NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES

PROGRAM: SOFTWARE ENGINEERING

DATA STRUCTURES LAB

LAB TASK-01

SUBMITTED BY:

Name: Ahmed Ali

Roll No: 22P-9318

INSTRUCTOR NAME: Sir Saood Sarwar

A DEPARTMENT OF COMPUTER SCIENCE

Q1 CODE:

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

class book_details
{
	public:
	   string name;
	   string author;
	   int quantity;
};

class Inventory
{
	private:
	   book_details **inventory;
	   int size;
	   int capacity;

	   void increase_size()
		{
	      capacity=capacity * 2;	//double the capacity:
	      book_details **new_inventory=new book_details*[capacity];	//creating new array with increased capacity
	      for(int i=0; i<size; i++)
			{
```

```
            new_inventory[i]=inventory[i];     //copying elements to new array
        }
        delete[] inventory;  //delete old array
        inventory=new_inventory;  //updating pointer:
    }

  public:
    Inventory()
          {
        size=0;
        capacity=10;
        inventory=new book_details*[capacity];
    }

    ~Inventory()
          {
        for(int i=0; i<size; i++)
                {
          delete inventory[i];
        }
        delete []inventory;
    }

void add()
    {
  if(size==capacity)
          {
     increase_size();
  }
```

```
    book_details *new_book=new book_details;
    cout<<"Enter book name: ";
    cin>>new_book->name;
    cout<<"Enter author name: ";
    cin>>new_book->author;
    cout<<"Enter quantity: ";
    cin>>new_book->quantity;

    inventory[size++]=new_book;
}

void sell()
        {
    string name;
    cout<<"Enter book name to sell: ";
    cin>>name;
    for(int i=0; i<size; i++)
                    {
       if(inventory[i]->name==name)
                                {
          if(inventory[i]->quantity>0)
                                        {
             inventory[i]->quantity--;
             cout<<"sold successfully"<<endl;
          }
                                        else
                                        {
             cout<<"Not available"<<endl;
          }
```

```
            return;
        }
    }
    cout<<"not found"<<endl;
}

void find()
        {
    string author;
    cout<<"Enter author name: ";
    cin>>author;
    for(int i=0; i<size; i++)
                {
        if(inventory[i]->author==author)
                        {
            cout<<"Title: "<<inventory[i]->name<<", Quantity: "<<inventory[i]->quantity<<endl;
        }
    }
}

void display()
        {
    for(int i=0; i<size; i++)
                {
        cout<<"Title: "<<inventory[i]->name<<", Author: "<<inventory[i]->author<<", Quantity:
"<<inventory[i]->quantity<<endl;
    }
}
```

```
void update()
        {
   string name;
   int new_quantity;
   cout<<"Enter book name to update quantity: ";
   cin>>name;
   cout<<"Enter new quantity: ";
   cin>>new_quantity;
   for(int i=0; i<size; i++)
                {
      if(inventory[i]->name==name)
                        {
         inventory[i]->quantity=new_quantity;
         cout<<"Quantity updated"<<endl;
         return;
      }
   }
   cout<<"not found"<<endl;
}

void delete_book()
        {
   string name;
   cout<<"Enter book name to delete: ";
   cin>>name;
   for(int i=0; i<size; i++)
                {
      if(inventory[i]->name==name)
                        {
```

```
            delete inventory[i];
            for(int j=i; j<size-1; j++)
                                        {
               inventory[j]=inventory[j+1];
            }
            size--;
            cout<<"Book deleted"<<endl;
            return;
         }
      }
      cout<<"not found"<<endl;
}

void sales_report()
         {
      for(int i=0; i<size-1; i++)
                     {
         for(int j=0; j<size-1-i; j++)
                                 {
            if(inventory[j]->quantity<inventory[j+1]->quantity)
                                        {
               book_details *temp=inventory[j];
               inventory[j]=inventory[j+1];
               inventory[j+1]=temp;
            }
         }
      }

      cout<<"Sales Report: "<<endl;
```

```
    for(int i=0; i<size; i++)
                    {
        cout<<"Rank "<<i+1<<": Name: "<<inventory[i]->name<<", Author: "<<inventory[i]->author<<",
Quantity Sold: "<<inventory[i]->quantity<<endl;
    }
  }

  void exit()
        {
    cout<<"Good byeee & Thank you!"<<endl;
  }
};

int main()
{
  Inventory in_stock;
  int choice;
  do
        {
    cout<<"1. Add "<<endl;
    cout<<"2. Sell "<<endl;
    cout<<"3. Find "<<endl;
    cout<<"4. Display "<<endl;
    cout<<"5. Update quantity"<<endl;
    cout<<"6. Delete "<<endl;
    cout<<"7. Sales Report"<<endl;
    cout<<"8. Exit"<<endl;

    cout<<"Enter your choice: ";
```

```
cin>>choice;


switch(choice)
                {
   case 1:
      in_stock.add();
      break;
   case 2:
      in_stock.sell();
      break;
   case 3:
      in_stock.find();
      break;
   case 4:
      in_stock.display();
      break;
   case 5:
      in_stock.update();
      break;
   case 6:
      in_stock.delete_book();
      break;
   case 7:
      in_stock.sales_report();
      break;
   case 8:
      in_stock.exit();
      break;
   default:
```

```
            cout<<"Invalid choice, try again please!"<<endl;
        }
    }
        while(choice!=8);
    return 0;
}
```

Output–01 ;

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```
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 1
Enter book name: Emma
Enter author name: Jane
Enter quantity: 5
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 1
Enter book name: Dracula
Enter author name: Brame
Enter quantity: 10
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 2
Enter book name to sell: Dracula
sold successfully
```

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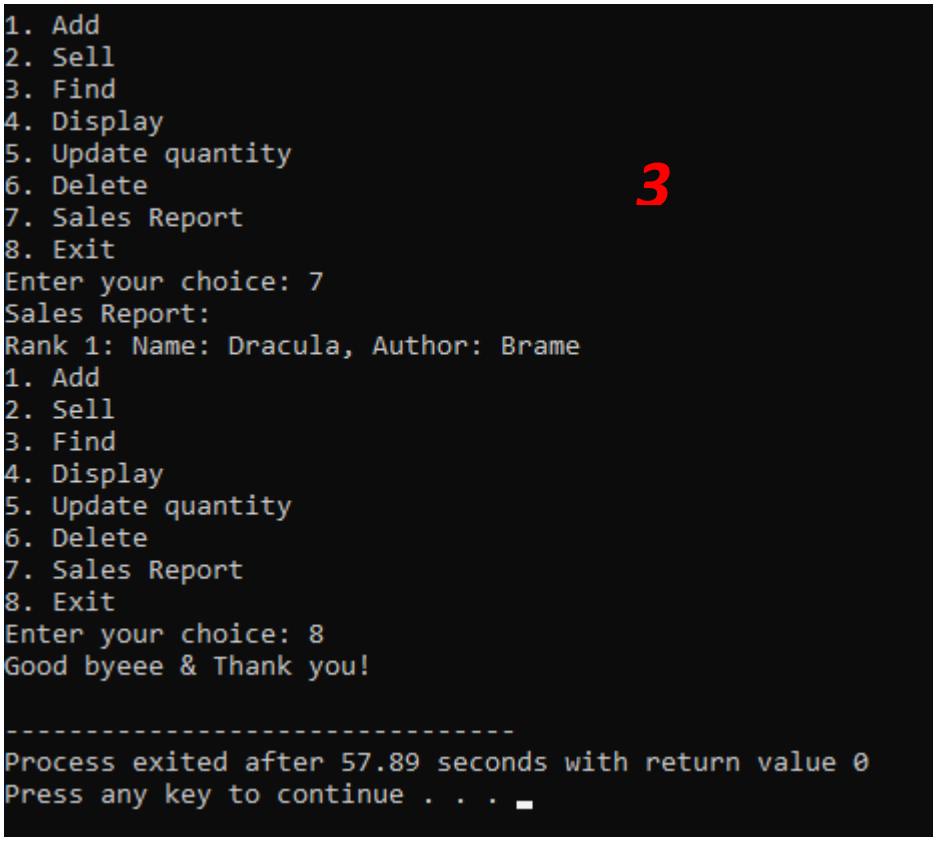
```
Enter your choice: 3
Enter author name: Brame
Title: Dracula, Quantity: 9
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 4
Title: Emma, Author: Jane, Quantity: 5
Title: Dracula, Author: Brame, Quantity: 9
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 5
Enter book name to update quantity: Emma
Enter new quantity: 7
Quantity updated
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 6
Enter book name to delete: Emma
Book deleted
```

2


1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 7
Sales Report:
Rank 1: Name: Dracula, Author: Brame
1. Add
2. Sell
3. Find
4. Display
5. Update quantity
6. Delete
7. Sales Report
8. Exit
Enter your choice: 8
Good byeee & Thank you!

Process exited after 57.89 seconds with return value 0
Press any key to continue . . .
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