



DPU EEE FINAL TAKE ON EXAM

Due: June 15th, 2020, until 20:00

1. (50p) Please write a Visual C++ program for the computations of the formula sets ①, ②, ③, ④ given below.

<p>① Resistors in Series</p> $R_{eq} = R_1 + R_2 + R_3 + \dots + R_n$ <p>② Resistors in Parallel</p> $\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_n}$ <p>Kirchhoff's Voltage Law Sum of all voltages in a loop is equal to zero.</p> $\sum \text{Voltages} = 0$ <p>Kirchhoff's Current Law Sum of all currents entering and leaving a node is equal to zero.</p> <p>Inductive Reactance</p> $X_L = 2\pi fL$ <p>X_L = Inductive reactance f = Frequency in hertz L = Inductance in henry</p>	<p>Capacitive Reactance</p> <p>③ $X_C = \frac{1}{2\pi fC}$</p> <p>X_C = Capacitive reactance f = Frequency C = Capacitance in Farads</p> <p>Ohm's Law for AC</p> <p>④ $E = IZ$</p> $I = \frac{E}{Z}$ $Z = \frac{E}{I}$ <p>E = Voltage I = Current in Ampere Z = Impedance in ohms</p> <p>Impedance in Series</p> $Z_{series} = Z_1 + Z_2 + Z_3$ <p>Impedance in Parallel</p> $Z_{parallel} = \frac{1}{\frac{1}{Z_1} + \frac{1}{Z_2} + \frac{1}{Z_3}}$	<p>Decibel Formulas</p> $A_{V(dB)} = 20 \log A_{V(ratio)}$ $A_{I(dB)} = 20 \log A_{I(ratio)}$ $A_{P(dB)} = 10 \log A_{P(ratio)}$ $A_{V(ratio)} = 10^{\frac{A_{V(dB)}}{20}}$ $A_{I(ratio)} = 10^{\frac{A_{I(dB)}}{20}}$ $A_{P(ratio)} = 10^{\frac{A_{P(dB)}}{10}}$ <p>True Power (P) $P = I^2 R$ $P = \frac{E^2}{R}$ Measure in watts</p> <p>Reactive Power (Q) $Q = I^2 X$ $Q = \frac{E^2}{X}$ Measure in Volt-Amps-Reactive</p> <p>Apparent Power (S) $S = I^2 Z$ $S = \frac{E^2}{Z}$ Measure in Volt-Amps</p>
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Below properties are certainly requested in the program* designed by you:

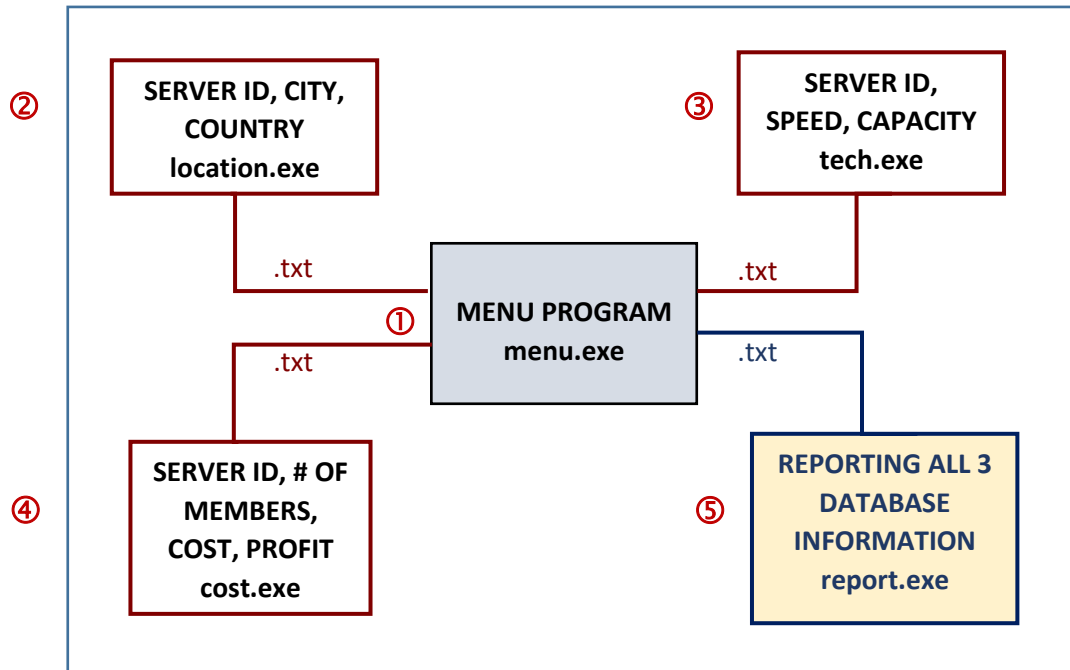
- i. Your program will be menu driven type. So you should use **switch-case-default** model.
- ii. Your program will have **#include <eee.h>** inclusion. So, you will design a header file with type definitions and member functions.
- iii. Your **eee.h** header file should have 4 **class** for each of 4 formula groups and their **member functions** for computations.

- iv. Notice that formula ① requires loops. You are free to choose **for**, **while**, **do-while** loop models.
- v. Notice that set ④ has 3 formulas

***Please pack .CPP file & .h file in .ZIP file, upload to eys.dpu.edu.tr and cplusplusproje@gmail.com**

[TR: Özetle; **switch-case-default** yapısı ile menü kontrollü bir program yazınız. Programda tablodaki 4 formül seti kodlanacak. Formüller **eee.h** isimli bir header dosyası içinde tasarlanacak. **eee.h** dosyasında her formül seti için 4 **class** oluşturulacak. Programınızın çalıştığını kontrol ettikten sonra, sadece **cpp** ve **h** dosyalarını **zip** formatında **eys.dpu.edu.tr** adresine yükleyiniz.]

2. (50p) Please write a package program including 5 executable (.exe) files managing 3 database text files (.txt) and 1 report text file (.txt) whose contents are given in the figure below:



The menu program (menu.exe) controls all other 4 executable (.exe) files. Each and every files are individual Visual C++ projects. There are 3 databases at 3 text (.txt) files including;

- ② Server locations
- ③ Server technical properties
- ④ Server cost and profits

⑤ The other text (.TXT) file is Servers' Report File which is an output file combining data from 3 data files of other modules.

Executable files will enable generating and reading related text (.txt) files. Fields in the data files (.txt) are shown in the graph above. Either **spawnl** or **execvp** commands can be used.

***Please pack your .CPP files in .ZIP file, upload to eys.dpu.edu.tr and cplusplus@gmail.com**

[TR: Özetle; veri taban yönetimi yapan bir paket program geliştirilecek. Paket programda 5 adet **exe** dosya yer alacak; 1 menü, 3 veri okuma/yazma işlemi yapan ve 1 raporlama programı. 3 veri dosyasındaki (.txt) alanlar grafikte yer almaktadır. Raporlama modülü ile 3 veri tabanından da yararlanarak çıktılar üretilebilecek. Her program ayrı bir Visual C++ projesi olacak ve **menu.exe** ile kontrol edilecek. **spawnl** veya **execvp** komutları kullanılabilir. 5 programa ait 5 **cpp** kod dosyasını **zip** olarak sıkıştırarak **eys.dpu.edu.tr**'ye yükleyiniz.]

If you have any questions, please, do not hesitate to ask.

Good luck!