

# DWITE Online Computer Programming Contest

October 2006

## Problem 2

### Body Mass Index

The body mass index (BMI) is the statistical measure of the weight of a person scaled according to height.

BMI is defined as the individual's body weight divided by the square of the height, and is almost always expressed in the unit  $\text{kg} / \text{m}^2$ , which is therefore often left out.

For the metric system, BMI is calculated as follows: 
$$BMI = \frac{\text{weight}(\text{kg})}{\text{height} \times \text{height}(\text{m} \times \text{m})}$$

For the imperial system, BMI is calculated as follows: 
$$BMI = \frac{\text{weight}(\text{lb})}{\text{height} \times \text{height}(\text{in} \times \text{in})} \times 703$$



The following are common definitions of BMI categories:

Starvation:	less than 15
Underweight:	15 to less than 18.5
Ideal:	from 18.5 to 25 inclusive
Overweight:	from over 25 to 30
Obese:	from over 30 to 40
Morbidly Obese:	greater than 40

For this problem, you are to calculate a person's BMI and BMI category, given their height and weight.

The input file (**DATA21.txt** for the first submission and **DATA22.txt** for the second submission) will contain five sets of data. Each set of data will contain two lines of data. The first line of each set will contain two numbers, separated by a single space,  $h$  and  $w$ , that represent the person's height and weight respectfully.  $0 < h < 100$ .  $0 < w < 1000$ . The second line will contain the measurement system, either METRIC or IMPERIAL.

The output file (**OUT21.txt** for the first submission and **OUT22.txt** for the second submission) will contain five lines of data, corresponding to each set of the input file. Each line will contain the person's BMI, accurate to two decimal places, a hyphen, and then their BMI category, in uppercase (STARVATION, UNDERWEIGHT, IDEAL, OVERWEIGHT, OBESE, MORBIDLY OBESE).

<u>Sample Input (2 sets of data only)</u>	<u>Sample Output</u>
70 250 IMPERIAL	35.87-OBESE
1.90 104 METRIC	28.81-OVERWEIGHT

For more information about BMI, visit [http://en.wikipedia.org/wiki/Body\\_mass\\_index](http://en.wikipedia.org/wiki/Body_mass_index)