
                         ▼
              ┌──────────────────────┐
             /   Display Main Menu   /
            └───────────┬──────────┘
                         │
                         ▼
              ┌──────────────────┐
             /    Read Input    /
            └─────────┬────────┘
                       │
                       ▼
                    ◇ Exercise ◇ ──Yes──▶ ┌──┤ exerciseDatabse() ├──┐
                      Database              └──────────────────────┘
                       │
                       No
                       │
                       ▼
                    ◇ Workout ◇ ──Yes──▶ ┌──┤ wrkoutRout() ├──┐
                      Routines             └──────────────────┘
                       │
                       No
                       │
                       ▼
                  ◇ Calorie Tracker ◇ ──Yes──▶ ┌──┤ calorieTracker() ├──┐
                       │                         └──────────────────────┘
                       No
                       │
                       ▼
               ┌──────────────┐
               │ Exit Program │
               └──────────────┘
```

```
┌─────────────────────┐
│   calorieTracker()  │
└─────────────────────┘
           │
           ▼
   ╱─────────────────╲
  ╱ Calorie Goal:     ╲
 ╱  Maintain,          ╲
 ╲  Deficit, Surplus   ╱
  ╲───────────────────╱
           │
           ▼
      ╱─────────╲
     ╱  Maintain ╲────────── Yes ──────┐
     ╲           ╱                      │
      ╲─────────╱                       │
           │                            │
          No                            │
           ▼                            │
      ╱─────────╲         ┌───────────────┐
     ╱  Deficit  ╲── Yes ─│ -500 calories │──┐
     ╲           ╱        │ in calorie    │  │
      ╲─────────╱         │ intake        │  │
           │              └───────────────┘  │
          No                                  │
           ▼                                  │
      ╱─────────╲         ┌───────────────┐  │
     ╱  Surplus  ╲── Yes ─│ +300 calories │──┤
     ╲           ╱        │ in calorie    │  │
      ╲─────────╱         │ intake        │  │
                          └───────────────┘  │
   ╱─────────────╲                           │
  ╱ Gender:       ╲◄──────────────────────────┘
 ╱  Male or        ╲
 ╲  Female         ╱
  ╲───────────────╱
        │
        ▼
   ╱─────────╲      ┌──────────────────────────┐
  ╱   Male    ╲─Yes─│ BMR = 10*Weight +        │
  ╲           ╱     │ 6.25*Height + 5*Age + 5  │──┐
   ╲─────────╱      └──────────────────────────┘  │
        │                                          │
       No                                          │
        ▼                                          │
   ╱─────────╲      ┌──────────────────────────┐  │
  ╱  Female   ╲─Yes─│ BMR = 10*Weight +        │  │
  ╲           ╱     │ 6.25*Height + 5*Age -161 │──┤
   ╲─────────╱      └──────────────────────────┘  │
                                                   │
   ╱─────────────╲                                 │
  ╱ Input Height  ╲◄────────────────────────────────┘
  ╲───────────────╱
        │
        ▼
   ╱─────────────╲
  ╱ Input         ╲
 ╱  Weight         ╲
  ╲───────────────╱
        │
        ▼
   ╱─────────────╲
  ╱ Input Age     ╲
  ╲───────────────╱
        │
        ▼
      ( A )
```

```
      ( A )
        │
        ▼
   ╱─────────╲
  ╱ Activity  ╲
 ╱  Level      ╲
  ╲───────────╱
        │
        ▼
   ╱─────────╲       ┌──────────────────┐
  ╱ Little or ╲─Yes─►│ CalInt = BMR*1.2 │──┐
  ╲ No exercise╱     └──────────────────┘  │
   ╲─────────╱                             │
        │                                  │
       No                                  │
        ▼                                  │
   ╱─────────╲       ┌────────────────────┐│
  ╱ Exercise 1-3╲Yes►│ CalInt = BMR*1.376 ││
  ╲ day a week ╱     └────────────────────┘│
   ╲─────────╱                             │
        │                                  │
       No                                  │
        ▼                                  │
   ╱─────────╲       ┌───────────────────┐ │
  ╱ Exercise 3-5╲Yes►│ CalInt = BMR*1.55 │ │
  ╲ day a week ╱     └───────────────────┘ │
   ╲─────────╱                             │
        │                                  │
       No                                  │
        ▼                                  │
   ╱─────────╲       ┌────────────────────┐│
  ╱ Exercise 6-7╲Yes►│ CalInt = BMR*1.725 ││
  ╲ day a week ╱     └────────────────────┘│
   ╲─────────╱                             │
        │                                  │
       No                                  │
        ▼                                  │
   ╱─────────╲       ┌──────────────────┐  │
  ╱ Extra Active╲Yes►│ CalInt = BMR*1.9 │  │
  ╲ Exercise a  ╱    └──────────────────┘  │
  ╲  week      ╱                           │
   ╲─────────╱                             │
        │                                  │
        ▼                                  │
   ╱─────────────╲◄──────────────────────────┘
  ╱ Display Calorie╲
 ╱  Intake          ╲
  ╲───────────────╱
        │
        ▼
   ┌──────────────────────────────┐
   │ Protein = calorie intake x .3 /4 │
   │ Fats = calorie intake x .3 / 9   │
   │ Carbs = calorie intake x .4 /4   │
   └──────────────────────────────┘
        │
        ▼
   ╱─────────────╲
  ╱ Display Macros:╲
 ╱  Protein, Fats,  ╲
 ╲  Carbs           ╱
  ╲───────────────╱
        │
        ▼
   ╱─────────╲
  ╱  Back     ╲
  ╲───────────╱
```

```
exerciseDatabse()
        |
        v
Display Muscle Group
    optioins
        |
        v
    Chest  --Yes-->  Display Chest Exercises
        |
        No
        v
    Arms   --Yes-->  Display Arms Exercises
        |
        No
        v
    Abs    --Yes-->  Display Abs Exercies
        |
        No
        v
    Back   --Yes-->  Display Back Exercies
        |
        No
        v
    Legs   --Yes-->  Display Legs Exerces
        |
        v
     Back
```

```
wrkoutRout()
        |
        v
Display Different Workout
      Routines
        |
        v
     Back
```

UML Diagram

IV.   Deliverables

Gantt Diagram

Task	Responsible	Duration Deadline
Project Planning	Flash Team	Before June 26, 2023
Final Project Proposal	Flash Team	June 26, 2023
Coding	FlashTeam	June 26-Jul 24, 2023

Project/Document Review	FlashTeam	July 10, 2023
Demonstration	FlashTeam	July 24, 2023
Project Submission	FlashTeam	July 31, 2023

V.   Evaluation

The first evaluation was that the group would check the number of errors and bugs encountered during the test runs of the program application. Second, is the quality that it gives when it comes to calculating data, providing the correct information to the user, and many more. The group will also check if the graphical user interface (GUI) is cut enough.

VI.   Conclusion

The group's eagerness to develop and produce the "FlashFitness" application is fueled by the impact it can have on the lives of Lasallian students. By providing a comprehensive solution to enhance their lifestyles, bodies, and overall health, the app has the potential to create a positive and transformative experience for its users. Moreover, this will serve as a pivotal test of the group members' acquired knowledge and skills from this course, offering them a

real-world opportunity to apply everything they have learned in a practical and meaningful way. With a deep understanding of the challenges faced by the students in maintaining a balance between academic pursuit and self care, our proposed application will serve as a beacon of hope. We are dedicated to making this application accessible to DLSU students to provide and ensure effectiveness and relevance to the said issue.

VII.   References

- https://www.bodybuilding.com/content/from-here-to-macros-4-steps-to-better-nutrition.html

- https://devm.io/java/20-javafx-real-world-applications-123653
- https://www.startechup.com/blog/app-development-with-java/