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* Assignment - 1 *

2. Write a CPP program to create a data store for books. The data members will be book id, book name, book author, isbn, publish date. Accept and print the data in a well formatted manner.

```
*Code:- #include <iostream>
#include <string.h>
using namespace std;

class book
{
private:
    string book_id;
    string book_name;
    string book_author;
    int isbn;
    string dob;

public:
    void set_data()
    {
        cout << "Enter Book ID" << endl;
        cin >> this->book_id;
        cout << "Enter Book Name" << endl;
        cin >> this->book_name;
        cout << "Enter Book Author" << endl;
        cin >> this->book_author;
        cout << "Enter ISBN" << endl;
        cin >> std::ws;
        cin >> this->isbn;
        cout << "Enter Date of Publication" << endl;
        cin >> std::ws;
        cin >> this->dob;
    }

    void show_data()
    {
        cout << "Book ID is:" << this->book_id << endl;
    }
}
```

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```
cout << " Book Num is : " << this->book_name << endl;
cout << " Book Author is : " << this->book_author << endl;
cout << " Book ISBN is : " << this->isbn << endl;
cout << " Book Date of Publish is : " << this->dob << endl;
}
};

int main()
{
    book b1;
    b1.set_data();
    b1.show_data();
    return 0;
}
```

* Output:-
Enter Book ID : 1020
Enter Book Name : Learn C++
Enter Book Author: Biproni Sengupta
Enter ISBN: 56AB70
Enter Date of Publication: 21/02/2023



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* Assignment-2 *

- Q:- Create a class mobile phone accept data for n numbers of mobile and display the same in the well formatted manner.

```
* Code :- #include <iostream>
using namespace std;
class mobilePhone
{
private:
    int number;
public:
    void set-data();
    void show-data();
};

void mobilePhone :: set-data()
{
    cout << " Please Enter Mobile Phone Number: " << endl;
    cin >> this-> number;
}

void mobilePhone :: show-data()
{
    cout << this-> number << endl;
}

int main()
{
    int n;
    cout << " Enter how many mobile phone numbers you want to
store. " << endl;

    cin >> n;
    mobilePhone mb[n];
    for (int i=0; i<n; i++)
    {
        mb[i].set-data();
    }
}
```

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```
Cout << "List of all Mobile Number is : " << endl;
for (int i=0 ; i<n ; i++)
{
    mp[i].show_data();
}
return 0;
}
```

* Output:- Enter how many mobile phone numbers you want to store.

3

Please Enter Mobile Phone Number:

9684001243

Please Enter Mobile Phone Number:

9876543210

Please Enter Mobile Phone Number:

8821403175

List of all Mobile Number is :

9684001243

9876543210

8821403175



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* Assignment-3 *

3:- Create a class Event accept the event detail and print the event ticket for the participant Also enter some pre-defined data like name of college, branch data etc.

*Code:-

```
#include <iostream>
#include <string.h>
using namespace std;

class event
{
private:
    string Event_name = "Aayam", Event_date = "28-01-2023", fname,
    lname, id, branch = "MCA", college_name = "NIT AGARTALA";
public:
    void set_data();
    void show_data();
};

void event::set_data()
{
    cout << "Enter First Name:" << endl;
    cin >> this->fname;
    cout << "Enter Last Name:" << endl;
    cin >> this->lname;
    cout << "Enter ID:" << endl;
    cin >> this->id;
}

void event::show_data()
{
    cout << "----- Event Ticket for " << this->Event_name <<
    " ----- " << endl;
    cout << " ---> Event Date is: " << this->Event_date << endl;
    cout << " ---> Your First Name is: " << this->fname << endl;
```

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```
Cout << " ---> Your Last Name is : " << this->lname << endl ;  
Cout << " ---> Your ID is : " << this->id << endl ;  
Cout << " ---> Your Branch is : " << this->branch << endl ;  
Cout << " ---> Your College Name is : << this->college_name << endl ;  
Cout << " -----x----- " << endl ;  
};  
int main ( )  
{  
    event e;  
    e.set_data ( );  
    e.show_data ( );  
    return 0;  
}
```

* Output:- Enter First Name :
Ashutosh
Enter Last Name :
Singh
Enter ID :
564

----- Event Ticket for Aayam -----
---> Event Date is : 28-01-2023
---> Your First Name is : Ashutosh
---> Your Last Name is : Singh
---> Your ID is : 564
---> Your Branch is : MCA
---> Your College Name is : NIT AGARTALA
-----x-----



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* Assignment - 4 *

Q:- Write a Program with necessary number function and data member to prove that a default constructor gets executed even though no explicit constructor is declared.

* Code :-

```
#include <iostream>
using namespace std;

class myClass
{
public:
    myClass()
    {
        cout << "Default Constructor Called" << endl;
    }
};

int main()
{
    myClass ob;
    return 0;
}
```

* Output :-

Default Constructor Called.

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* Assignment - 5 *

S:

Write a program to enter 10 words and a string of three long sentences, implement a function to calculate the number of words present in the given string and remaining words, use a map function to display matched word with frequency of occurrences of remaining words in the string.

* Code:-

```
#include <iostream>
#include <regex>
#include <string>
using namespace std;

class Counter
{
private:
    string str;
    vector<string> wordsToBeMatched {"is", "are", "am", "to", "that",
                                    "this", "not", "for", "in", "but"};
    void countOccurrences (string str, string word)
    {
        string regexPattern = "\b" + word + "\b";
        const regex pattern (regexPattern);
        smatch match;
        int count = 0;
        while (regex_search (str, match, pattern))
        {
            count++;
            str = match.suffix () . str ();
        }
        cout << "Number of Occurrences of word" << word << "is" <<
        "times." << endl;
    }

public:
    void quick ()
    {
        cout << "Enter a string: ";
        getline (cin, str);
        for (auto element : wordsToBeMatched)
```

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```
{  
    countOccurrences (&s, element);  
}  
  
{  
    int main ()  
{  
    counterC ;  
    C.quickC ();  
    return 0;  
}
```

* Output:- Enter a String: this is code to find occurrences, tea is hot and that is a cow, this is not a boy

Number of Occurrences of word 'is' is 4 times.

Number of Occurrences of word 'are' is 0 times.

Number of Occurrences of word 'am' is 0 times.

Number of Occurrences of word 'to' is 1 times.

Number of Occurrences of word 'that' is 1 times.

Number of Occurrences of word 'this' is 2 times.

Number of Occurrences of word 'not' is 1 times.

Number of Occurrences of word 'for' is 0 times.

Number of Occurrences of word 'in' is 0 times.

Number of Occurrences of word 'hot' is 0 times.

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* Assignment - 6 *

Using an array of objects, implement the assignment program for multiple strings.

*

Code:

```
#include <iostream>
#include <regex>
#include <string>
using namespace std;
```

class Counter

{

private:

String str;

vector<String> wordsToBeMatched { "is", "are", "am", "to", "that", "the", "not", "for", "in", "not" };

void countOccurrences (String str, String word)

{

String regexPattern = "\b" + word + "\b";

const regex pattern(regexPattern);

smatch match;

int count = 0;

while (regex_search(str, match, pattern))

{

count++;

str = match.suffix().str();

}

cout << "Number of occurrence of word " << word << endl;

" << count << " times. " << endl;

}

public:

void fetch (int i)

{ cout << "Enter string no " << i+1 << endl;

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```

getline ( cin, str );
for ( auto element : wordsToBeMatched )
{
    CountOccurrences ( str, element );
}
}
}

int main()
{
    cout << " Enter No of strings " << endl;
    int noOfStrings;
    cin >> noOfStrings;
    std::cin.ignore ( std::numeric_limits<std::streamsize>::max(), '\n' );
    Counter c [noOfStrings];
    for ( int i = 0 ; i < noOfStrings ; i++ )
    {
        c[i].fetch(i);
    }
    return 0;
}

```

*Output:

Enter No of strings

2

Enter string no1

this is a program to find string in array

Number of Occurrences of word 'is' is 1 times.

Number of Occurrences of word 'are' is 0 times.

Number of Occurrences of word 'am' is 0 times.

Number of Occurrences of word 'to' is 1 times.

Number of Occurrences of word 'that' is 0 times.

Number of Occurrences of words 'this' is 1 times.

Number of Occurrences of words 'not' is 0 times.

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Number of Occurrences of word 'for' is 0 times.

Number of Occurrences of word 'in' is 1 times.

Number of Occurrences of word 'not' is 0 times.

Enter String no 2

It is not a simple program.

Number of Occurrences of word 'is' is 1 times.

Number of Occurrences of word 'are' is 0 times.

Number of Occurrences of word 'am' is 0 times.

Number of Occurrences of word 'to' is 0 times.

Number of Occurrences of word 'that' is 0 times.

Number of Occurrences of word 'this' is 0 times.

Number of Occurrences of word 'not' is 1 times.

Number of Occurrences of word 'for' is 0 times.

Number of Occurrences of word 'in' is 0 times.

Number of Occurrences of word 'not' is 1 times.



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* Assignment - 7 *

- = Create a class mark which contains the marks of five students use constructor is necessary.

* Code :-

```
#include <iostream>
using namespace std;
class mark
{
private:
    int marks;
public:
    mark (int marks)
    {
        this->marks = marks;
    }
    void show_data();
};
void mark :: show_data()
{
    cout << this->marks << endl;
}
int main()
{
    mark m1(10), m2(20), m3(30), m4(40), m5(50);
    m1.show_data();
    m2.show_data();
    m3.show_data();
    m4.show_data();
    m5.show_data();
}
```

* Output:-

10
20
30
40
50

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* Assignment - 8 *

Q. Write a Program to illustrate working of object constructors and class.

* Code:-

```
#include <iostream>
using namespace std;

class Semb // this is class
{
public:
    Semb() // this is constructor.
{
    cout << " Constructor called : " << endl;
}
};

int main()
{
    Semb s; // this is object.
    return 0;
}
```

* Output:

Constructor called :

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* Assignment - 9 *

- Q- Write a Program to demonstrate the use of an inline function in a class.
A class will collect the details of a student and display.

* Code:-

```
#include <iostream>
#include <string>
using namespace std;
```

```
class Student
```

```
{
```

```
private:
```

```
String name;
```

```
int age;
```

```
String rollNo;
```

```
String dob;
```

```
String course;
```

```
public:
```

```
inline void setData (String name, int age, String rollNo, String dob, String course);
```

```
{
```

```
this->name = name;
```

```
this->age = age;
```

```
this->rollNo = rollNo;
```

```
this->dob = dob;
```

```
this->course = course;
```

```
}
```

```
inline void display ()
```

```
{
```

```
cout << " Name of Student is : " << this->name << endl;
```

```
cout << " Age of Student is : " << this->age << endl;
```

```
cout << " Roll Number of Student is : " << this->rollNo << endl;
```

```
cout << " Date of Birth of Student is : " << this->dob << endl;
```

```
cout << " Course of Student is : " << this->course << endl;
```

```
} ;
```



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```
int main ()
{
    Student st;
    st.setData ("Ashutosh Singh", 19, "22MCA016", "24-08-2003", "MCA");
    st.display();
    return 0;
}
```

*Output:

Name of Student is : Ashutosh Singh

Age of Student is : 19

Roll Number of Student is : 22MCA016

Date of Birth of Student is : 24-08-2003

Course of Student is : MCA

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* Assignment - 10 *

10.

Create a class credit card to collect the following data.

Issuer_Bank, card_Holder name, expiry_from and expiry_to, card_number, CVV, card type, credit limit and credit score.

Implement the following concepts constructor, default constructor, member function, inline function, destructor and polymorphism.

Issue a new card to a new person based on the credit score and overall income.

Assign the credit limit based on the given table.

*

Code:

```
#include <iostream>
```

```
#include <string>
```

```
class CreditCard
```

```
{
```

```
private:
```

```
std::string issuerBank_;
```

```
std::string cardHolderName_;
```

```
std::string expiryFrom_;
```

```
std::string expiryTo_;
```

```
std::string cardNumber_;
```

```
int CVV_;
```

```
std::string CardType_;
```

```
double creditLimit_;
```

```
int creditScore_;
```

```
public:
```

```
CreditCard (const std::string & issuerBank, const std::string & cardHolderName, const std::string & expiryFrom, const std::string & expiryTo, const std::string & cardNumber, int CVV, const std::string & CardType, double creditLimit, int creditScore)
```



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: issuerBank_ (issuerBank), cardHolderName_ (cardHolderName), expiryFrom_ (expiryFrom), expiryTo_ (expiryTo), cardNumber_ (cardNumber), CVV_ (CVV), cardType_ (cardType), creditLimit_ (creditLimit), creditScore_ (creditScore) { }

CreditCard ()

: CreditCard ("", "", "", "", "", 0, "", 0, 0) { }

std::string getIssuerBank() const { return issuerBank; }

void setIssuerBank (const std::string & issuerBank) { issuerBank = issuerBank; }

std::string getCardHolderName() const { return cardHolderName; }

void setCardHolderName (const std::string & cardHolderName) { cardHolderName = cardHolderName; }

std::string getExpiryFrom() const { return expiryFrom; }

void setExpiryFrom (const std::string & expiryFrom) { expiryFrom = expiryFrom; }

std::string getExpiryTo() const { return expiryTo; }

void setExpiryTo (const std::string & expiryTo) { expiryTo = expiryTo; }

std::string getCardNumber() const { return cardNumber; }

void setCardNumber (const std::string & cardNumber) { cardNumber = cardNumber; }

int getCVV() const { return CVV; }

void setCVV (int CVV) { CVV = CVV; }

std::string getCardType() const { return cardType; }

void setCardType (const std::string & cardType) { cardType = cardType; }

double getCreditLimit() const { return creditLimit; }

void setCreditLimit (double creditLimit) { creditLimit = creditLimit; }

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```
int getCreditScore () const { return creditScore; }  
void setCreditScore (int creditScore) {  
    creditScore = creditScore; }
```

```
~ CreditCard ()  
{  
}  
};  
};
```

```
int double calculateCreditLimit (int creditScore)  
{  
    if (creditScore >= 800)  
    {  
        return 50000;  
    }  
    else if (creditScore >= 750)  
    {  
        return 25000;  
    }  
    else if (creditScore >= 700)  
    {  
        return 10000;  
    }  
    else  
    {  
        return 5000;  
    }  
}
```

```
void issueCreditCard (const std::string & issuerBank, const std::string  
& cardHolderName, const std::string & expiry  
From, const std::string & expiryTo,  
const std::string & cardNumber, int CVV,  
const std::string & cardType, int credit  
Score, double overallIncome )  
{  
    double creditLimit = calculateCreditLimit (creditScore);
```

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if (overallIncome >= 50000)

{
 creditLimit = 2;
}

CreditCard * card = new CreditCard (issuerBank, cardHolderName, expiryFrom, expiryTo, cardNumber, CVV, cardType, creditLimit, creditScore);

std::cout << "Credit Card issued : " << cardHolderName << ",
creditLimit : " << creditLimit << std::endl;

}

int main ()

{

issueCreditCard ("Chase", "John Smith", "01/22", "01/25", "1234
5678 9012 3456 123", "Visa", 780, 60000);

issueCreditCard ("Bank of America", "Jane Doe", "03/23", "03/26",
"9876 5432 1098 7654", 456, "Mastercard", 680
30000);

return 0;

}

*Output:

Credit Card issued : John Smith, creditLimit = 2

Credit Card issued : Jane Doe, creditLimit = 5000



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* Assignment - 11 *

11. Write a Program to show access to private, public and protected using inheritance.

*

Code:

```
#include <iostream>
using namespace std;
```

Class Base
{

private :

```
int privateVar;
```

protected :

```
int protectedVar;
```

public :

```
int publicVar;
```

}

Class Private Derived : private Base

{

public :

void display()

{

cout << "***** * * * * " << endl;

cout << " * I am the Display function of Privately Derived class
and i can inherit Public and Protected variables both
as Private from Base class. " << endl;

cout << " * publicVar is : " << this->publicVar << endl;

Cout << " * protectedVar is : " << this->protectedVar << endl;

Cout << " * * * * * * * * * " << endl;

}

};

Class Protected Derived : protected Base

{

public :

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```
void display ()  
{  
    cout << "***** * * * * " << endl;  
    cout << "* I am the Display function of Protectedly Derived class and  
        i can inherit Public and Protected variables both as Protected  
        from Base Class." << endl;  
    cout << "* publicVar is : " << this->publicVar << endl;  
    cout << "* protectedVar is : " << this->protectedVar << endl;  
    cout << "***** * * * * " << endl;  
}  
};  
  
Class PublicDerived : public Base  
{  
public:  
    void display ()  
{  
        cout << "***** * * * * " << endl;  
        cout << "* I am the Display function of Publically Derived class and i  
            can inherit Public and Protected variables as Public and Protected  
            respectively from Base class." << endl;  
        cout << "* publicVar is : " << this->publicVar << endl;  
        cout << "* protectedVar is : " << this->protectedVar << endl;  
        cout << "***** * * * * " << endl;  
    }  
};  
  
int main ()  
{  
    Base b ;  
    PublicDerived pubD ;  
    ProtectedDerived protD ;  
    PrivateDerived privD ;  
    b.publicVar = 50 ;  
    pubD.display () ;
```

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```
b1ivD.display();  
b2oD.display();  
return 0;  
}
```

Output:-

* publicVar is : -2
* protectedVar is : 423300572
* I am the Display function of Privately Derived class and
i can inherit Public and Protected variables both as Private
from Base class.

* I am Display function of Protectedly Derived class and i can
inherit Public and Protected variables both as Protected from
Base class .

* publicVar is : 4800928

* protectedVar is : 1981578653



* Assignment - 12 *

Q. C++ Program to Overriding the member function using inheritance.

* Code:

```
#include <iostream>
using namespace std;
```

```
class Animal
{
```

```
public:
```

```
virtual void makeSound ()
```

```
{
```

```
cout << "General Animal Sound" << endl;
```

```
}
```

```
};
```

```
class Dog : public Animal
```

```
{
```

```
public:
```

```
void makeSound ()
```

```
{
```

```
cout << "Barking...." << endl;
```

```
}
```

```
};
```

```
int main ()
```

```
{
```

```
Animal *animal = new Dog();
```

```
animal-> makeSound ();
```

```
return 0;
```

```
}
```

* Output:-

Barking....

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* Assignment - 13 *

13. C++ Program to find Area and volume using multiple inheritance.

*

Code:

```
#include <iostream>
using namespace std;

class TotalSurfaceArea
{
public:
    void tsaa (int side)
    {
        cout << " Total Surface Area is : " << 6 * side * side << endl;
    }
};

class Volume
{
public:
    void volume (int side)
    {
        cout << " Volume is : " << side * side * side << endl;
    }
};

class Cube : public TotalSurfaceArea, Volume
{
private:
    int side;
public:
    Cube (int side)
    {
        this->side = side;
    }
};
```

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```
void calculate()
{
    ts(a(side));
    volume(side);
}
int main()
{
    Cube c(5);
    c.calculate();
    return 0;
}
```

* Output:

Total Surface Area is : 150
Volume is : 125



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* Assignment - 14 *

- Q4. C++ Program to illustrates the use of Constructors in Multiple inheritance

* | Code :-

```
#include <iostream>
using namespace std;
```

Class Base 1

```
int base1;
```

public:

Base1 (int base1)

۵

```
cout << " constructor of Base1 class called. " << endl;
```

this->base1 = base1;

乙

三

Class Base2

5

int base2 ;

public:

Base2 (int base2)

4

```
cout << "Constructor of Base2 class called." << endl;
```

this->.base2 = base2 ;

2

3

Class Derived: public Base1, Base2

۲

int derived ;

public :

```
public:  
    Derived (int base1, int base2, int derived) : Base1 (base1),  
        Base2 (base2)
```

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```
{  
    cout << " Constructor of Derived class called. " << endl;  
    this-> derived = derived;  
}
```

```
{  
};
```

```
int main()  
{
```

```
    Derived derived(1,2,3);
```

```
    return 0;  
}
```

* Output:

```
Constructor of Base1 class called.  
Constructor of Base2 class called.  
Constructor of Derived class called.
```