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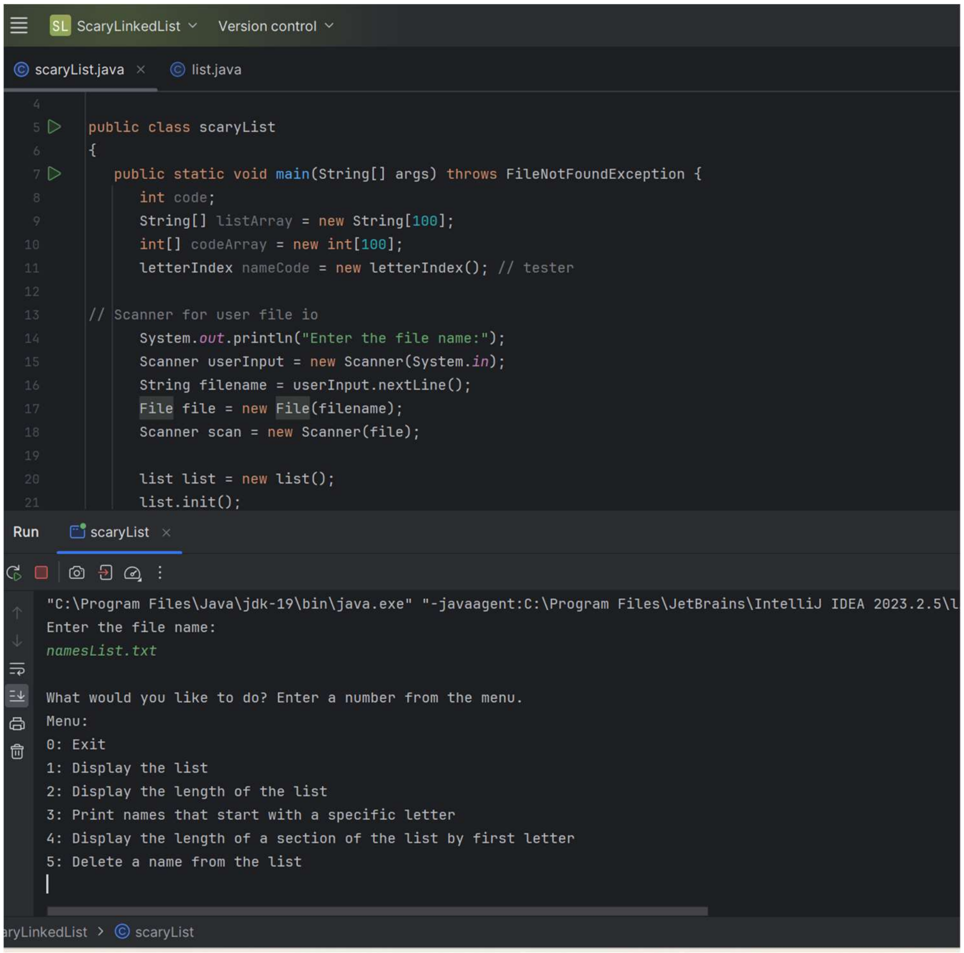
CMPS 390

Program 4 – Sacry Linked List

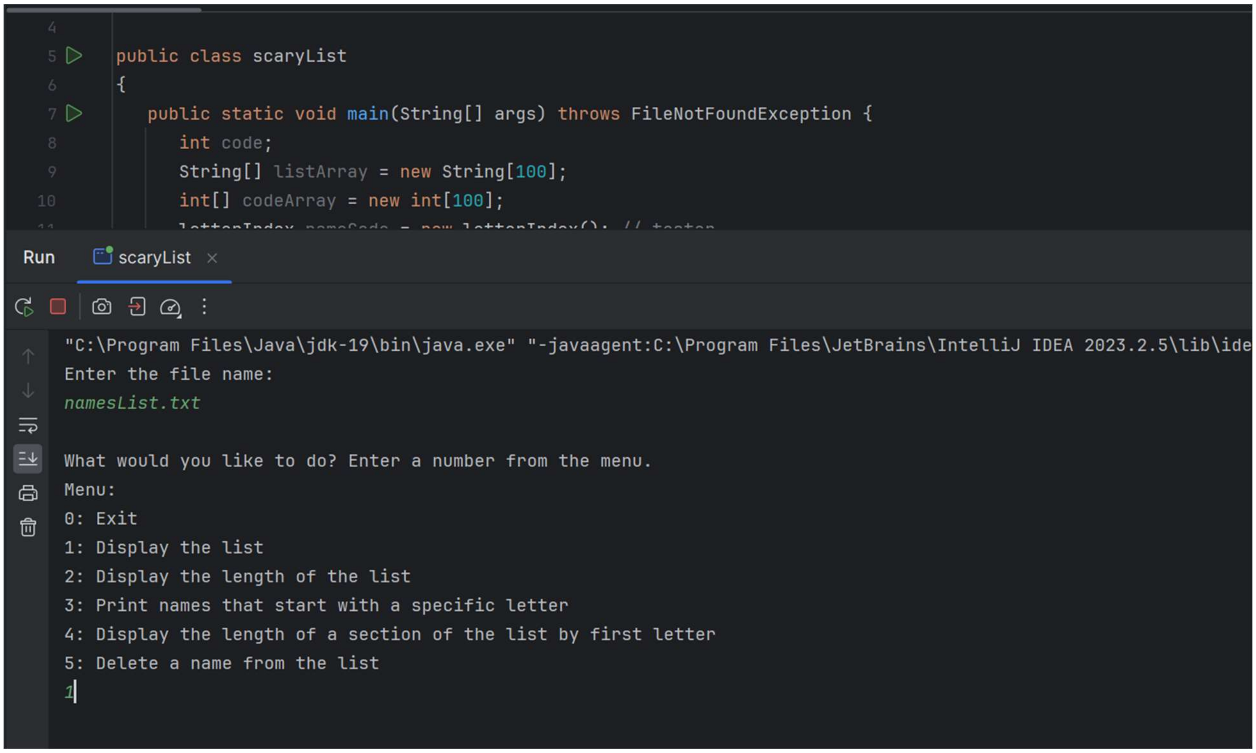
/* This program uses a linked list to take in a file of names from the user and sort them alphabetically. It starts with asking the user for the file name. Once they enter the name, a menu displays giving them the option to 1) display the list, 2) Display the length of the list 3) Print names that start with a specific letter, 4)Display the length of a section of the list by first letter, 5) Delete a name from the list,
and they can enter 0 to exit. The menu returns after every action the user chooses is complete until they press option 0 to exit. It uses methods called delete to delete names. It uses a method called addNode that uses methods called addNode and addFirst to insert names alphabetically. It uses methods called convertName to convert names into a base 26 number to insert them in order. It also uses a method called firstLetter to make an index. It has methods showList to print it out and showIndex to print out a section of the list. The last method is display menu, which gives the user a menu to choose their next action from.
* */



```

public class scaryList
{
   public static void main(String[] args) throws FileNotFoundException {
      int code;
      String[] listArray = new String[100];
      int[] codeArray = new int[100];
      letterIndex nameCode = new letterIndex(); // tester

// Scanner for user file io
      System.out.println("Enter the file name:");
      Scanner userInput = new Scanner(System.in);
      String filename = userInput.nextLine();
      File file = new File(filename);
      Scanner scan = new Scanner(file);

      list list = new list();
      list.init();
```

```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2023.2.5\l
Enter the file name:
namesList.txt

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
|
```

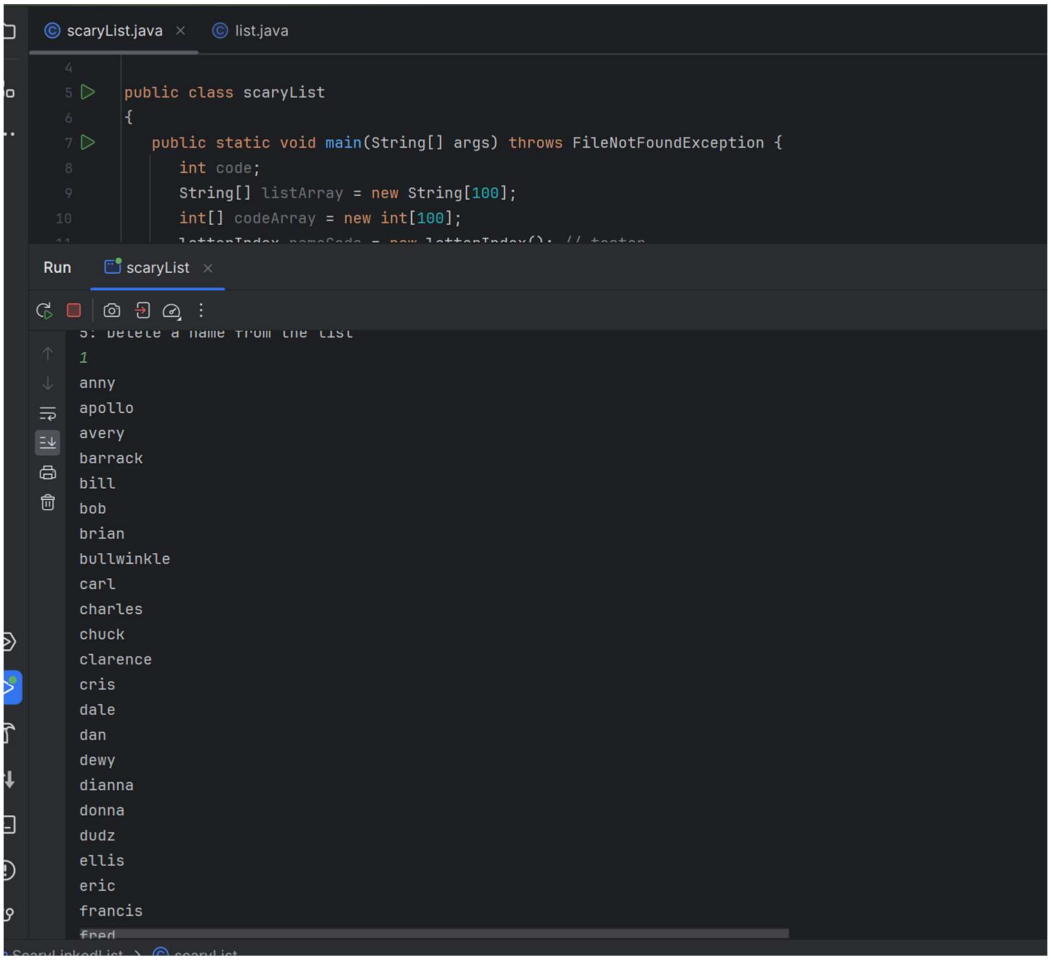
After the user enters a file name, the display menu appears. The menu keeps prompting after every action is completed until the user presses option 0 to exit the menu.



```java

public class scaryList
{
    public static void main(String[] args) throws FileNotFoundException {
        int code;
        String[] listArray = new String[100];
        int[] codeArray = new int[100];
        letterIndex nameCode = new letterIndex(); // tester
```

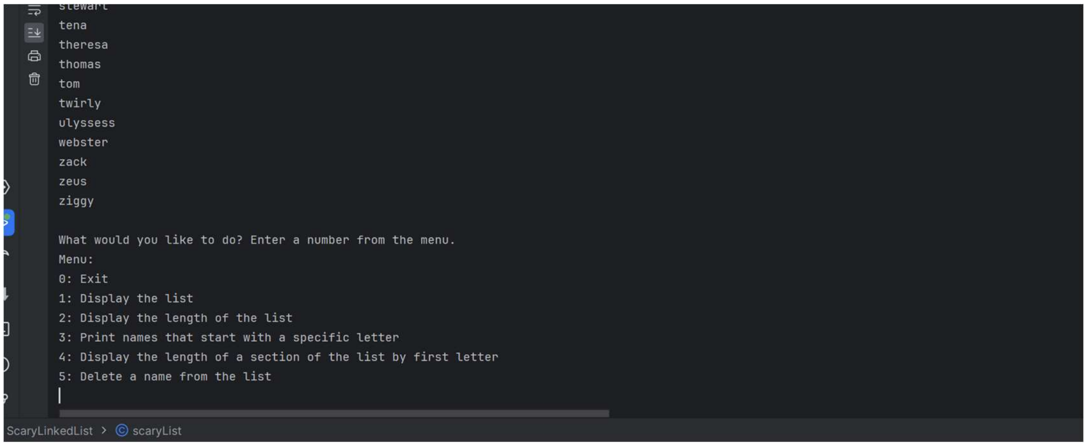
```
"C:\Program Files\Java\jdk-19\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA 2023.2.5\lib\ide
Enter the file name:
namesList.txt

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
1
```

Option 1 is to show the list in alphabetical order.



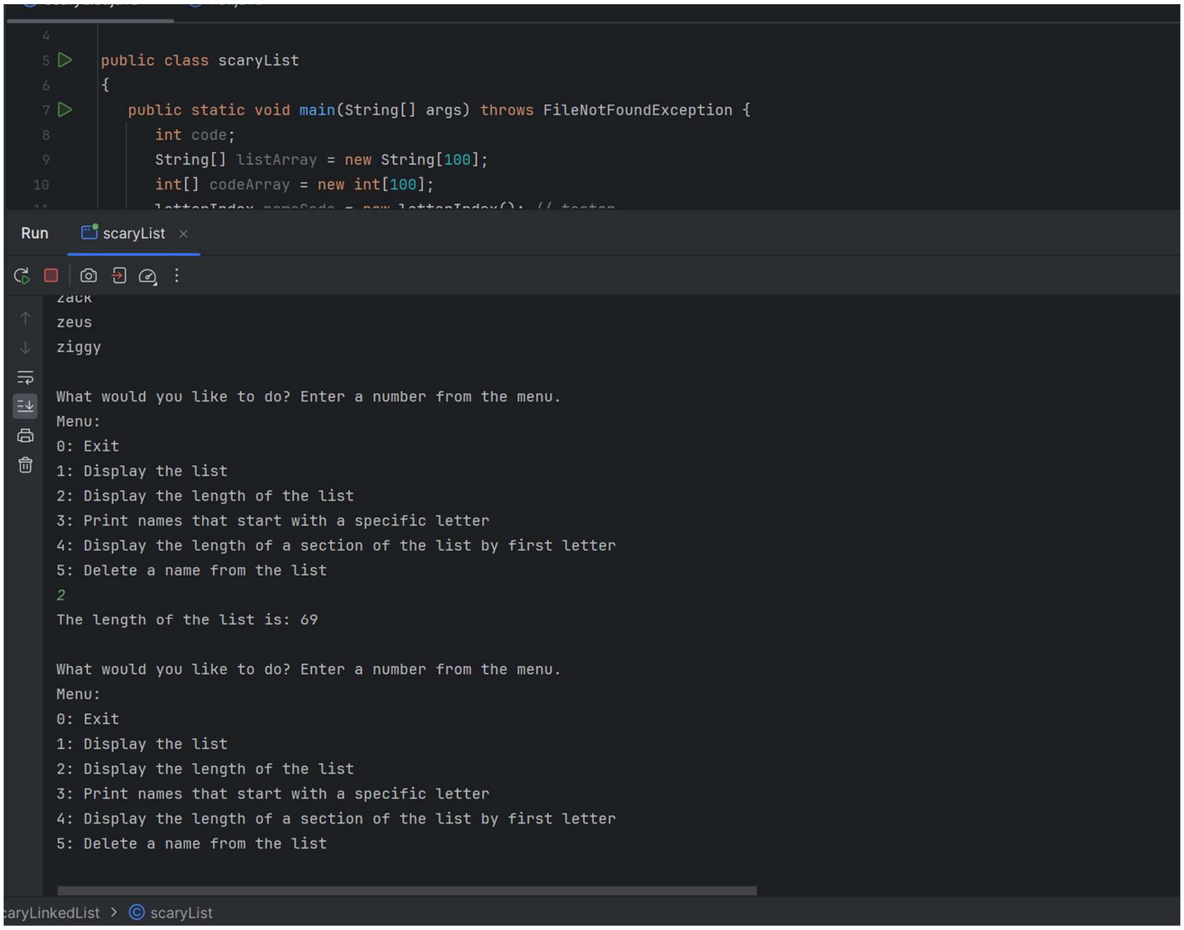
```java

public class scaryList
{
    public static void main(String[] args) throws FileNotFoundException {
        int code;
        String[] listArray = new String[100];
        int[] codeArray = new int[100];
        letterIndex nameCode = new letterIndex(); // tester
```

```
5: Delete a name from the list
1
anny
apollo
avery
barrack
bill
bob
brian
bullwinkle
carl
charles
chuck
clarence
cris
dale
dan
dewy
dianna
donna
dudz
ellis
eric
francis
fred
```



```
stewart
tena
theresa
thomas
tom
twirly
ulyssess
webster
zack
zeus
ziggy

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
```

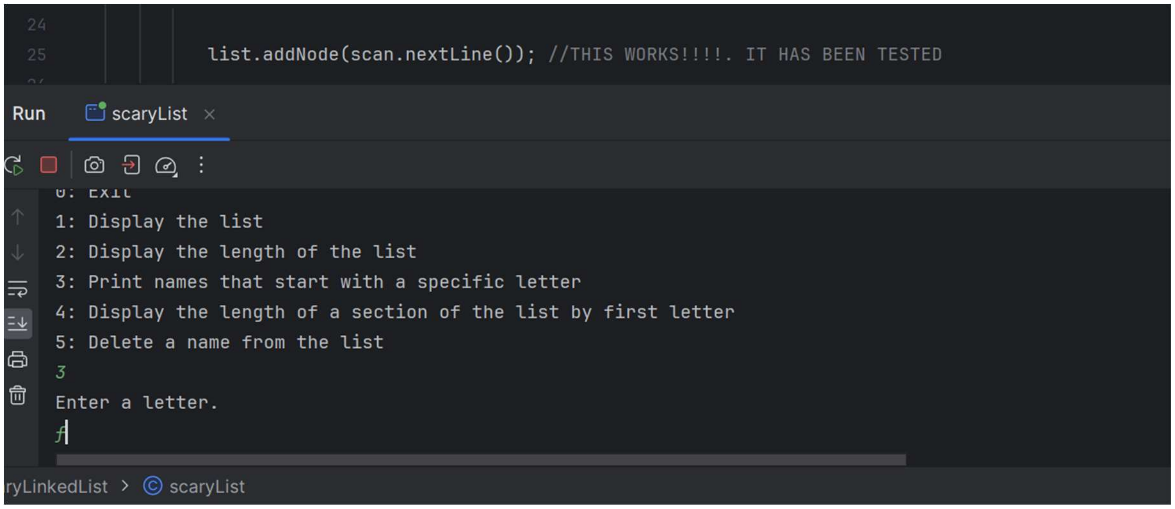
Option 2 will give the user the length of the list.



```

public class scaryList
{
    public static void main(String[] args) throws FileNotFoundException {
        int code;
        String[] listArray = new String[100];
        int[] codeArray = new int[100];
        letterIndex nameCode = new letterIndex(); // tester
```

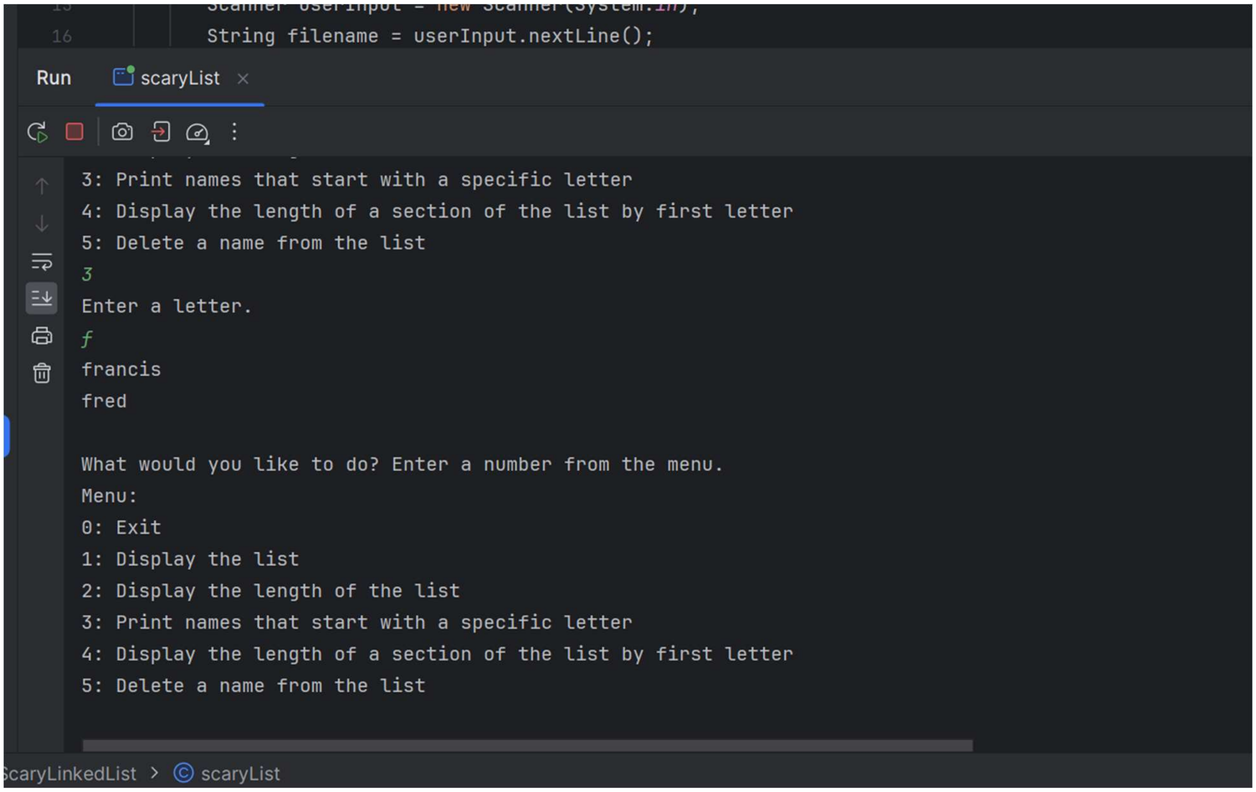
```
zack
zeus
ziggy

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
2
The length of the list is: 69

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
```

Option 3 will let them print a name of a certain index.



```
            list.addNode(scan.nextLine()); //THIS WORKS!!!!. IT HAS BEEN TESTED
```

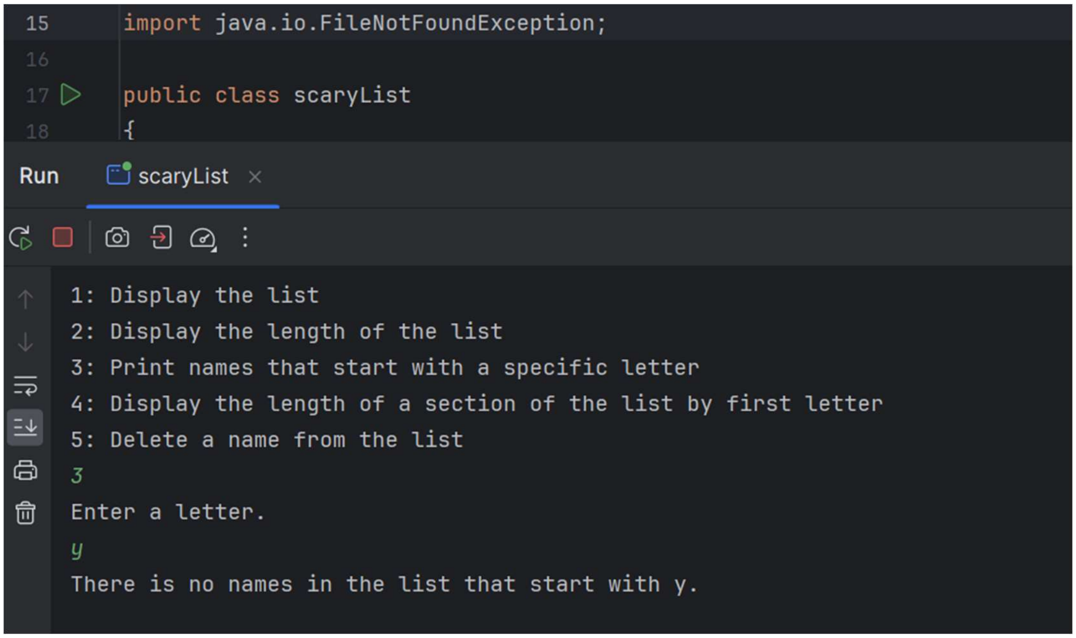
```
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
3
Enter a letter.
f
```



```
        Scanner userInput = new Scanner(System.in);
        String filename = userInput.nextLine();
```

```
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
3
Enter a letter.
f
francis
fred

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
```

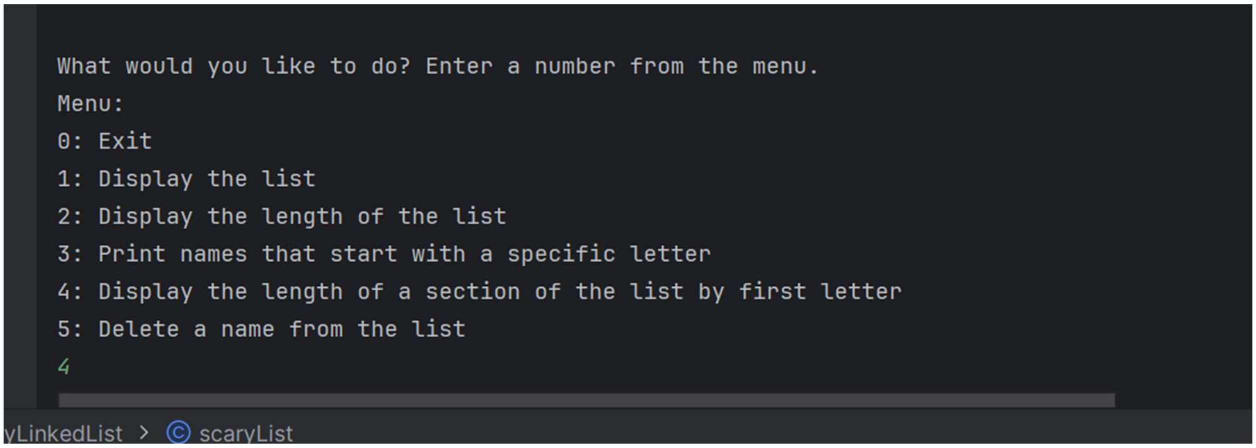
If there are no names in the list that start with that letter, it will give the user a message telling them that.



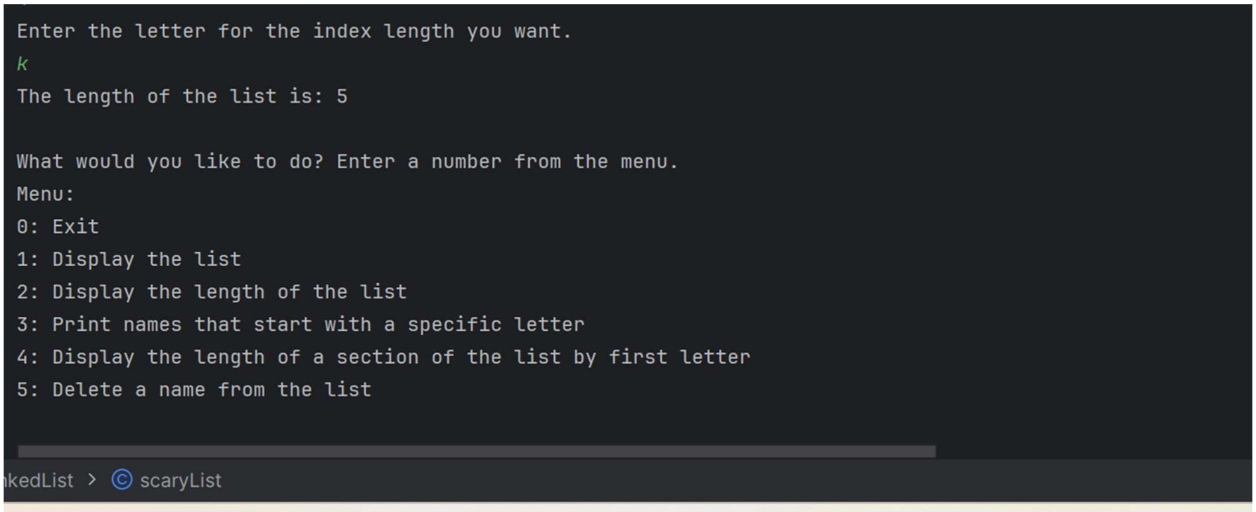
```
import java.io.FileNotFoundException;

public class scaryList
{
```

```
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
3
Enter a letter.
y
There is no names in the list that start with y.
```

Option 4 will display the length of a specified index.

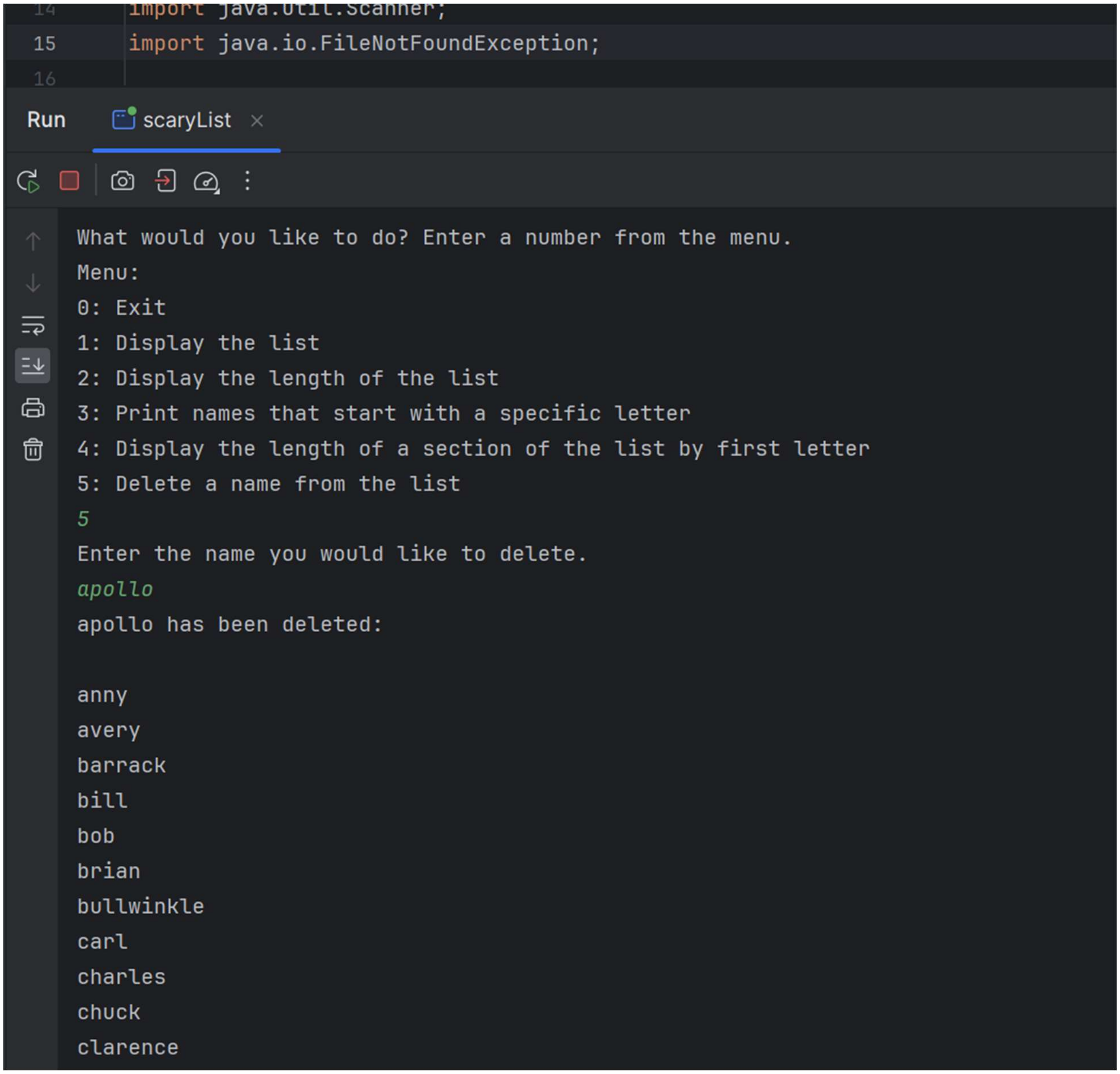


```
What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
4
```



```
Enter the letter for the index length you want.
k
The length of the list is: 5

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
```

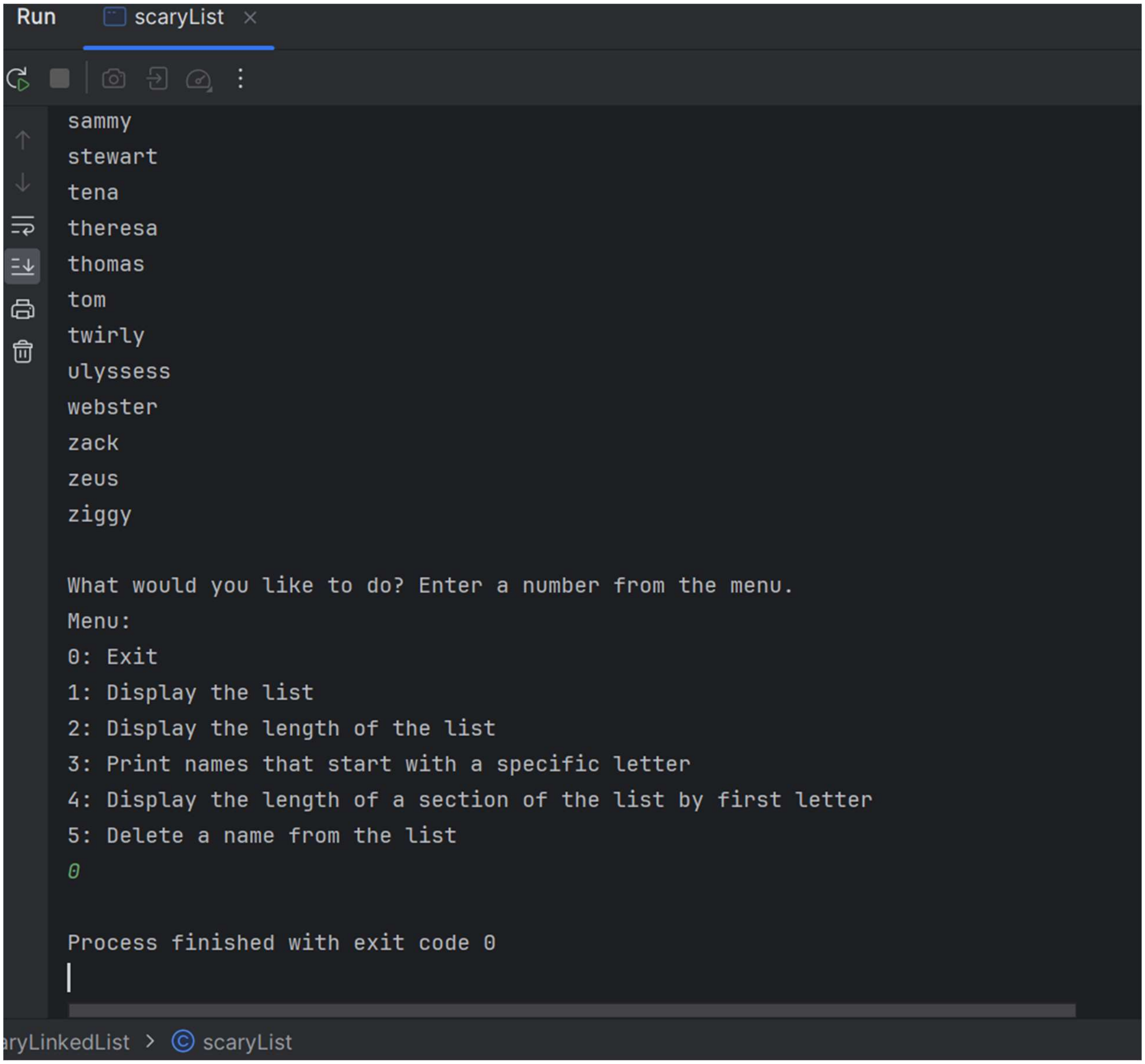
Option 5 will let the user delete a name from the list.



```java
import java.util.Scanner;
import java.io.FileNotFoundException;
```

```
What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
5
Enter the name you would like to delete.
apollo
apollo has been deleted:

anny
avery
barrack
bill
bob
brian
bullwinkle
carl
charles
chuck
clarence
```

Option 0 will let them exit the program.



```
sammy
stewart
tena
theresa
thomas
tom
twirly
ulyssess
webster
zack
zeus
ziggy

What would you like to do? Enter a number from the menu.
Menu:
0: Exit
1: Display the list
2: Display the length of the list
3: Print names that start with a specific letter
4: Display the length of a section of the list by first letter
5: Delete a name from the list
0

Process finished with exit code 0
```

scaryList.java (main method)

```
import java.io.File;
import java.util.Scanner;
import java.io.FileNotFoundException;

public class scaryList
{
  public static void main(String[] args) throws FileNotFoundException {
    int code;
    String[] listArray = new String[100];
    int[] codeArray = new int[100];
    letterIndex nameCode = new letterIndex(); // tester

// Scanner for user file io
    System.out.println("Enter the file name:");
    Scanner userInput = new Scanner(System.in);
    String filename = userInput.nextLine();
    File file = new File(filename);
    Scanner scan = new Scanner(file);

    list list = new list();
    list.init();

    while(scan.hasNextLine()){

      list.addNode(scan.nextLine());

    } //close while loop

    //Display Menu
    list.displayMenu();

  } //close main
} // close scary list class
```

list.java

```
import java.util.Scanner;

public class list {
  Scanner sc = new Scanner(System.in);
  String data;
  node next;
  node curr;
  node front;
  node tail;
  node spot;
  node prev;
  node newNode;
  node temp;
  int count = 0;

  // initialize list
  public void init() {
    front = null;
  } // close init

  // makeNode: Method to create a new node
  public node makeNode(String data) {
    newNode = new node();
    newNode.data = data;
    newNode.next = null;

    return newNode;
  } // close make node

  // addFirst: Method to add to the beginning of a list in alphabetical order
  public node addFirst(String n) {
```

```
  front = curr;
  if (front == null) {
    front = makeNode(n);
  } else {
    newNode = makeNode(n);
    newNode.next = curr;
    front = newNode;
  }
  return front;
}// close add last

// addLast: Method to add to the end of a list
public node addLast(String data) {
  if (front == null) {
    front = makeNode(data);
    tail = front;
  } else {
    tail = findTail();
    tail.next = makeNode(data);
    tail = tail.next;
    tail.next = null;
  }
  return tail;
} // close add last

public void delete(String n){
  curr = front;
  while(curr.next != null) {
    if (convertName(curr.next.data) == convertName(n)) {;
      temp = curr;
      curr = curr.next;
      temp.next = curr.next;
      System.out.println(n + " has been deleted: \n");
      showList();
      displayMenu();
    }
    else if(convertName(curr.data) != convertName(n)){
      curr = curr.next;
    }
  }
}
```

```
// findTail: method to find last node in the list
public node findTail() {
  node curr;
  curr = front;
  while (curr.next != null) {
    curr = curr.next;
  }
  return curr;
} // close findTail

public void listLength() {
  node curr;
  curr = front;
  count = 0;
  while (curr != null) {
    count++;
    curr = curr.next;
  }
  System.out.println("The length of the list is: " + count);
} // close listLength

public void indexLength(String x) {
  int indexIt = firstChar(x);
  curr = front;
  boolean isInList = false;
  while (curr != null) {
    if(firstChar(curr.data) == indexIt){
      curr = curr.next;
      isInList = true;
      count++;
    }
    else if(curr.next == null && !isInList){
      System.out.println("There is no names in the list that start with " + x + ".");
      curr = curr.next;
    }
    else if(firstChar(curr.data) != indexIt){
      curr = curr.next;
    }
  }
  System.out.println("The length of the list is: " + count);
} // close indexLength

// showList: Method to print out a list
public void showList() {
  node curr;
  curr = front;
  while (curr != null) {
    System.out.println(curr.data);
    curr = curr.next;
  }
}// close show list

// Method to add a Node after a node in alphabetical order
public node addNext(String n) {
  newNode = makeNode(n);
  newNode.next = curr.next;
  curr.next = newNode;
  return newNode;
}// close add next

// Method to calculate base 26 value for a string.
public int convertName(String n) {
  int x, y, z, nameCode;
  x = n.charAt(0) - 'a';
  y = n.charAt(1) - 'a';
  z = n.charAt(2) - 'a';

  nameCode = (x * (26 * 26)) + (y * (26)) + (z * 1);

  return nameCode;
}// close method convertName

//Method to analyze the first char in a string
public char firstChar(String n) {
  int x, charCode;
  char first = n.charAt(0);

  return first;
}

// "insert" method called addNode
```

```
  public node addNode(String n) {
    curr = front;
    // Case1: add the first node in the list
    if (front == null) {
      newNode = addFirst(n);
      front = newNode;
    }
    // Case 2: add to front of list when newNode is < front node
    else if (convertName(front.data) > convertName(n)) {
      newNode = addFirst(n);
      front = newNode;
    }
    curr = front;
    int compare = 0;
    while (convertName(n) > convertName(curr.data)){
      //System.out.println("test");
      if(curr.next == null){
        newNode = addLast(n);
      }
      else if (convertName(n) < convertName(curr.next.data)){
        newNode = addNext(n);
      }
      else{
        curr = curr.next;
      }
    }
    return newNode;
    } // close addNode

    // Menu: Method for user menu
    public void displayMenu(){

      boolean menuOn = true;
      while(menuOn) {
        System.out.println("\nWhat would you like to do? Enter a number from the menu.
\nMenu: ");
        System.out.println("0: Exit"); // done
        System.out.println("1: Display the list");// method done
        System.out.println("2: Display the length of the list"); // method done
        System.out.println("3: Print names that start with a specific letter"); // method done
        System.out.println("4: Display the length of a section of the list by first letter"); // method
```

done

```
        System.out.println("5: Delete a name from the list");

        int x = sc.nextInt();

        if(x == 0){
          menuOn = false;
        }
        else if(x == 1){
          showList();
        }
        else if(x == 2){
          listLength();
        }
        else if(x == 3){
          System.out.println("Enter a letter.");
          showIndex(sc.next().charAt(0));
        }
        else if(x == 4){
          System.out.println("Enter the letter for the index length you want.");
          String y = String.valueOf(sc.next().charAt(0));
          indexLength(y);
        }
        else if(x == 5){
          System.out.println("Enter the name you would like to delete.");
          String nameToDelete = sc.next();
          delete(nameToDelete);
        }
      }
    } //close displayMenu

  public void showIndex(char x) {
    int indexIt;

    curr = front;
    boolean isInList = false;
    while (curr != null) {
      if(firstChar(curr.data) == x){
        System.out.println(curr.data);
        curr = curr.next;
        isInList = true;
        count++;
      }
      else if(curr.next == null && !isInList){
        System.out.println("There is no names in the list that start with " + x + ".");
        curr = curr.next;
      }
      else if(firstChar(curr.data) != x){
        curr = curr.next;
      }
    }
  } // close showIndex method
} // close List Class
```