Deliverable 1 - Project Description: MoneyReps

Scenario

MoneyReps is a fitness game that is utilized to track repetitions while exercising and compensate users with points based on repetitions completed and the difficulty level of each exercise. It is intended for personal fitness enthusiasts, gyms, or fitness competitions where participants receive redeemable points for training.

Design Paradigm

The app will require the following functionalities:
- User login as Athlete or Trainer.
- Athletes can:
- Record exercises and reps done.
- Receive points based on difficulty and reps.
- View total earnings and exercise history.
- Trainers can:
- Insert or update exercises with levels of difficulty.
- Schedule workouts for athletes.
- View athlete performance.

Expected Output

- Athletes log reps per exercise and see their earnings.
- Earnings accumulate with each workout.
- Trainers manage available exercises and review athlete stats.
- Users can view earnings summaries and history of workouts.

Hierarchies

1. User → Trainer / Athlete
- Trainer assigns workouts and manages exercises.
- Athlete performs exercises and tracks earnings.

2. Exercise → Push / Pull / Core
  - Each exercise subclass has its own difficulty multiplier and rep logic.

Interface Specification

Interface Name: Redeemable
- Declare the calculateEarnings(int reps) method for exercises.
- Ensures every exercise implements how many points per rep based on its own difficulty logic.

Runtime Polymorphism

-        calculateEarnings(int reps) method from Redeemable is applied differently in each Exercise subclass based on difficulty.
-        displayDetails() is overridden in each Exercise subclass in order to show exercise-specific info.

TextIO Usage

Class: MainMenu
- Interacts with the user for login, entering reps, and displaying earnings.
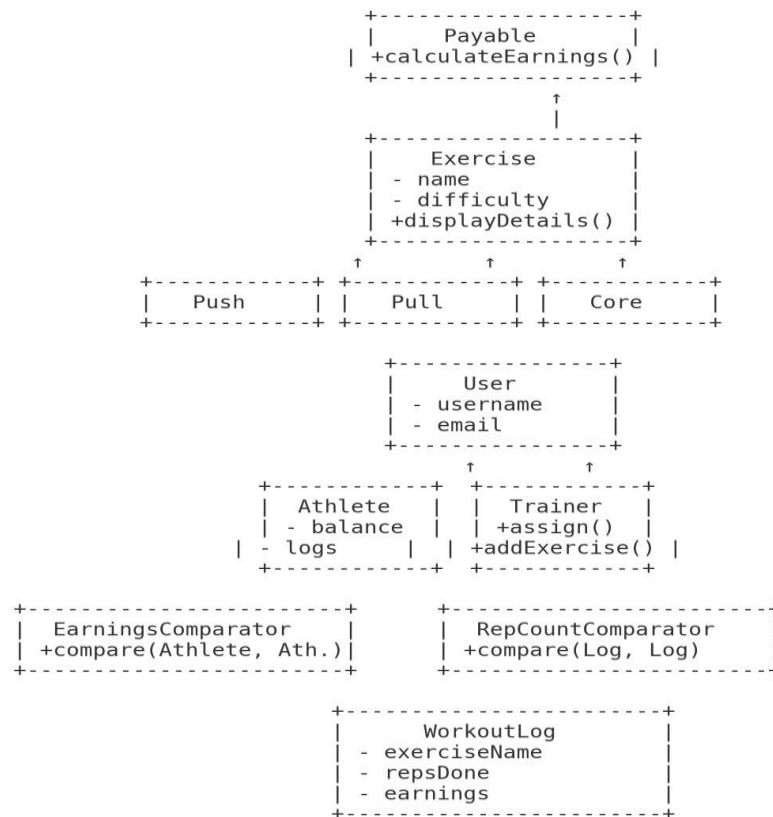
Comparable Implementation

Class: Exercise
- Comparable<Exercise> to sort exercises by difficulty level.

Comparator Needed

- EarningsComparator Class→ Sorts athletes based on total earnings.
- RepCountComparator Class → Sorts workout logs by number of reps completed.

Class diagram

```
                        +-------------------+
                        |      Payable      |
                        | +calculateEarnings() |
                        +-------------------+
                                  ↑
                                  |
                        +-------------------+
                        |     Exercise      |
                        | - name            |
                        | - difficulty      |
                        | +displayDetails() |
                        +-------------------+
                    ↑             ↑             ↑
     +------------+ +------------+ +------------+
     |   Push     | |   Pull     | |   Core     |
     +------------+ +------------+ +------------+

                        +----------------+
                        |      User      |
                        | - username     |
                        | - email        |
                        +----------------+
                           ↑          ↑
         +------------+  +------------+
         |  Athlete   |  |  Trainer   |
         | - balance  |  | +assign()  |
         | - logs     |  | +addExercise() |
         +------------+  +------------+

 +------------------------+      +------------------------+
 |   EarningsComparator   |      |   RepCountComparator   |
 | +compare(Athlete, Ath.)|      | +compare(Log, Log)     |
 +------------------------+      +------------------------+

                   +------------------------+
                   |      WorkoutLog        |
                   | - exerciseName         |
                   | - repsDone             |
                   | - earnings             |
                   +------------------------+
```

Deliverable 2 Scope

Classes:

- User, Athlete, Exercise, PushUp, MainMenu, WorkoutLog

Interfaces:

- Redeemable

Methods:

- calculateEarnings() for PushUp
- logExercise() in Athlete
- compare() in EarningsComparator

Git Repository

https://github.com/Nads24/MoneyReps