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| **BAHRIA UNIVERSITY,** | | | |
| **(Karachi Campus)** | | | |
| *Department of Software Engineering* | | | |
| **ASSIGNMENT #: 1 – Fall 2022** | | | |
| COURSE TITLE: **System Programming** | | COURSE CODE: **CEN-449** | |
| Class: | **BSE - 5(B)** | Shift: | **Morning** |
| Course Instructor: **Engr. Rizwan Fazal** | | Date: | **11-Nov-2022** |
| Due Date: | **27-November-2022** | Max. Marks: | **10 Points** |

**Instructions:**

1. **This is a *Design and Implementation* project which will enable you to understand the System Software development using few important system aspects.**
2. **It is given as an individual task.**
3. **A project report needs to be submitted.**
4. **Attach the title page as given at page #. 3 of this document with completely filled information as required.**
5. **The given deadline is final and will not be extended in any case, therefore, it is highly recommended to start it as soon as possible. Strictly follow the instructions please!**

**Project Description:** [CLO-3]

In this project work, you have to consider the following design aspects:

* + Dynamic Memory Allocation
  + Pointers
  + Abstract Data Type (like Structures in C/C++)

You have to declare a *structure* with the name ‘Student’ which has the following information;

1. Name
2. Enrolment Number
3. Semester
4. CGPA

All the above parameters must be declared with an appropriate data type within a structure.

# Project Operation:

When we execute the program, the program should initially ask for the ‘Number of Students’ as an input from the user. Once it is provided, the program will dynamically allocate the required amount of memory to store the information for the given number of students. Pointers will be used to access the dynamically allocated memory. The following menu must be displayed on the screen for further actions

\*\*\* **Student Database System** \*\*\*

1. *Enter Student Information*
2. *Display Student Information*
3. *Edit Student Information*
4. *Delete Student Information*

The user should be able to do any of the above by pressing the corresponding ‘number’ on the screen. So, once the above menu is displayed on the screen, the program must wait for an input from the user to respond.

As the memory is allocated dynamically, so it is very important to release the acquired memory back to the system to avoid ‘Memory Leakage’.

The program also keeps track of the number of students whose information has been added in the record. For instance, if the user initially mentioned that there will be 50 students but provide the information for only 10 students at that time, so it must be known to the program itself to avoid overwriting.

There will be a bound check also in the program like if user enters ‘50’ in response to a message ‘Number of Students’, it shouldn’t go beyond that point which can possibly lead to application crash.

# Report

You have to submit the Assignment on the LMS which must include the following.

* 1. The title page as given here on the next page
  2. The source code (either in C or C++ languages), preferably with comments
  3. Screen shots of program execution of all the four options mentioned above
  4. Recommendations for improvement in the program in any way



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**ASSIGNMENT #. 1**

# Name: M Muaz Shahzad

**Enrolment #: 02-131202-081**

# Class: BSE-5B

**Software Engineering Department**

**Bahria University, Karachi Campus**

**CODE:**

#include<stdio.h>

#include<iostream>

#include<iomanip>

using namespace std;

struct Student{

string name;

string enrollmentNo;

string semester;

double cgpa;

};

int main(){

cout<<"\n\nEnter number of students: ";

int size;

cin>>size;

Student \*stu=new Student[size];

int x=0;

int t=0;

while(x==0){

cout<<"\n\n\n\t\t\t\t\*\*\*\*\*\*\*\*Student Database System\*\*\*\*\*\*\*\*\n"<<endl;

cout<<"1) Enter Student Information"<<endl;

cout<<"2) Display Student Information"<<endl;

cout<<"3) Edit Student Information"<<endl;

cout<<"4) Delete Student Information"<<endl;

cout<<"5) Exit"<<endl;

cout<<"Select:";

int s;

cin>>s;

if(s==1){

if(t<size){

cout<<"\n\nEntering Student "<<(t+1)<<endl;

cout<<"Enter name: ";

cin>>stu[t].name;

cout<<"Enter Enrollment: ";

cin>>stu[t].enrollmentNo;

cout<<"Enter Semester: ";

cin>>stu[t].semester;

cout<<"Enter CGPA: ";

cin>>stu[t].cgpa;

t++;

}

else{

cout<<"Memory is Full"<<endl;

}

}

else if(s==2){

cout<<"Enter Enrollment:"<<endl;

string enroll;

cin>>enroll;

int e=-1;

for(int i=0;i<=t;i++){

if(stu[i].enrollmentNo==enroll){

cout<<"\t\t\tStudent Data:"<<endl;

cout<<"\t\t\t============="<<endl;

cout<<"Name: "<<stu[i].name<<endl;

cout<<"Enrollment: "<<stu[i].enrollmentNo<<endl;

cout<<"Semester: "<<stu[i].semester<<endl;

cout<<"CGPA: "<<stu[i].cgpa<<endl;

}

else{

cout<<"No Record Found"<<endl;

}

}

}

else if(s==3){

cout<<"Enter Enrollment"<<endl;

string enroll;

cin>>enroll;

for(int i=0;i<=t;i++){

if(enroll==stu[i].enrollmentNo){

cout<<"\n\n\n\t\t\tUpdate Student Data:"<<endl;

cout<<"\t\t\t===================="<<endl;

cout<<"1) Name"<<endl;

cout<<"2) Enrollment"<<endl;

cout<<"3) Semester"<<endl;

cout<<"4) CGPA"<<endl;

cout<<"5) Exit"<<endl;

int u;

cin>>u;

if(u==1){

cout<<"Enter Name:"<<endl;

cin>>stu[i].name;

cout<<"Update Successfully\n\n"<<endl;

}

else if(u==2){

cout<<"Enter Enrollment:"<<endl;

cin>>stu[i].enrollmentNo;

cout<<"Update Successfully\n\n"<<endl;

}

else if(u==3){

cout<<"Enter Semester:"<<endl;

cin>>stu[i].semester;

cout<<"Update Successfully\n\n"<<endl;

}

else if(u==4){

cout<<"Enter CGPA:"<<endl;

cin>>stu[i].cgpa;

cout<<"Update Successfully\n\n"<<endl;

}

else if(u==5){

break;

}

}

else{

cout<<"No Record Found"<<endl;

}

cout<<"\t\t\tUpdated Student Data:"<<endl;

cout<<"\t\t\t====================="<<endl;

cout<<"Name: "<<stu[i].name<<endl;

cout<<"Enrollment: "<<stu[i].enrollmentNo<<endl;

cout<<"Semester: "<<stu[i].semester<<endl;

cout<<"CGPA: "<<stu[i].cgpa<<endl;

}

}

else if(s==4){

cout<<"Enter Enrollment"<<endl;

string en;

cin>>en;

int e=-1;

for(int i=0;i<=t;i++){

if(en==stu[i].enrollmentNo){

e=i;

break;

}

}

if(e!=-1){

cout<<"\n\nDeleted Successfully"<<endl;

t--;

}

else{

cout<<"No Record Found"<<endl;

}

}

else if(s==5){

delete [] stu;

break;

}

}

}

**SOLUTION:**

Text

Description automatically generated

Text

Description automatically generated



