PROBLEM STATEMENT:

Develop a program in C++ to create a database of student's information system containing the following information: Name, Roll number, Class, Division, Date of Birth, Blood group, Contact address, Telephone number, Driving license no. and other. Construct the database with suitable member functions. Make use of constructor, default constructor, copy constructor, destructor, static member functions, friend class, this pointer, inline code and dynamic memory allocation operators-new and delete as well as exception handling.

PROGRAM/SOURCE CODE:

```cpp
#include <iostream>

using namespace std;

class Student

{

public:

    static int counterStd;

    int localCounter = 0;

    int roll_number;

    long long telePhoneNumber, DrivingLicenseNumber;

    string name, std, division, DateOfBirth, BloodGroup, CtAddress;

    friend class Faculty;

    Student()

    {

        this->roll_number = 0;

        this->DrivingLicenseNumber = 0;

        this->telePhoneNumber = 0;

        this->name = "Student";

        this->std = "not filled";

        this->division = "not filled";

        this->DateOfBirth = "not filled";

        this->BloodGroup = "not filled";

        this->CtAddress = "not filled";

    }
```

```cpp
static int getCounter()

{

    return counterStd;

}


Student(int roll_number, long long number, long long DrivingLicenseNumber, string name, string
std, string division, string DateOfBirth, string BloodGroup, string CtAddress)

{

    this->roll_number = roll_number;

    this->telePhoneNumber = number;

    this->name = name;

    this->std = std;

    this->division = division;

    this->DateOfBirth = DateOfBirth;

    this->BloodGroup = BloodGroup;

    this->CtAddress = CtAddress;

    this->DrivingLicenseNumber = DrivingLicenseNumber;

}

Student(const Student& other) {

    this->roll_number = other.roll_number;

    this->telePhoneNumber = other.telePhoneNumber;

    this->DrivingLicenseNumber = other.DrivingLicenseNumber;

    this->name = other.name;

    this->std = other.std;

    this->division = other.division;

    this->DateOfBirth = other.DateOfBirth;

    this->BloodGroup = other.BloodGroup;

    this->CtAddress = other.CtAddress;

    this->localCounter = other.localCounter;

}
```

```cpp
~Student() { cout << "\nDestructor executed of class student"; }
void addStudent()
{
    cout << "Enter the roll number   of the student  to add  to the  list of students" << endl;
    cin >> this->roll_number;
    cout << "Enter the name of the student to add to the list of students " << endl;
    cin.ignore();
    getline(cin, this->name);
    cout << "Enter the year of studying the student " << endl;
    cin >> this->std;
    cout << "enter the division of the student " << endl;
    cin >> this->division;
    cout << "enter the date of the birth if the student " << endl;
    cin >> this->DateOfBirth;
    cout << "Enter the blood group of the student " << endl;
    cin >> this->BloodGroup;
    cout << "enter the telephone number of the student " << endl;
    cin >> this->telePhoneNumber;
    cout << "enter the address of the student " << endl;
    cin.ignore();
    getline(cin, this->CtAddress);
    cout << "enter the driving license number of student" << endl;
    cin >> this->DrivingLicenseNumber;
}
inline void displayData()
{
    cout << "---------------------------"
        << "this is record no " << this->localCounter << "-------------------------" << endl;
    cout << "---------------------------STUDENT INFORMATION-------------------------" << endl;
    cout << "-----------------------------------------------------------------------" << endl;
```

```cpp
        cout << "| ROLL NUMBER       : " << this->roll_number << endl;

        cout << "| NAME            : " << this->name << endl;

        cout << "| YEAR OF STUDY     : " << this->std << endl;

        cout << "| DIVISION          : " << this->division << endl;

        cout << "| DATE OF BIRTH     : " << this->DateOfBirth << endl;

        cout << "| BLOOD GROUP       : " << this->BloodGroup << endl;

        cout << "| TELEPHONE NUMBER   : " << this->telePhoneNumber << endl;

        cout << "| ADDRESS          : " << this->CtAddress << endl;

        cout << "| DRIVING LICENSE NO.: " << this->DrivingLicenseNumber << endl;

        cout << "----------------------------------------------------------------------" << endl;

        cout << "---------------------------STUDENT INFORMATION------------------------" << endl;

        cout << "----------------------------------------------------------------------" << endl;

        cout << endl;
    }
};
int Student::counterStd = 0;


class Faculty
{
public:
    void showDataFacWise(string divChoise, Student &student)
    {
        if (student.division == divChoise)
        {
            student.displayData();
        }
    }
};
int main()
{
```

```cpp
int counter = 0;

Student *student = new Student[10];

int choise;


while (1)

{

    cout << "---------------------------------------------------------------" << endl;

    cout << "--------            -ENTER YOUR CHOICE           --------" << endl;

    cout << "---------------------------------------------------------------" << endl;

    cout << "1) ADD STUDENT\n2) DISPLAY STUDENT LIST\n 3)DISPLAY FACULTY WISE LIST\n4) EXIT";

    cout << "---------------------------------------------------------------" << endl;

    cout << "--------            WELCOME TO STUDENT DATABASE      --------" << endl;

    cout << "---------------------------------------------------------------" << endl;

    try

    {

        cin >> choise;

        if (choise > 4)

        {

            throw std::runtime_error("Choise must be selected from options given above not greater than 4...");

        }

    }

    catch (const std::exception &e)

    {

        // Catch and handle the exception

        std::cerr << "Exception caught: " << e.what() << std::endl;

    }


    string divChoise;

    switch (choise)
```

```cpp
{
case 1:

    cout << "you have selected option 1" << endl;

    student[counter].addStudent();

    Student::counterStd++;

    student[counter].localCounter = Student::counterStd;

    counter++;

    break;
case 2:

    cout << "you have selected option 2" << endl;

    for (int i = 0; i < counter; i++)

    {

        student[i].displayData();

    }

    break;
case 3:

    // string divChoise;

    cout << "you have selected option 3" << endl;

    Faculty f;

    cout << "As you are accessing data as an faculty which division data you want to access" <<
endl;

    cin >> divChoise;

    for (int i = 0; i < counter; i++)

    {

        f.showDataFacWise(divChoise, student[i]);

    }

    break;


case 4:

    cout << "you have selected to exit Student database system" << endl;

    cout << "exiting........ " << endl;
```

```
        delete[] student;

            break;

        }

        if (choise == 4)

        {

            break;

        }

    }


    return 0;

}
```

OUTPUT:

```
1) ADD STUDENT
2) DISPLAY STUDENT LIST
 3)DISPLAY FACULTY WISE LIST
4) EXIT-----------------------------------------------------------
--------              WELCOME TO STUDENT DATABASE        --------
-----------------------------------------------------------
1
you have selected option 1
Enter the roll number   of the student  to add  to the  list of students
21076
Enter the name of the student to add to the list of students
sahil suhas sadekar
Enter the year of studying the student
2023
enter the division of the student
A
enter the date of the birth if the student
28-03-2005
Enter the blood group of the student
A-
enter the telephone number of the student
9850109384
enter the address of the student
shivaji nagar pune
enter the driving license number of student
33443344
----------------------------------------------------------------
--------               -ENTER YOUR CHOICE               --------
----------------------------------------------------------------
1) ADD STUDENT
2) DISPLAY STUDENT LIST
 3)DISPLAY FACULTY WISE LIST
4) EXIT----------------------------------------------------------
--------              WELCOME TO STUDENT DATABASE        --------
```

```
                              -ENTER YOUR CHOICE
---------------------------------------------------------------
1) ADD STUDENT
2) DISPLAY STUDENT LIST
 3)DISPLAY FACULTY WISE LIST
4) EXIT---------------------------------------------------------
--------           WELCOME TO STUDENT DATABASE        --------
---------------------------------------------------------------
2
you have selected option 2
-------------------------this is record no 1-----------------------
-------------------------STUDENT INFORMATION-----------------------
---------------------------------------------------------------
| ROLL NUMBER        : 21076
| NAME               : sahil suhas sadekar
| YEAR OF STUDY      : 2023
| DIVISION           : A
| DATE OF BIRTH      : 28-03-2005
| BLOOD GROUP        : A-
| TELEPHONE NUMBER   : 9850109384
| ADDRESS            : shivaji nagar pune
| DRIVING LICENSE NO.: 33443344
---------------------------------------------------------------
-------------------------STUDENT INFORMATION-----------------------
---------------------------------------------------------------


---------------------------------------------------------------
--------              -ENTER YOUR CHOICE           --------
---------------------------------------------------------------
1) ADD STUDENT
2) DISPLAY STUDENT LIST
 3)DISPLAY FACULTY WISE LIST
4) EXIT-------------------------------------------------------
--------           WELCOME TO STUDENT DATABASE        --------
---------------------------------------------------------------
```

```
4) EXIT---------------------------------------------------------
--------           WELCOME TO STUDENT DATABASE        --------
---------------------------------------------------------------
1
you have selected option 1
Enter the roll number   of the student  to add  to the  list of students
21077
Enter the name of the student to add to the list of students
pranav shinde
Enter the year of studying the student
2023
enter the division of the student
A
enter the date of the birth if the student
23-5-2004
Enter the blood group of the student
O+
enter the telephone number of the student
9877347834
enter the address of the student
katraj pune
enter the driving license number of student
834634874
---------------------------------------------------------------
--------              -ENTER YOUR CHOICE           --------
---------------------------------------------------------------
1) ADD STUDENT
2) DISPLAY STUDENT LIST
 3)DISPLAY FACULTY WISE LIST
4) EXIT-------------------------------------------------------
--------           WELCOME TO STUDENT DATABASE        --------
```

```
-----------------------------------------------------------
1
you have selected option 1
Enter the roll number  of the student  to add  to the  list of students
3456
Enter the name of the student to add to the list of students
rohit
Enter the year of studying the student
2023
enter the division of the student
B
enter the date of the birth if the student
30-2-2002
Enter the blood group of the student
A+
enter the telephone number of the student
98343434
enter the address of the student
in mumbai
enter the driving license number of student
3343434
-----------------------------------------------------------
--------              -ENTER YOUR CHOICE           --------
-----------------------------------------------------------
```

```
2
you have selected option 2
--------------------------this is record no 1-----------------------
--------------------------STUDENT INFORMATION-----------------------
-------------------------------------------------------------------
| ROLL NUMBER        : 21076
| NAME               : sahil suhas sadekar
| YEAR OF STUDY      : 2023
| DIVISION           : A
| DATE OF BIRTH      : 28-03-2005
| BLOOD GROUP        : A-
| TELEPHONE NUMBER   : 9850109384
| ADDRESS            : shivaji nagar pune
| DRIVING LICENSE NO.: 33443344
-------------------------------------------------------------------
--------------------------STUDENT INFORMATION-----------------------
-------------------------------------------------------------------

--------------------------this is record no 2-----------------------
--------------------------STUDENT INFORMATION-----------------------
-------------------------------------------------------------------
| ROLL NUMBER        : 21077
| NAME               : pranav shinde
| YEAR OF STUDY      : 2023
| DIVISION           : A
| DATE OF BIRTH      : 23-5-2004
| BLOOD GROUP        : O+
| TELEPHONE NUMBER   : 9877347834
| ADDRESS            : katraj pune
| DRIVING LICENSE NO.: 834634874
-------------------------------------------------------------------
--------------------------STUDENT INFORMATION-----------------------
-------------------------------------------------------------------
```

OOP LAB ASSIGNMENTS(PRACTICALS)

```
--------------------------------------------------------
3
you have selected option 3
As you are accessing data as an faculty which division data you want to access
B
--------------------------this is record no 3------------------------
----------------------------STUDENT INFORMATION-----------------------
--------------------------------------------------------------------
| ROLL NUMBER         : 3456
| NAME                : rohit
| YEAR OF STUDY       : 2023
| DIVISION            : B
| DATE OF BIRTH       : 30-2-2002
| BLOOD GROUP         : A+
| TELEPHONE NUMBER    : 98343434
| ADDRESS             : in mumbai
| DRIVING LICENSE NO.: 3343434
--------------------------------------------------------------------
----------------------------STUDENT INFORMATION-----------------------
--------------------------------------------------------------------


-----------------------------------------------------------
--------                -ENTER YOUR CHOICE             --------
-----------------------------------------------------------
1) ADD STUDENT
2) DISPLAY STUDENT LIST
 3)DISPLAY FACULTY WISE LIST
4) EXIT----------------------------------------------------
--------                WELCOME TO STUDENT DATABASE    --------
-----------------------------------------------------------
```