EXERCISE 3: Class Concept

The following is a class declaration for **Book**, friend function, non-member function prototype and main program. The class consists of 4 data members and 3 function members. Answer all questions in this section.

```
// Program 2.35a
class Book
{
    // Declaration of 4 data members for class Book
    string bookName, bookAuthor, category;
    float bookPrice;

  public:
    //constructor
    Book(){bookName[]="xxx"; bookAuthor ="yyy";
Error: bookName is a C++ std::string.
It is neither an array nor C-string.
bookPrice = 0.0; category = "CS";}
    // member function prototype declaration
    string checkAuthor()
    {
       return bookAuthor;
    }

    void giveDiscount(int);

                    Error: should not have ; here
    void printDetail();   // print all info about the book
    {  cout <<  bookName << bookAuthor << bookPrice << category;
    }

    // friend function declaration
    friend Book readValue();

}; // end of class declaration

// non-member function declarations
void CheckBookInfo(Book[]);

main()
{
  Book myBook[8];
  int discount;
  for (int i = 0;i < 8;i++)
     myBook[i] =  readValue();

  cout  << "Enter percentage amount of discount  : ";
  cin >> discount;

  //  Code to call function giveDiscount () using the array
  for (int i = 0;i < 8;i++)
     myBook[i].giveDiscount(discount);

// Statement that call function CheckBookInfo(Book[])-question e

} // end main()
```

a) The following function in Program 2.35b is an application function for `readValue()`. Describe what the function does and what value does the function returns.

```
38  // Program 2.35b
39  Book readValue()
40  {  Book aBook;
41     string bookName, bookAuthor, category;
42     float bookPrice;
43     cout << "Please enter the book title " <<  ": ";
44     getline(cin, aBook.bookName);
45
46     cout << "Please enter the name of the author " <<  ": ";
47     getline(cin, aBook.bookAuthor);
48
49     cout << "Please enter the book category " <<  ": ";
50     getline(cin, aBook.category);
51
52     cout << "Please enter the price of the book " <<  ": ";
53     cin >> aBook.bookPrice;
54     cin.ignore();
55
56     return aBook;
57  }
```

b) Explain the purpose of statement 37 and 38 in `main()` function.

```
for (int i = 0;i < 8;i++)
     myBook[i] =  readValue();
```

c) Write code for member function `giveDiscount(int)` that will set the new price for the book based on the percentage amount specified in the parameter. If the book was written by "**Norbahiah**", reduce the price based on the discount. No discount will be given to any book written by other authors. Give appropriate message if no discount is applied.

Please see exercise3.cpp,lines 48-64.

d) Function `CheckBookInfo(Book[])` receives array of `Book`. Write implementation for the function that will count how many book is categorized as CS (Computer Science) book and use function `printDetail()` to print the detail information of the books in that category.

Please see exercise3.cpp,lines 66-88.

e) Write a statement in `main()` that can call function `CheckBookInfo(Book[])`

Please see exercise3.cpp, line 132.

a)

It constructs an object of "Book" type (user-defined type) called "aBook", takes various input values from the user via stdin (with std::getline and std::cin), then sets the "Book" object's private data members to those input values. It can access the private members because it is declared a friend function in the "Book" class.

It then returns the "Book" object, "aBook".

"stdin" refers to the standard input, see https://en.wikipedia.org/wiki/Standard_streams

b)

To iterate through every element of the "myBook" array of "Book"-type objects (8 times), with every iteration calling the readValue() function, hence through it, constructing an object of "Book" type, then accepting input values from the user via stdin, and assigning those values to the data members of the constructed object, then returning the value of the readValue() function and storing it in the current iteration of the "myBook" element in the "myBook" array.