

**Will Bogatyrenko and Danzan Achit-Erdene**  
**CS 0318**  
**Final Project Writeup**  
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a. Our program is a fitness app designed to help the user put together a productive workout program with the equipment available to them. The code uses (from left to right):

- A QLabel that changes with the selection of the tree widget
- A QTreeWidget that holds the list of exercises and the equipment needed to perform the exercise
  - We populate this from a file specified by the file path
- Buttons labeled 'Add' and 'Remove' that adds and removes exercises from the QListWidget
  - The add button looks through the list widget for matching text with the selected tree widget item and removes it
- A QListWidget that holds the routine of the user
  - Each element is copied over from the QTreeWidget
- A MuscleMap that displays the muscle groups being hit
  - The program loops through the muscle bits and then specifies what color it should paint the muscle group by the number of times it is being hit within the routine

These QWidgets use:

- An encoding of the muscle, specified by an enum variable in "muscleencoding.h"
  - This is a combination of bits shifted by the number of muscle groups
    - Any combination of muscles are possible
- A list of the exercises that is populated once the program starts

b. Our program's current features are:

- A column listing various exercises, with dropdown menus for each exercise listing the equipment needed
  - A picture showing the exercise equipment needed to perform the exercise
- A function to add exercises into a workout plan
  - Also works with the 'return' key
- A function to remove exercises from a workout plan
  - Also works with the 'backspace' key
- A diagram of the body's muscles
  - When a muscle is clicked, it is highlighted and the exercises in the left column are filtered to include only those targeting that muscle

- When an exercise is clicked, the diagram highlights both the primary and secondary muscle groups targeted by that exercise
- Multiple muscle groups can be selected at the same time, allowing users to see workouts targeting muscle groups as specifically as they want
- A button to analyze the exercises selected into the workout plan
  - When clicked, it highlights the all of the muscle groups that are targeted and the magnitude they are worked by the current program
- A button to print a chart listing the exercises selected, as well as blank columns for the user to input the number of sets and reps they would like to perform for each exercise

c. The program's interface initially consists of three parts. The leftmost column lists available workouts and the equipment needed to use them, the middle column is where the user can add the exercises they want to put into their workout plan, and the rightmost column contains a diagram of the body's muscles programmed as a heat map. The program is designed to work multidirectionally. This means that users can select muscles on the diagram of the body, and the exercises in the leftmost column will be filtered to only those that target the selected muscle groups. Users can also select a particular exercise in the leftmost column, and the muscle groups that are targeted by the selected exercise will be highlighted on the diagram of the body. If a user clicks the dropdown arrow next to a particular exercise, the equipment needed to perform that exercise shows up below, and when each piece of equipment is selected a picture of it shows up to the left. Users can add exercises into their workout plan (in the middle column) by selecting an exercise and clicking the "add" button. They can remove exercises from their workout plan by selecting one and clicking the "remove" button. Once they have added all of the exercises they want in their workout plan, they can click the "analyze" button. All of the muscles that will be targeted with the compiled plan will be highlighted in the diagram, and the extent to which each muscle group is targeted will be displayed through the color each muscle group is highlighted. There is a range of magnitudes with values 1-5, 1 being targeted the least amount and 5 the absolute maximum. 1 is yellow, 2 is green, 3 is teal, 4 is blue, and 5 is pink. Once the user has chosen their workout plan, they can click the "print" button. This will print a chart with a column for exercises, sets, and reps. The "exercises" column will be populated with the exercises the user selected, while the other two columns will be populated with blank cells, so the user can choose the number of sets and reps they want to do for each exercise and input those numbers themselves.