

Problem Set 1 Exercise #21: Computing SAT and IQ Scores

Reference: Week 4 Lecture notes

Learning objectives: Selection statements

Estimated completion time: 35 minutes

Problem statement:

[CS1010 AY2012/13 Semester 1 Practical Exam 1 Exercise 1]

The SAT is a standardized test for college admissions in the United States. It comprises 3 major sections: Verbal, Maths, and Writing. Each section has a score on the scale of 200 to 800. The SAT score is computed by adding up the scores of these 3 sections. The following chart shows the percentiles that various SAT scores correspond to:

SAT score	Percentile
2200	99
2000	95
1500	50
< 1500	10

Note that percentile 99 means better than 99% of the people who took the test.

The SAT scores have been found to be highly correlated to IQ test scores. The following formula uses the scores for the Maths and Verbal sections to obtain an IQ score (of type **double**):

$$\text{IQ} = (0.095 * \text{Maths}) + (0.003 * \text{Verbal}) + 50.241$$

Write a program **sat.c** to read in the scores for the 3 sections in the SAT and determine the percentile of the SAT score as well as the equivalent IQ score. Your program should print the percentile of the SAT score as well as the corresponding IQ score. In addition, if every score for the 3 sections in the SAT is greater than 600, or the IQ score is at least 120, then print the message "Wow, this is amazing!".

Your program should include two functions **compute_percentile()** and **compute_iqscore()** which determine the percentile of the SAT score and the IQ score respectively.

You may assume that the scores entered are all positive integers of type **int** and are in the range of 200 to 800. Correct your output of real number to two decimal places.

In the sample runs shown below, the scores are entered in the order of Verbal, Maths, and Writing.

Sample run #1:

```
Enter scores: 200 300 400
The SAT score is in the 10 percentile.
The IQ score is 79.34
```

Sample run #2:

```
Enter scores: 610 610 610
The SAT score is in the 50 percentile.
The IQ score is 110.02
Wow, this is amazing!
```

Sample run #3:

```
Enter scores: 600 700 790
The SAT score is in the 95 percentile.
The IQ score is 118.54
```

Sample run #4:

```
Enter scores: 780 800 480
The SAT score is in the 95 percentile.
The IQ score is 128.58
Wow, this is amazing!
```