Assignment #3

Problem Solving and Programming in C++
Department of Computer Science
Old Dominion University

Objectives: The main objective of this assignment is to assess the student's ability to provide a complete Black-Box testing plan for a computer program.

Description: In this assignment, you will need to design a complete Black-Box testing plan for schools admission program. Assume that the school-board in your city wants to develop a computer program to automate the admission process for gifted students whom are exempted from taking the admission exam.

New gifted-students are accepted in a specific school based on a few factors, including the accumulated GPA (*i.e.*, GPA > 3.8) and the geographical location (*i.e.*, a student to be exempted from exam must live within a distance < 20 Miles from school). Students must apply to school(s) before the exemption deadline, which is June 15th at 10pm. for most schools in the Board. Some schools, like *Maury* and *Norview*, have extended deadline for the exemption till June 17th at 5:00pm. Each school exempts a limited number of the gifted-students from taking the admission test, and they cannot exceed these numbers. The maximum number of students each school can exempt from the admission test are:

School Name	Number students can be exempted from test	DeadlineDate	DeadlineTime
Booker T. Washington	30	06:15:2016	22:00:00
Granby	25	06:15:2016	22:00:00
Lake Taylor	20	06:15:2016	22:00:00
Maury	35	06:17:2016	17:00:00
Norview	25	06:17:2016	17:00:00
Princess Ann	35	06:15:2016	22:00:00

All other students must write the admission exam on July 5th, 2016 at 10:30:00am. Gifted students are given preference to join the school without writing the admission test as long they meet the minimum required GPA, apply before the school deadline, and spots are still available. If two or more gifted-students (*who met the required GPA*) are applying for the same school while only one spot still available, then the exemption decision will be made based on the geographical location – where the student who lives closer to the school will be given preference. Students with GPA = 4.00 are exempted from the geographical constraint. All admission requests should be made before the closing date/time for each school.

Task: You must design a complete Black-Box testing plan for the "*gifted student admission-text-exemption*" program. ***Your task*** is to apply what you have learned about black-box testing techniques to develop a full suite

of test data for this program. Use the template file provided in the Instructions and supporting files on BlackBoard to organize your tests and test data.

Hint: *Assume the data for this computer program is read as follow:*

- *Schools' information is read from a file (SchoolsInfo.txt)*
- *Each student will manually enter his/her information using the computer keyboard. A student's information will be represented by a record of 12 fields, as follow:*

LastName FirstName GPA ApplicationDate ApplicationTime DistFrom-BTW DistFrom-GR DistFrom-LT DistFrom-MU DistFrom-NV DistFrom-PA SchoolAppfor

*Where the "DistFrom-BTW" is the distance, measured in miles, between the student's house and Booker T. Washington high school. The "SchoolAppfor" is the name of school for which the student applies. The ApplicationDate and ApplicationTime are the **date** and **time** at which the student fills in his/her application.*

Examples:

Michel Johan 3.83 05:26:2016 10:35:23 19 17 05 32 18 08 Norview

Green Sarah 3.92 06:13:2016 17:08:13 13 09 08 14 15 12 Granby

The programs reads the student's information aIfgnd makes a decision based on the exemption criterion described above. Output of the program will be either:

- `LastName, FirstName is accepted at SchoolName and exempted from writing the admission test`

- `LastName, FirstName needs to write admission test on (MM:DD:YYYY) at (HH:MM:SS)`

Notes:

- If your computer has trouble opening the provided Gifted.exe file, make sure that the StudentsInfo.txt and SchoolsInfo.txt are in the same folder as the .exe file.
- If you still have trouble, try executing it in the ODU Virtual Computer Lab (VCLab). You can find information on how to connect to the VCLab on https://systems.cs.odu.edu/VCLab .
- Please note that the .exe file is not required to do this assignment and is only provided to give the students a better understanding of how the described program runs.

Submission notes:

- Submit a single file (***text***, ***MS word***, or ***pdf***). Name your file "Assg3_cslogin", where the cslogin is your login ID for the computers at the Department of Computer Science at ODU.

- Your file must include the following four sections with test data for each:

    1. Test data that covers representative inputs
    2. Test data that provides functional coverage
    3. Test data that provides for boundary-values testing
    4. Test data that implements special-values testing

- Submit your file in the respective Blackboard link.