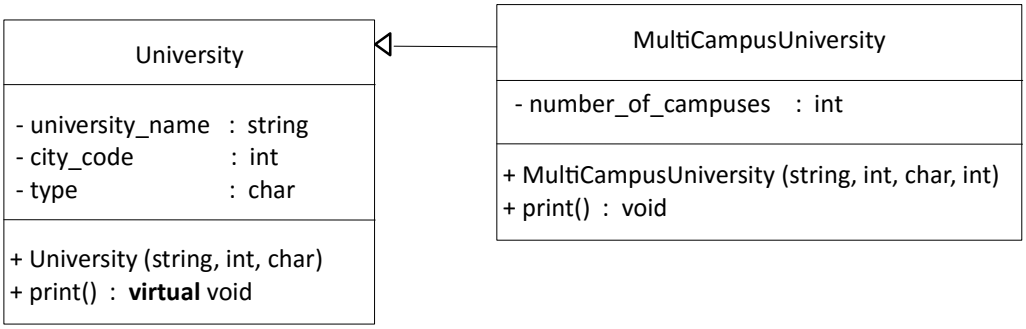
EHB354E - HOMEWORK2

Assignment Date : 9/5/2023
Due Date : 23/5/2023 at 23:59

- Student must do the homework without getting any help or collaboration.
- If significant similarities are found between submitted files, it will be considered as plagiarism, and those homework grades will be zero.
- File should be submitted to Ninova only, email submissions are not accepted.
- Your solution should be in one *.cpp file, without programmer-defined *.h header files.
- Program should work without compiler errors and give correct results as expected.

CLASSES

- Write C++ codes for the UML class and inheritance diagrams below. (+ is public, - is private)
- Parametered constructor functions initialize the member datas.
- The print functions display the member datas on screen.



MAIN PROGRAM

Write a C++ program to do followings.

- By looping and using C++ file input statements, read all records from the file named **"cities.txt"**. File contains city codes and names. Define a STL map (C++ Standard Template Library), and store all city datas read from file, into the map.
- Read all records from the file named **"universities.txt".** Fields in file are separated by semicolumn symbol (;) in the order given below.
  University Name ; City Code ; University Type ; Number of Campuses
  City Code field is integer.
  University Type field is one character (S : State, F : Foundation).
  Number of Campuses field exists only for MultiCampusUniversity category records.
  Your program should be general, so that it can work for any number of records in data files.
- Declare a STL vector of pointers (**polymorphic**) for the base class (University class). Dynamically allocate University objects and MultiCampusUniversity objects for datas read from the file, and store their pointers (memory addresses) in the vector.
- By using the vector and the map, generate the following screen output, printed by university categories.
- User should not enter any data inputs from keyboard, program reads datas from files and pass to class constructors.
- Use built-in setw function to obtain column alignments on screen output.
- Use built-in setlocale function to display Turkish texts on screen output.
- Use built-in char(254) function to display "■" symbol for histograms.

EXAMPLE SCREEN OUTPUT

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ONE-CAMPUS UNIVERSITIES :
    University Name                          City            Type
  1 AFYON KOCATEPE ÜNİVERSİTESİ              Afyonkarahisar  State
  2 AKSARAY ÜNİVERSİTESİ                     Aksaray         State
  3 AMASYA ÜNİVERSİTESİ                      Amasya          State
  4 BOĞAZİÇİ ÜNİVERSİTESİ                    İstanbul        State
  5 BOLU ABANT İZZET BAYSAL ÜNİVERSİTESİ     Bolu            State
  6 ÇANAKKALE ONSEKİZ MART ÜNİVERSİTESİ      Çanakkale       State
  7 ÇANKIRI KARATEKİN ÜNİVERSİTESİ           Çankırı         State
  8 ÇUKUROVA ÜNİVERSİTESİ                    Adana           State
  9 DOKUZ EYLÜL ÜNİVERSİTESİ                 İzmir           State
 10 ESKİŞEHİR OSMANGAZİ ÜNİVERSİTESİ         Eskişehir       State
 11 GALATASARAY ÜNİVERSİTESİ                 İstanbul        State
 12 GEBZE TEKNİK ÜNİVERSİTESİ                Kocaeli         State
 13 İNÖNÜ ÜNİVERSİTESİ                       Malatya         State
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 14 İZMİR KATİP ÇELEBİ ÜNİVERSİTESİ          İzmir           State
 15 İZMİR YÜKSEK TEKNOLOJİ ENSTİTÜSÜ          İzmir           State
 16 KARAMANOĞLU MEHMETBEY ÜNİVERSİTESİ       Karaman         State
 17 KIRKLARELİ ÜNİVERSİTESİ                  Kırklareli      State
 18 KOCAELİ ÜNİVERSİTESİ                     Kocaeli         State
 19 KÜTAHYA DUMLUPINAR ÜNİVERSİTESİ          Kütahya         State
 20 MANİSA CELAL BAYAR ÜNİVERSİTESİ          Manisa          State
 21 ORTA DOĞU TEKNİK ÜNİVERSİTESİ            Ankara          State
 22 PAMUKKALE ÜNİVERSİTESİ                   Denizli         State
 23 SAMSUN ÜNİVERSİTESİ                      Samsun          State
 24 SELÇUK ÜNİVERSİTESİ                      Konya           State
 25 SİNOP ÜNİVERSİTESİ                       Sinop           State
 26 SİVAS CUMHURİYET ÜNİVERSİTESİ            Sivas           State
 27 TEKİRDAĞ NAMIK KEMAL ÜNİVERSİTESİ        Tekirdağ        State
 28 TOKAT GAZİOSMANPAŞA ÜNİVERSİTESİ         Tokat           State
 29 TRABZON ÜNİVERSİTESİ                     Trabzon         State
 30 TRAKYA ÜNİVERSİTESİ                      Edirne          State
 31 UŞAK ÜNİVERSİTESİ                        Uşak            State
 32 VAN YÜZÜNCÜ YIL ÜNİVERSİTESİ             Van             State
 33 YALOVA ÜNİVERSİTESİ                      Yalova          State
 34 BEYKOZ ÜNİVERSİTESİ                      İstanbul        Foundation
 35 ÇANKAYA ÜNİVERSİTESİ                     Ankara          Foundation
 36 FENERBAHÇE ÜNİVERSİTESİ                  İstanbul        Foundation
 37 HALİÇ ÜNİVERSİTESİ                       İstanbul        Foundation
 38 IŞIK ÜNİVERSİTESİ                        İstanbul        Foundation
 39 İHSAN DOĞRAMACI BİLKENT ÜNİVERSİTESİ     Ankara          Foundation
 40 İSTANBUL ESENYURT ÜNİVERSİTESİ           İstanbul        Foundation
 41 İSTANBUL KENT ÜNİVERSİTESİ               İstanbul        Foundation
 42 İSTANBUL TİCARET ÜNİVERSİTESİ            İstanbul        Foundation
 43 İZMİR EKONOMİ ÜNİVERSİTESİ               İzmir           Foundation
 44 KADİR HAS ÜNİVERSİTESİ                   İstanbul        Foundation
 45 MALTEPE ÜNİVERSİTESİ                     İstanbul        Foundation
 46 SABANCI ÜNİVERSİTESİ                     İstanbul        Foundation
 47 SANKO ÜNİVERSİTESİ                       Gaziantep       Foundation
 48 TOBB EKONOMİ VE TEKNOLOJİ ÜNİVERSİTESİ   Ankara          Foundation
 49 DOĞU AKDENİZ ÜNİVERSİTESİ                KKTC            Foundation
 50 GİRNE ÜNİVERSİTESİ                       KKTC            Foundation
 51 LEFKE AVRUPA ÜNİVERSİTESİ                KKTC            Foundation
 52 ULUSLARARASI KIBRIS ÜNİVERSİTESİ         KKTC            Foundation


MULTI-CAMPUS UNIVERSITIES :
    University Name                          City            Type    Campuses
  1 AKDENİZ ÜNİVERSİTESİ                     Antalya         State      2
  2 ANADOLU ÜNİVERSİTESİ                     Eskişehir       State      2
  3 ANKARA ÜNİVERSİTESİ                      Ankara          State      3
  4 ATATÜRK ÜNİVERSİTESİ                     Erzurum         State      2
  5 BURSA ULUDAĞ ÜNİVERSİTESİ                Bursa           State      2
  6 EGE ÜNİVERSİTESİ                         İzmir           State      2
  7 ERCİYES ÜNİVERSİTESİ                     Kayseri         State      2
  8 GAZİ ÜNİVERSİTESİ                        Ankara          State      3
  9 HACETTEPE ÜNİVERSİTESİ                   Ankara          State      2
 10 İSTANBUL TEKNİK ÜNİVERSİTESİ             İstanbul        State      6
 11 İSTANBUL ÜNİVERSİTESİ                    İstanbul        State      3
 12 İSTANBUL ÜNİVERSİTESİ-CERRAHPAŞA         İstanbul        State      2
 13 KARADENİZ TEKNİK ÜNİVERSİTESİ            Trabzon         State      2
 14 MARMARA ÜNİVERSİTESİ                     İstanbul        State      3
 15 ONDOKUZ MAYIS ÜNİVERSİTESİ               Samsun          State      2
 16 SAKARYA ÜNİVERSİTESİ                     Sakarya         State      2
 17 YILDIZ TEKNİK ÜNİVERSİTESİ               İstanbul        State      2
 18 BAHÇEŞEHİR ÜNİVERSİTESİ                  İstanbul        Foundation 3
 19 BEYKENT ÜNİVERSİTESİ                     İstanbul        Foundation 2
 20 KOÇ ÜNİVERSİTESİ                         İstanbul        Foundation 2


HISTOGRAMS OF TOTAL UNIVERSITY NUMBERS:

ONE CAMPUS (STATE)        : 33 ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■
ONE CAMPUS (FOUNDATION)   : 19 ■■■■■■■■■■■■■■■■■■■
ONE CAMPUS TOTAL          : 52 ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■

MULTI CAMPUS (STATE)      : 17 ■■■■■■■■■■■■■■■■■
MULTI CAMPUS (FOUNDATION) : 3  ■■■
MULTI CAMPUS TOTAL        : 20 ■■■■■■■■■■■■■■■■■■■■

OVERALL TOTAL (STATE)     : 50 ■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■■
OVERALL TOTAL (FOUNDATION): 22 ■■■■■■■■■■■■■■■■■■■■■■

PROGRAM FINISHED.
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