Laboratory 3

CS 1323, Spring 2015

# Objectives

1. Compile and execute a computer program. (10 points)
2. Construct a Scanner object attached to the console. (10 points)
3. Read input using a Scanner object. (10 points)
4. Close the Scanner object. (10 points)
5. Perform rounding using the round method in the Math class. (20 points)
6. Use several constants (must use constants in all appropriate places to get full credit). (10 points)
7. Perform arithmetic operations that correctly implement a given task. (10 points)
8. Use tabs and newlines to nicely format output to the console. (10 points)

10 points will be awarded for the documentation of your program. That means using good names for variables, proper and consistent indentation of code, and meaningful use of whitespace.

Section 10: When your program is completed and running, have the teaching assistants check it to get credit for the lab. Both partners should have a copy of the code developed at the end of the laboratory. Also both students should upload their code to Janux. Make sure you put both of your names in your code. If you do not complete your work during lab, the laboratory assignment must be completed and submitted individually on Janux by 11:59 p.m. on February 4.

Section 1: The laboratory assignment must be completed and submitted on Janux by 11:59 p.m. on February 4.

# Description

Most gyms have a chart on the wall that shows what your heart rate should be based on your age and fitness goals. These charts are loosely based on work done by the American Heart Association that shows ranges that are generally safe and beneficial for most people, although of course your mileage may vary.

Your maximum heart rate (beats per minute) is supposed to be 220 minus your age.

Your target heart rate is supposed to be between 50-85% of your maximum heart rate. One website I visited[[1]](#footnote-1): broke the ranges down as shown in the chart on the next page

|  |  |
| --- | --- |
| **Name of Zone** | **Heart rate** |
| Healthy Zone | 50-60 % of maximum heart rate |
| Fitness Zone | 60-70% of maximum heart rate |
| Aerobic Zone | 70-80% of maximum heart rate |
| Anaerobic Zone | 80-90% of maximum heart rate |
| Red-Line Zone | 90-100% of maximum heart rate |

The problem with these charts is that people don’t usually count heart beats for a whole minute. They usually count for just fifteen seconds (1/4 of a minute).

Let’s say that person using the program was 20 years old. Their maximum heart rate should be 200 beats per minute. The healthy heart zone rate for this person would be 25-30 beats per fifteen seconds. Now you’ll notice that I cleverly picked an age where everything worked out perfectly. This is not typically going to happen. When the values do not work out to integral values, you need to round using the method that we discussed in class (Math.round).

Write a program that makes a chart for a given individual. The person should enter their name and year of birth. The chart should contain ranges of heart beats in each category and be nicely organized and easily readable.

Here is a sample run of the program:

Please enter your name

Deborah

Please enter your year of birth

1995

Heart rate chart for: Deborah

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Healthy Zone 25 30

Fitness Zone 30 35

Aerobic Zone 35 40

Anaerobic Zone 40 45

Red-Line Zone 45 50

1. http://walking.about.com/cs/fitnesswalking/a/hearttraining\_2.htm?utm\_term=workout%20heart%20rate%20chart&utm\_content=p1-main-2-title&utm\_medium=sem&utm\_source=msn&utm\_campaign=adid-65ec18f2-b9bd-4e4b-ae44-2d9747265667-0-ab\_msb\_ocode-4554&ad=semD&an=msn\_s&am=broad&q=workout%20heart%20rate%20chart&dqi=&o=4554&l=sem&qsrc=999&askid=65ec18f2-b9bd-4e4b-ae44-2d9747265667-0-ab\_msb [↑](#footnote-ref-1)