Programming Exam, COMP 2130, Winter 2013

Student Name: Student Number:

1. (10 marks) Write a function that has two integer parameters ***x*** and ***y***, and returns an integer value ***z***. The return value ***z*** is made using ***x*** and ***y*** in the following way:

The 1st byte of ***z*** = the 1st byte of ***x*** BITWISE\_AND the 1st byte of ***y***.

The 2nd byte of ***z*** = the 2nd byte of ***x*** BITWISE\_OR the 2nd byte of ***y***.

The 3rd byte of ***z*** = the 3rd byte of ***x*** BITWISE\_XOR the 3rd byte of ***y***.

The 4th byte of ***z*** = the complement of the 4th byte of ***x***.

(Hint: 0xff000000, 0xff0000, 0xff00, and 0xff are the numbers that have 8 bit 1s in the 1st byte, in the 2nd byte, in the 3rd byte, and in the 4th byte, with all other bit 0s. Bitwise AND operation with this mask values clear some part of a given number.)

1. (2 marks) Write a main function that tests the above function in (1). You should print some values to see if the function works correctly. These two functions including main() should be included in a file.

The following questions use

struct Student {

 char name[32];

 int number;

 float gpa;

}

1. (10 marks) Write a function that reads from the user the number of student records to read, reads student records, and returns the list of the student records. You should use dynamic memory allocation. (You do not have to use a linked list.)
2. (10 marks) We assume the file “student\_db” has ***n*** student records. Write a function that switches the *p*th record and *q*th record in the file. The ***filename***, ***p*** and ***q*** must be passed to this function.
3. (4 marks) Write a main function that tests the above two functions in (3) and (4). You should print some values to see if the functions work correctly. These three functions including main() should be included in a file.