University of Swaziland

Department of Computer Science

Final Main Examination: December 2017

Title of paper   : Computer programming II

Course Number: CSC213/CS244

Time Allowed: Three (3) hours

Instructions   :

1. Answer all questions. Each question carries 20 marks
2. This exam has pages from 1 to 4.
3. The Exam user_id, password, tree, context and server name will be provided by the chief invigilator.
4. Write pseudo codes and file specifications of all the files in the root of your network drive F:\ in your folder.
5. Submit folder, signed listings of printed programs and report files.
6. Use the last 10 minutes to check your submissions (pseudo codes, file specifications, signed listings of your programs and report files)
7. Read the complete question paper carefully before starting to work on the problem.
8. The names of all your files(project, source file and output files) should have following format

> S------(Project Name)
>
> S------.cpp (Program file)
>
> S------.TXT (data files)

The dashes in file names are six digits of your UNISWA student identity number.

Special requirements:

For each student

1. A networked PC with working C++ system.

2. An accessible secure network disk (F:\) & Printing facility

This paper may not be opened until permission has been granted by the invigilator

ANSWER FORMAT:
1. For each function, write (in your answer folder) a description of the input, output a detailed pseudocode.

2. For each function, write C++ code. Compile and test your code.

3. Provide sufficient comment in your source code.

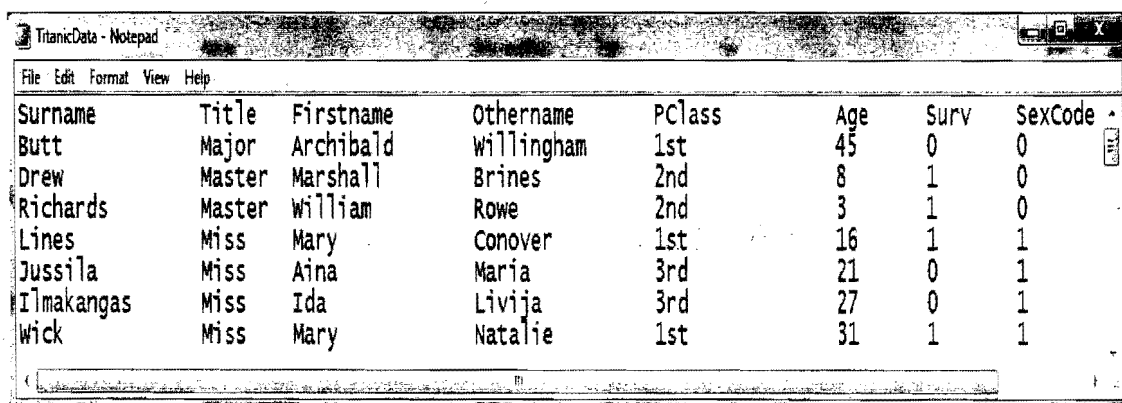4. Output from your program must be properly formatted.

MARKING SCHEME:
Each question will be marked using following scheme: Pseudo code (30 %), Results (20 %), Program (50 %)

PROBLEM:
The provided dataset (TitanicData.txt) contains information about some of the victims of the RMS Titanic sinking accident which occurred on the night of 14 April through to the morning of 15 April 1912 in the North Atlantic Ocean, four days into the ship's maiden voyage from Southampton to New York City. Her sinking, two hours and forty minutes into its voyage, resulted in the deaths of more than 1,500 people of its 2244 passengers.

Each passenger record in the data file (**TitanicData.txt**) contains the surname, title, first name, other name, travelling passenger class(PClass),   Age, an indicator of whether passenger survived or not(Surv: 1=survived; 0=not survived) and the sex code(SexCode: 1=female; 0=male). The figure below shows a sample (first few records/line) of the data.

TitanicData - Notepad								
File Edit Format View Help								
Surname	Title	Firstname	Othername	PClass		Age	Surv	SexCode
Butt	Major	Archibald	Willingham	1st		45	0	0
Drew	Master	Marshall	Brines	2nd		8	1	0
Richards	Master	William	Rowe	2nd		3	1	0
Lines	Miss	Mary	Conover	1st		16	1	1
Jussila	Miss	Aina	Maria	3rd		21	0	1
Ilmakangas	Miss	Ida	Livija	3rd		27	0	1
Wick	Miss	Mary	Natalie	1st		31	1	1

QUESTION 1:

Write C++ source code for a function whose parameters are the name of the data file and an integer survival indicator parameter that takes values 0 and 1. The function must display, on standard output, the name of all the passengers depending on the value of the survivor indicator parameter. For example if the indicator is 1, the function must display the details of all the passengers who survived. If the indicator is 0, the function must display the details of all the passengers who did not survived.

QUESTION 2:

Write C++ source code for a function whose parameters are the name of the data file and an integer gender indicator parameter that takes values 0 and 1. The function must display, on standard output, the name of all the passengers depending on the value of the gender indicator parameter. For example if the indicator is 1, the function must display the details of all the passengers who are female. If the indicator is 0, the function must display the details of all the passengers who are male.

QUESTION 3:

Write C++ source code for a function whose parameter is the name of the data file and displays, on standard output, the number of passengers in each of the following age groups: 0-5, 6-19, 20-40, 41+ (above 40).

QUESTION 4:

Write a C++ function whose parameters are the name of the input data file and the name of an output data file. The function reads data from the input file and write the passenger information to the output file in the following form: An example is shown in the first line.

Title	Surname	Initials	Age
Miss	Hays	M. B.	24
------	------	--------	-----
------	------	--------	-----
------	------	--------	-----

QUESTION 5:

Write a C++ program (main function) that implements a menu base command line interface (CLI). The program must repeatedly display the following menu until the exit option is chosen.

```
1.  Show passengers who survived
2.  Show passengers who did not survive
3.  Show Female passengers
4.  Show Male passengers
5.  Show Numbers in each age group
6.  Write to report a text file
7.  Exit

Enter your choice (1-7) :
```

- **Option 1** – uses the function developed in question 1 to display, on standard output, the details of the passengers who survived.

- **Option 2** – uses the function developed in question 1 to display, on standard output, the details of the passengers who did not survive.

- **Option 3** – uses the function developed in question 2 to display, on standard output, the details of the female passengers.

- **Option 4** – uses the function developed in question 2 to display , on standard output, the details of the male passengers

- **Option 5** – uses the function developed in question 3 to display, on standard output, the passenger numbers in each age group.

- **Option 6** – uses the function developed in question 4 to write the required details to an output file.

- **Option 7** - exits the program

END OF EXAMINATION