Problem Set 2 Exercise #30: Health Food and Fast Food Meals

Reference: Lecture 6 notes

Learning objectives: Functions with Pointers; Algorithm design

Estimated completion time: 70 minutes

Problem statement:

[Past year CS1010 PE Question]

Fabulous Hong's parents are away for a holiday. He is given a *budget* and he only has two choices: fast-food meal at a cost of *ff_cost* per meal, or health-food meal at a cost of *hf_cost* per meal.

Note that *budget*, *ff_cost* and *hf_cost* are all positive integers in dollars.

Fabulous wants to spend as much as is allowed by his budget. If there is more than one plan that makes this possible, then being a health-conscious person, he will choose the plan with more health-food meals. There is no constraint on the number of meals he must take.

You are to help Fabulous plan his meals. Write a program **food.c** that asks for 3 inputs: *budget*, *ff_cost* and *hf_cost*, and determines how many fast-food meals and health-food meals Fabulous can take while spending as much as possible.

Your program should contain a function

```
void best_combination(int budget, int ff_cost,
        int hf_cost, int *final_ff_num, int *final_hf_num)
```

that find out the best solution.

Sample run #1 shows an example where Fabulous will take 8 fast-food meals and 1 health-food meal, spending a total of $122. No other plan allows him to spend more than that without exceeding his budget. For example, if he takes 3 fast-food meals ($39) and 4 health-food meals ($72), he will spend only $111.

Sample run #2 shows another example where Fabulous will take 2 fast-food meals and 12 health-food meals, spending a total of $50. There is another plan that allows him to spend a total of $50, by taking 5 fast-food meals and 5 health-food meals. Since he prefers to take more health-food meals, the former is better.

Sample run #1:

```
Enter budget: $123
Enter fast-food cost per meal: $13
Enter health-food cost per meal: $18
Number of fast-food meals = 8
Number of health-food meals = 1
```

Sample run #2:

```
Enter budget: $50
Enter fast-food cost per meal: $7
Enter health-food cost per meal: $3
Number of fast-food meals = 2
Number of health-food meals = 12
```