

1) Create Java classes having suitable attributes for Library management system. Use OOPs concepts in your design. Also try to use interfaces and abstract classes.

```
public enum BookStatus
{
    AVAILABLE,
    NOTAVAILABLE
}
```

```
public enum AccountStatus{
    ACTIVE,
    CLOSED
}
```

Person Class

```
public class Person {
    private String name;
    private String phone;
}
```

Account Class

```
public abstract class Account
{
    private String id;
    private String password;
    private AccountStatus status;
    private Person person;
}
```

Librarian Class

```
public class Librarian extends Account {
    public void addBookItem();
    public void removeBookItem();
}
```

MemberClass

```
public class Member extends Account
{
    private int totalBooksIssued;
    public void getTotalBooksIssued();
    public void IssueBooks();
    public void returnBooks();
}
```

```
private void checkForFine();  
}
```

BookIssue Class

```
public class BookIssue {  
    private String memberId;  
    public static getIssueDetails();  
}
```

Fine Class

```
public class Fine  
{  
    private String creationDate;  
    private String bookname;  
    private String memberId;  
  
    public static void collectFine()  
}
```

Book Class

```
public abstract class Book {  
  
    private String title;  
    private String subject;  
    private String publisher;  
  
}  
  
public class Books extends Book {  
    private float price;  
    private BookStatus status;  
    public void checkout(String memberId);  
}
```

3) WAP to produce NoClassDefFoundError and ClassNotFoundException exception.

ClassNotFound

```
public class Que3  
{  
    public static void f()  
    {
```

```

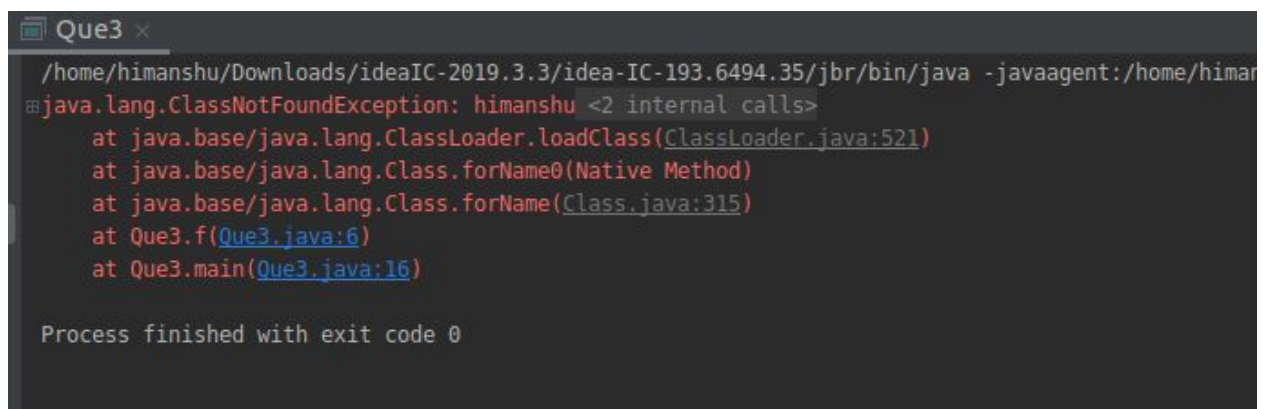
    try {
        Class.forName("himanshu");
    } catch (ClassNotFoundException e) {
        {
            e.printStackTrace();
        }
    }

    public static void main(String[] args) {

        f();
    }
}

```

Output:



The screenshot shows a terminal window titled "Que3 x". The command executed is `/home/himanshu/Downloads/ideaIC-2019.3.3/idea-IC-193.6494.35/jbr/bin/java -javaagent:/home/himanshu/Downloads/ideaIC-2019.3.3/idea-IC-193.6494.35/jbr/bin/javaagent.jar`. The output shows a `java.lang.ClassNotFoundException: himanshu` with the following stack trace:

```

java.lang.ClassNotFoundException: himanshu <2 internal calls>
    at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:521)
    at java.base/java.lang.Class.forName0(Native Method)
    at java.base/java.lang.Class.forName(Class.java:315)
    at Que3.f(Que3.java:6)
    at Que3.main(Que3.java:16)

```

At the bottom, it says "Process finished with exit code 0".

NoClassDefFoundError

.class file of Classdef is removed so it gives NoClassDefFoundError

```

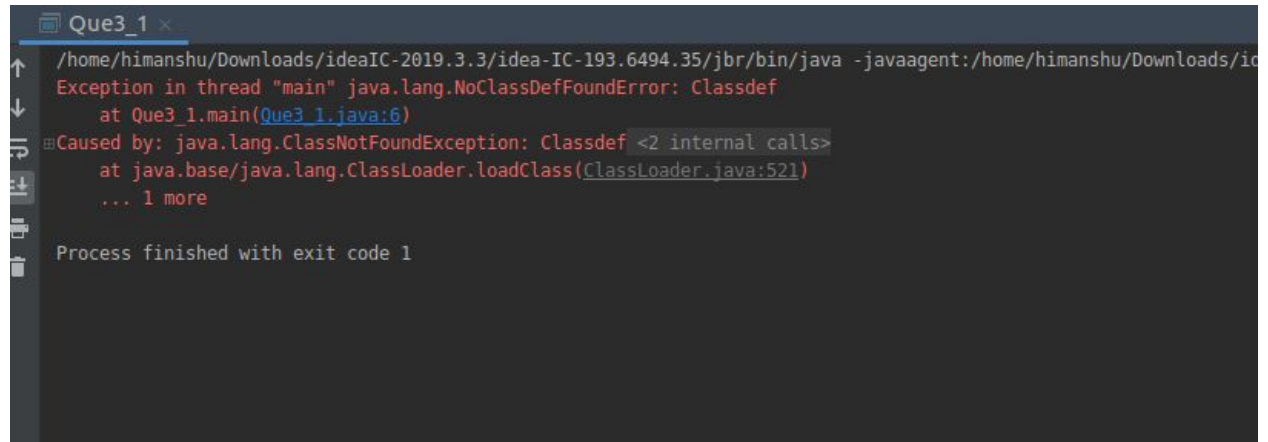
public class Que3_1
{
    public static void main(String[] args)
    {

        Classdef classdef = new Classdef();
    }
}

```

```
}  
public class Classdef  
{  
  
}
```

Output:



The screenshot shows a terminal window titled "Que3_1 x". The command executed is `/home/himanshu/Downloads/ideaIC-2019.3.3/idea-IC-193.6494.35/jbr/bin/java -javaagent:/home/himanshu/Downloads/ic`. The output shows an exception in the main thread: `java.lang.NoClassDefFoundError: Classdef` at `Que3_1.main(Que3_1.java:6)`. The stack trace indicates the error was caused by `java.lang.ClassNotFoundException: Classdef` with 2 internal calls, originating from `java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:521)`. The process finished with exit code 1.

```
/home/himanshu/Downloads/ideaIC-2019.3.3/idea-IC-193.6494.35/jbr/bin/java -javaagent:/home/himanshu/Downloads/ic  
Exception in thread "main" java.lang.NoClassDefFoundError: Classdef  
    at Que3_1.main(Que3_1.java:6)  
Caused by: java.lang.ClassNotFoundException: Classdef <2 internal calls>  
    at java.base/java.lang.ClassLoader.loadClass(ClassLoader.java:521)  
    ... 1 more  
  
Process finished with exit code 1
```