

## Exercise 1: Computing SAT and IQ Scores (50 marks)

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
$\geq 2200$	99*
$\geq 2000$	95
$\geq 1500$	50
$< 1500$	10

\* 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 **float**):

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

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 are to determine for each function what its parameter(s) is/are.

If you have no function other than the main function in your program, marks will be deducted on design.

You may assume that the scores entered are all positive integers of type **int** and are in the range of 200 to 800.

Four sample runs are shown below, with user input shown in **bold**. The scores entered are in the order of Verbal, Maths, and Writing.

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

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

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

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

### **Skeleton Program:**

A skeleton program **sat.c** is available in your plab account and is shown below.

```
// CS1010 AY2012/3 Semester 1
// PE1 Ex1: sat.c
// Name:
// Matriculation number:
// plab account-id:
// Discussion group:
// Description:

int main(void) {
    int verbal, maths, writing ; // user's input

    printf("Enter scores: ");

    return 0;
}
```