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| Computer Programming Language |

【Fall, 2015】

Homework 2

**Program A： Simple arithmetic calculation (25%)**

Write a program that inputs three integers from the keyboard and show the sum, average, product, smallest and largest of these numbers. The screen dialog should appear as following example:

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| Input three different integers: 13 27 17  Sum is 57  Average is 19  Product is 5967  Smallest number is 13  Largest number is 27 |

**Program B： Simple arithmetic calculation (25%)**

Write a program that estimates and displays the temperature in a freezer (in °C) given the elapsed time (hours) since a power failure. Assume this temperature (*T*) is given by

where *t* is the time since the power failure. Your program should prompt the user to enter how long it has been since the start of the power failure in whole hours and minutes. Note that you will need to convert the elapsed time into hours. For example, if the user entered 2 30 (2 hours 30 minutes), you would need to convert this to 2.5 hours.

**Program C： Basal metabolic rate calculation (25%)**

The Harris-Benedict equation estimates the number of calories your body needs to maintain your weight if you do no exercise. This is called your basal metabolic rate, or BMR. The formula for the calories needed for a woman to maintain her weight is:

The formula for the calories needed for a man to maintain his weight is

A typical chocolate bar will contain around 230 calories. Write a program that allows the user to input his or her weight in kilograms, height in centimeters, age in years, and the character 'M' for male and 'F' for female. The program should then output the number of chocolate bars that should be consumed to maintain one's weight for the appropriate sex of the specified weight, height, and age. Check the results from your program with any BMR calculators on the internet.

**Program D：Game of blackjack (25%)**

In the game of blackjack, the cards 2 through 10 are counted at their face values, regardless of suit; all face cards (jack, queen, and king) are counted as 10; and an ace is counted as a 1 or 11, depending on the total count of all cards in a player’s hand. The ace is counted as 11 only if the resulting total value of all cards in a player’s hand doesn’t exceed 21; otherwise, it’s counted as 1. Using this information, write a C++ program that accepts three card values as inputs (a 1 corresponding to an ace, a 2 corresponding to a two, and so on), calculates and display the total value of the hand, and the value of the three cards.

**Notes:**

1. Please submit your programs (source codes and execution files) to the CEIBA course website before **Oct. 15**. Hand in the hardcopies of your program codes in the class of **Oct. 15 (3:30PM)**.
2. Late submission will have a penalty of 10% discount per day of your grade toward a minimum score of 60. No late submission over a week will be accepted.
3. Criteria of grading include: (1) Program functionality; (2). User interface; (3). Structure of the program; (4). Suitable comments; (5). Programming style; (6). Creativity.