

Question no:1: Predict the output or Identify Error of the following programs.

<pre>#include <iostream> using namespace std; class ABC{ int p; public: ABC () { p=0; cout <<"inside constructor" << endl;} ~ABC() { cout<< "inside destructor" << endl; }}; int main(){ ABC *p = new ABC(); cout <<"terminating main method" << endl; return 0;}</pre>	<pre>1. class ABC { int a, b; public: ABC(int x = 15, int y) { a = x; b = y; } void display() { cout <<"value of a "<<a <<"value of b<<b; }}; main() { ABC obj(10); obj.display(); }</pre>
<p>2. Difference between shallow copy and Deep copy constructor.</p>	<p>3. Difference between aggregation, association and composition.</p>

Question no 2 (a): Complete Missing part of code

Question no 2 (b): What type of relationship exists between Library and Book? (Aggregation, Association, or Composition?).

```
#include <iostream>

using namespace std;

class Book {

    int bookId;

    string title, author;

public:

    Book(int id, string t, string a) : bookId(id), title(t), author(a) {}

    int getId() { return bookId; }

    void display() {

        cout << "Book ID: " << bookId << ", Title: " << title << ", Author: " << author << endl;    });

class Library {

    int libraryId, bookCount, capacity;

    string libraryName;

    Book* books;
```

public:

```
    Library(int id, string name, int size) : libraryId(id), libraryName(name), bookCount(0),  
    capacity(size) {
```

```
        books = new Book[capacity]; }  
  
void addBook(int id, string title, string author) {  
    // TODO: Implement Book Addition Logic
```

```
}
```

```
void removeBook(int id) {  
    // TODO: Implement Book Removal Logic
```

```
}
```

```
void displayLibrary() {  
    cout << "Library ID: " << libraryId << ", Name: " << libraryName << endl;
```

```
    for (int i = 0; i < bookCount; i++) {  
        books[i].display(); } }
```

```
~Library() { // TODO: Implement Destructor to Free Memory
```

```
};
```

```
main() {
```

```
    Library lib(1, "City Library", 3);
```

```
    lib.addBook(101, "The Great Gatsby", "F. Scott Fitzgerald");
```

```
    lib.addBook(102, "To Kill a Mockingbird", "Harper Lee");
```

```
    lib.displayLibrary();
```

```
    // TODO: Remove a book and handle memory cleanup
```

```
}
```