

Chapter 4 Projects

1. Mass and Weight App

Scientists measure an object's mass in kilograms and its weight in newtons. If you know the amount of mass of an object, you can calculate its weight, in newtons, with the following formula:

$$\text{Weight} = \text{Mass} \times 9.8$$

Create an app that lets the user enter an object's mass and then calculates its weight.

If the object weighs more than 1000 newtons, display a message indicating that it is too heavy.

If the object weighs less than 10 newtons, display a message indicating that it is too light.

2. Change-Counting App

Create a change-counting game that gets the user to enter the number of coins required to make exactly one dollar. The program should let the user enter the number of pennies, nickels, dimes, and quarters. If the total value of the coins entered is equal to one dollar, the program should congratulate the user for winning the game. Otherwise, the program should display a message indicating whether the amount entered was more than or less than one dollar.

3. Fat Percentage Calculator App

One gram of fat has 9 calories. If you know the number of fat grams in a particular food, you can use the following formula to calculate the number of calories that come from fat in that food:

$$\text{Calories from fat} = \text{fat grams} \times 9$$

If you know the food's total calories, you can use the following formula to calculate the percentage of calories from fat:

$$\text{Percentage of calories from fat} = \text{Calories from fat} \div \text{total calories}$$

Create an app that allows the user to enter: The total number of calories for a food item and the number of fat grams in that food item The app should calculate and display: The number of calories from fat and the percentage of calories that come from fat. Also, the app's screen should have a CheckBox that the user can check if they want to know whether the food is considered low fat. (If the calories from fat are less than 30% of the total calories of the food, the food is considered low fat.) Use the following test data to determine if the app is calculating properly:

Calories and Fat	Percentage Fat
200 calories, 8 fat grams	Percentage of calories from fat: 36%
150 calories – fat grams	Percentage of calories from fat: 12% (a low-fat food)
500 calories, 30 fat grams	Percentage of calories from fat: 54%

4. Workshop Selector App

Create an app that lets the user select a workshop from one ListPicker and a location from another ListPicker. When the user clicks a button, the app should calculate and display the registration cost, the lodging cost, and the total cost.

The following table shows the training company's workshops, the number of days of each, and their registration fees.

Workshop	Number of Days	Registration Fee
Time Management	2	\$800
Supervision Skills	3	\$1,500
Negotiation	5	\$1,300

The training company conducts its workshops in the three locations shown in the following table. The table also shows the lodging fees per day at each location.

Location	Lodging Fees per Day
Chicago	\$225
Dallas	\$175
Orlando	\$300

When a customer registers for a workshop, he or she must pay the registration fee plus the lodging fees for the selected location. **For example**, here are the charges to attend the Supervision Skills workshop in Orlando:

- Registration: \$1,500
- Lodging: $\$300 \times 3 \text{ days} = \900
- Total: \$2,400