

Flex

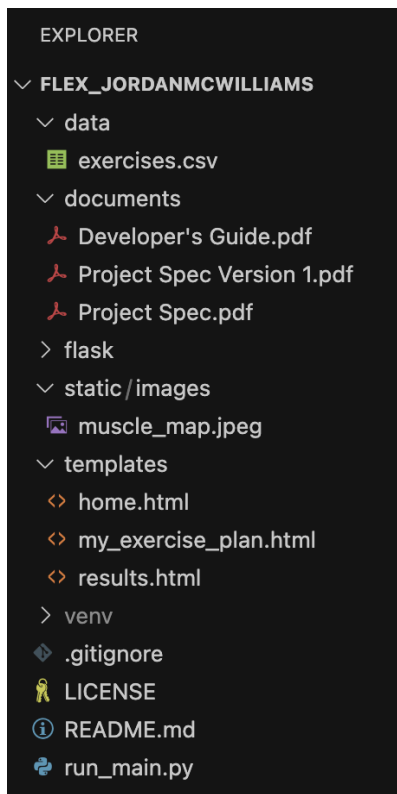
I. Overview

Flex is an app that provides exercises for specific targeted muscle groups using the existing exercises.csv dataset. First, the user is provided with the option to filter exercises by difficulty level. Second, the user interacts with a visual of the human muscular system to select a muscle and direct to a page of search results. Users can develop a plan targeting as many muscles as they would like. This plan can be printed or exported for later use. This application was developed using a web-based graphical user interface, Flask. This purpose of this guide is to help developers install, understand, and run Flex.

I. Implementation Summary

- A. Home web interface that grants users the option to search for exercises by muscle
- B. Interactive image with clickable muscle buttons for searching
- C. Option to filter exercises by difficulty level
- D. Ability to add exercises to “My Exercise Plan” with user feedback
- E. Option to continue searching for exercises while temporary plan is stored
- F. Option to delete exercises from “My Exercise Plan” with feedback
- G. Ability to print or save “My Exercise Plan”

II. File Organization



III. Running the app

`run_main.py` is the file that starts the app. Run the file and click <http://127.0.0.1:5000> to begin.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
source "/Users/jordanmcwilliams/Desktop/ISU MHCI/Summer 2025/HCI 5840/Project/GitHub/Flex_JordanMcWilliams/venv/bin/activate"
jordanmcwilliams@MacBook-Air Flex_JordanMcWilliams % source "/Users/jordanmcwilliams/Desktop/ISU M
HCI/Summer 2025/HCI 5840/Project/GitHub/Flex_JordanMcWilliams/venv/bin/activate"
(venv) jordanmcwilliams@MacBook-Air Flex_JordanMcWilliams % "/Users/jordanmcwilliams/Desktop/ISU M
HCI/Summer 2025/HCI 5840/Project/GitHub/Flex_JordanMcWilliams/venv/bin/python" "/Users/jordanmcwil
liams/Desktop/ISU MHCI/Summer 2025/HCI 5840/Project/GitHub/Flex_JordanMcWilliams/run_main.py"
Current working directory: /Users/jordanmcwilliams/Desktop/ISU MHCI/Summer 2025/HCI 5840/Project/GitHub/Flex_JordanMcWilliams
* Serving Flask app 'run_main'
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on http://127.0.0.1:5000
Press CTRL+C to quit
```

IV. User Interaction Flow

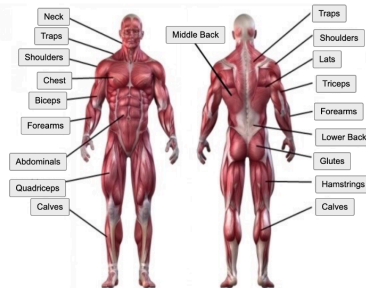
A. Home Page: `home.html`

- Users select a difficulty level and click a button on the muscle image to search

Flex

Build your own exercise plan.

1. Select an exercise difficulty:
2. Select a muscle using the image below:



B. Results Page: `results.html`

- Displays a list of filtered results based on user input on the home page
- Option to add each exercise to “My Exercise Plan”

Results Page

Results

Exercises for middle back

- **Bent Over Barbell Row**
Muscle: ["middle back"]
Difficulty: beginner
Instructions: ["Holding a barbell with a pronated grip (palms facing down), bend your knees slightly and bring your torso forward, by bending at the waist, while keeping the back straight until it is almost parallel to the floor. Tip: Make sure that you keep the head up. The barbell should hang directly in front of you as your arms hang perpendicular to the floor and your torso. This is your starting position.", "Now, while keeping the torso stationary, breathe out and lift the barbell to you. Keep the elbows close to the body and only use the forearms to hold the weight. At the top contracted position, squeeze the back muscles and hold for a brief pause.", "Then inhale and slowly lower the barbell back to the starting position.", "Repeat for the recommended amount of repetitions."] [Add to My Exercise Plan](#)
- **Bent Over One-Arm Long Bar Row**
Muscle: ["middle back"]
Difficulty: beginner
Instructions: ["Put weight on one of the ends of an Olympic barbell. Make sure that you either place the other end of the barbell in the corner of two walls; or put a heavy object on the ground so the barbell cannot slide backward.", "Bend forward until your torso is as close to parallel with the floor as you can and keep your knees slightly bent.", "Now grab the bar with one arm just behind the plates on the side where the weight was placed and put your other hand on your knee. This will be your starting position.", "Pull the bar straight up with your elbow in (to maximize back stimulation) until the plates touch your lower chest. Squeeze the back muscles as you lift the weight up and hold for a second at the top of the movement. Breathe out as you lift the weight. Tip: Do not allow for any swinging of the torso. Only the arm should move.", "Slowly lower the bar to the starting position getting a nice stretch on the lats. Tip: Do not let the plates touch the floor. To ensure the best range of motion, I recommend using small plates (25-lb ones) as opposed to larger plates (like 35-45lb ones).", "Repeat for the recommended amount of repetitions and switch arms."] [Add to My Exercise Plan](#)
- **Bent Over Two-Dumbbell Row**

C. My Exercise Plan Page: `my_exercise_plan.html`

- List of all exercises added to “My Exercise Plan”
- Option to delete each exercise on “My Exercise Plan”
- Option to print or save the page as a pdf

My Exercise Plan

[Print or Save My Exercise Plan](#)

- **Straight Bar Bench Mid Rows**

Muscle: ["middle back"]

Difficulty: beginner

Instructions: ["Place a loaded barbell on the end of a bench. Standing on the bench behind the bar, take a medium, pronated grip. Stand with your hips back and chest up, maintaining a neutral spine. This will be your starting position.", "Row the bar to your torso by retracting the shoulder blades and flexing the elbows. Use a controlled movement with no jerking.", "After a brief pause, slowly return the bar to the starting position, ensuring to go all the way down."]"]

[Delete](#)

- **T-Bar Row with Handle**

Muscle: ["middle back"]

Difficulty: beginner

Instructions: ["Position a bar into a landmine or in a corner to keep it from moving. Load an appropriate weight onto your end.", "Stand over the bar, and position a Double D row handle around the bar next to the collar. Using your hips and legs, rise to a standing position.", "Assume a wide stance with your hips back and your chest up. Your arms should be extended. This will be your starting position.", "Pull the weight to your upper abdomen by retracting the shoulder blades and flexing the elbows. Do not jerk the weight or cheat during the movement.", "After a brief pause, return to the starting position."]"]

[Delete](#)

[Go to Home Page](#)

V. Functions

- home()** renders the “Home” page
- search()** handles requests for specific muscle types and difficulty levels, returning the “Results” page with a filtered list of exercises
- add_to_plan()** updates “My Exercise Plan” page with an exercise unless it is a duplicate
- view_plan()** renders the “My Exercise Plan” page
- delete_from_plan()** removes an exercise from “My Exercise Plan” and redirects to view_plan

VI. Known Issues

- Difficulty maintaining flash messaging to provide user feedback when adding exercises
- No feedback when the same exercise is added twice
- Plan store is only temporary and not user specific

VII. Future Work

- Improve user feedback when exercises are added
- Improve overall design and appearance of app and results
- Allow for more search filter options (equipment, force, etc.)
- Shift design to mobile app