```
Enter book information, type "STOP" to stop
Java Foundations    Lewis et al    2015H
isAtLibrary: Java Foundations by Lewis et al published in 2015 is at the House of Learning Library
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2015L
isAtLibrary: Java Foundations by Lewis et al published in 2015 is at the Main Library
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2015O
isAtLibrary: Java Foundations by Lewis et al publishef in 2015 is at a library that is not at TRU
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2015X
isAtLibrary: Book inputed does not have one of the required final character
Enter a book title or STOP to quit: Java Foundations    Lewis et al    201xH
201x is an invalid year
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2015
java.lang.StringIndexOutOfBoundsException: Book inputed is too short
Enter a book title or STOP to quit: Java Foundations     Lewis et al    2015
 201 is an invalid year
Enter a book title or STOP to quit: Java Foundations    Lewis et al    1999H
YearCheck: Java Foundations published in 1999 is too old
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2020H
YearCheck: Java Foundations published in 2020 is an invalid year
Enter a book title or STOP to quit: Java Foundations    Lewis et al      2015H
java.lang.StringIndexOutOfBoundsException: Book inputed is too long
Enter a book title or STOP to quit: Java Foundations       Lewis et al Java Foundations    Lewis et al    H    2015H
java.lang.StringIndexOutOfBoundsException: Book inputed is too long
Enter a book title or STOP to quit: Java Foundations    Lewis et al    H
java.lang.StringIndexOutOfBoundsException: Book inputed is too short
Enter a book title or STOP to quit: Java Foundations        Lewis et al    2015H
java.lang.StringIndexOutOfBoundsException: Book inputed is too long
Enter a book title or STOP to quit: Java Foundations    2015H
java.lang.StringIndexOutOfBoundsException: Book inputed is too short
Enter a book title or STOP to quit: Lewis et al    2015H
java.lang.StringIndexOutOfBoundsException: Book inputed is too short
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2020L
YearCheck: Java Foundations published in 2020 is an invalid year
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2019L
isAtLibrary: Java Foundations by Lewis et al published in 2019 is at the Main Library
Enter a book title or STOP to quit: Java Foundations    Lewis et al    2000L
isAtLibrary: Java Foundations by Lewis et al published in 2000 is at the Main Library
Enter a book title or STOP to quit: STOP
Program has stopped

Process finished with exit code 0
```

```java
/*
    Student name: Vu Nguyen
    Student number: T00612390
    Due date: Oct 22, 2019
    Seminar: 5

    Description: This is the isAtLibrary exception for the BookInput class.
                 This exception just returns the string s, some message s.
                 None of the Checked throwable exceptions fit the naming description
                 so this was made and does a generic thing, prints the message.
*/
public class isAtLibrary extends Exception
    {

        public  isAtLibrary()
            {
            super("The value inputted is valid");
            }


        public isAtLibrary(String s)
            {
                super(s);
            }




    }
```

```java
/*
    Student name: Vu Nguyen
    Student number: T00612390
    Due date: Oct 22, 2019
    Seminar: 5

    Description: This is the YearCheck exception for the BookInput class.
                This exception just returns the string s, some message s.
                None of the Checked throwable exceptions fit the naming description
                so this was made and does a generic thing, prints the message.
*/

public class YearCheck extends Exception
    {
        public YearCheck()
        {
            super("The value inputted is valid");
        }

        public YearCheck(String s)
        {
            super(s);
        }
    }
```

```java
/*
    Student name: Vu Nguyen
    Student number: T00612390
    Due date: Oct 22, 2019
    Seminar: 5

    Description: This  BookInput class is a program that takes in a string,
    40 long, 20 for the title, 15 for author, 4 for the year, and 1 for the book location.

    ie:    Java Foundations    Lewis et al    2015H
           | ←  20 chars   →  |←15 chars→   |

*/
import java.util.Scanner;
import java.lang.Exception;
public  class BookInput
   {

       public static void main(String[] args)
       {

           String bookInfo;
           boolean check = true;
           String title;
           String author;
           int year;
           char library;


           Scanner input = new Scanner(System.in);
           System.out.println("Enter book information, type \"STOP\" to stop ");
           bookInfo = input.nextLine();


           while (!bookInfo.equals("STOP"))
              {


                 try
                    {
                    // System.out.println(bookInfo.length());


                       //these are specific scenarios that indicate a missing section:
                       //                           title, author, or year

                       // wouldn't make too much sense to put these in since .length()
                       // might be 20, but not necessarilybe missing the title section
                       // but might be useful if needed.

                       //           if(bookInfo.length() == 20)
                       //              throw new StringIndexOutOfBoundsException("Book inputed is
                       //            missing title section ");
                       //
                       //           if(bookInfo.length() == 35)
                       //              throw new StringIndexOutOfBoundsException("Book inputed is
                       //                          missing author section");
                       //
                       //           if(bookInfo.length() == 39)
                       //              throw new StringIndexOutOfBoundsException("Book inputed is
                       //                          missing year section");
                       //


                       //this if-statement checks and throws NumberFormatException exception whether or not
```

```java
66              //                                    the year is too old and new
67              if (bookInfo.length() > 40)
68                  throw new StringIndexOutOfBoundsException("Book inputed is too long");
69              if (bookInfo.length() < 40)
70                  throw new StringIndexOutOfBoundsException("Book inputed is too short");
71
72
73              title = bookInfo.substring(0, 19);
74              author = bookInfo.substring(20, 35);
75              year = Integer.parseInt(bookInfo.substring(35, 39));
76              library = bookInfo.charAt(39);
77
78              //this checks and then throws a NumberFormatException if the year is too old
79              //                                             or new*
80
81               if(year > 2019)
82                  {
83                  throw new YearCheck(title.trim() + " published in " + year +
84                                          " is an invalid year");
85                  }
86              else if (year < 2000)
87                  {
88                  throw new YearCheck(title.trim() + " published in " + year +
89                                          " is too old");
90                  }
91
92              //these four if-statements checks, then throws the isAtLibrary exception
93              //           whether or not the final-character has been satisfied
94
95
96              if (library == 'H')
97                  throw new isAtLibrary(title.trim() + " by " + author.trim() +
98                      " published in " + year + " is at the House of Learning Library");
99
100             if (library == 'L')
101                 throw new isAtLibrary(title.trim() + " by " + author.trim() +
102                     " published in " + year + " is at the Main Library");
103
104             if (library == 'O')
105                 throw new isAtLibrary(title.trim() + " by " + author.trim() + " publishef in "
106                                         + year + " is at a library that is not at TRU");
107
108             if (library != 'h' | library != 'L' | library != 'O')
109                 throw new isAtLibrary("Book inputed does not have one of the " +
110                     "                         required final character");
111
112
113             }
114         //Start of exception catch blocks
115
116         //unique exception to check the year
117         catch (YearCheck exception)
118             {
119             System.out.println(exception);
120             }
121
122         //unique exception to check the book location
123         catch (isAtLibrary exception)
124             {
125             System.out.println(exception);
126             }
127
128         catch(StringIndexOutOfBoundsException exception)
129             {
130             System.out.println(exception);
```

```java
131                 }
132
133             catch(NumberFormatException exception)
134                 {
135
136                 System.out.println(bookInfo.substring(35, 39) + " is an invalid year");
137                 }
138
139             catch(ArithmeticException exception)
140                 {
141                 System.out.println("incorrect calculation");
142                 }
143
144
145             System.out.print("Enter a book title or STOP to quit: ");
146             bookInfo = input.nextLine();
147
148
149             }
150         //if input == "STOP", program goes through these two lines
151         System.out.println("Program has stopped");
152
153         //not sure if it's 100% needed, but here we close the scanner stream.
154         input.close();
155     }
156 }
157
158
159
160
```