

# CMPS 150 – Fall 2005

## Programming Assignment #8

2005.11.07

**Date Assigned:** Monday, November 7, 2005  
**Due Date:** 10:00 PM, Tuesday, November 15, 2005

**NOTE !!!!**

*pa8 is worth 3% of  
your overall grade*

The coded solution to the following problem is to be done by you and only you. You may ask for help from the class teaching assistants and the instructors, but you may not ask for C++ help from anyone else. You may use your notes, C++ texts, online tutorials, etc., but the code must be your own.

If you have a problem with your class account, compiling or debugging your code, or if you are not certain if you have submitted correctly, come see a TA or instructor as soon as possible.

1) **Include the following information as comments in the header of your source code:**

**Author:** *Your-Name*  
**CLID:** *Your-login-ID*  
**Class:** *CMPS 150 Section Your-Section-Number*  
**Assignment:** *pa8*  
**Date Assigned:** *Monday, November 7, 2005*  
**Due Date:** *10:00 PM, Tuesday, November 15, 2005*  
**Description:** *A brief description of the purpose of the program.*

**Certification of Authenticity:**

**I certify that this assignment is entirely my own work.**

2) **While in your class folder, enter the C++ code for the following description into a file named pa8.cc**

3) **Problem Description:**

This program will use the features of C++ that we have learned thus far in CMPS150, focusing on functions (both void and value-returning) and parameter passing (by value and by reference).

Your program is to be a menu-driven program, giving the user options of different types of processing of a file containing grade information. Your menu must have the following options on it:

1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

You must check that a valid menu selection has been given. If it is invalid, an error message should be displayed and the menu/input prompt repeated until valid data is given. The program must process each selection (except Quit) using a programmer-defined function. Main must have "minimal" code.

In designing your solution, one function prototype/definition is "up to you", and the others are prescribed by this program specification. See processing section for details.

**Processing**

Selection of option 1 or 2 must use the prototype given below. The input file must be open/checked in main, and the number of grades for the requested gender must be printed by main.

```
int NumGrades(ifstream&, char);
```

Selection of option 3 or 4 must use the prototype given below. The input file must be open/checked in main, and the average grade for the requested gender must be printed by main.

```
double AvgGrade(ifstream&, char);
```

Selection of option 5 must use the prototype below. The input file must be open/checked in the programmer-defined function, and the min/max must be printed by main.

```
void HighLow(int&, int&);
```

Selection of option 6 must use a programmer-defined function, but you may decide on the design of the function (void vs value-returning, choice of parameter(s)). The only output to the monitor for option #6 is to state the successful completion of the task. See sample run.

**Input Files**

Each option must allow the user to specify the name of the input and/or output file.

**Sample Input File**

*order of data:*  
**gender**  
**number of grades**  
**actual grades**

M	5	95	60	75	80	90		
F	2	90	80					
M	6	70	60	72	78	69	65	
M	3	85	80	82				
F	1	100						
F	4	90	80	70	60			
M	3	70	78	72				
F	4	50	60	42	68			
F	2	70	78					
M	3	50	40	55				

**Sample Run:**

1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 1  
 Enter name of input file: pa8.in  
 There are 20 grades for male students.

1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 2  
 Enter name of input file: pa8.in  
 There are 13 grades for female students.

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1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 3

Enter name of input file: pa8.in

The average grade for male students is: 71.3

1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 4

Enter name of input file: pa8.in

The average grade for female students is: 72.2

1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 5

Enter name of input file: pa8.in

The highest grade is: 100

The lowest grade is: 40

1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 6

Enter name of input file: pa8.in

Enter name of output file: pa8.out

\*\*\*\*\* Summary Output to "pa8.in" complete! \*\*\*\*\*

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1. Number of Grades for Male Students
2. Number of Grades for Female Students
3. Average Grade for Male Students
4. Average Grade for Female Students
5. Highest / Lowest Grade
6. Output Summary Information to a File
7. Quit

Choice: 7

Thanks -- and Bye !!

**Sample Output File**

```
Summary Information for Data File: pa8.out
-----
Total Number of Students: 10
      Total Male: 5
      Total Female: 5

Overall Average Grade: 71.64      (33 Total Grades)
  Average Male Grade: 71.30      (20 Total Male Grades)
  Average Female Grade: 72.15    (13 Total Female Grades)
```

**4) Additional Requirements:**

- Use comments as appropriate. Refer to “Programming Style Sheet” on the CMPS150 website.
- Your program must use good names for all variables and named constants. (Good names are names that are descriptive of the values stored or the function performed.)
- Adhere to style requirements. See “Programming Style Sheet” on the CMPS 150 web site.

**5) Name your source file 'pa8.cc' and store it in your class directory (cs150x).**

**6) Compile your program and test it (see Some Unix Help for quick assistance).**

To compile:

```
g++ -o pa8run pa8.cc
```

To run (execute):

```
pa8run
```

**7) After it is debugged and running correctly, submit pa8.cc (the source file only) electronically by 10:00 PM, Tuesday, November 15, 2005 to receive full credit.**

```
submit -d pa8.cc
```

The CLID for the TA of your section is the name to put in. This is one of the following:

**Section 3** You have a new TA – therefore a new submission CLID: **hmb7226**

<u>Section</u>	<u>TA</u>	<u>CLID of TA</u>
Section 3.....	Hollie .....	hmb7226
Section 4.....	Anca.....	axd9917
Section 5.....	Mitun .....	mxb2169
Section 6.....	Jason .....	jbm8240

You will be asked to enter the assignment name and the CLID of the person it is to go to. The assignment name is:

**assn8**

REMINDER: You can turn in programs up to 24 hours late for 75% credit, or up to 48 hours late for 50% credit.

**NOTE: Programs that do NOT compile will receive a grade of zero !!!**