Практическая работа №11

Вариант №7 – Цепное хеширование. Страховой полис: номер, компания, фамилия владельца.

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Код программы:

Insurance.java:

```java
public class Insurance {
    int number;
    String company;
    String surname;

    public Insurance(int number, String company, String surname) {
        this.number = number;
        this.company = company;
        this.surname = surname;
    }

    public int getNumber() {
        return number;
    }

    @Override
    public String toString() {
        return "Insurance {" +
                "number=" + number +
                ", company='" + company + '\'' +
                ", surname='" + surname + '\'' +
                '}'+"\n";
    }
}
```

HashTable.java:

```java
import java.util.*;

public class HashTable< E> {
    ArrayList<LinkedList<E>>table;
    int size;

    public HashTable(int size) {
        this.size = size;
        this.table = new ArrayList<>(this.size);

        for(int i=0;i < 10;i++){
            table.add(new LinkedList<E>());
        }
    }

    int hash(int value){
        return (int)value%size;
    }

    int hash(E n) {
        Insurance key = (Insurance) n;
        return key.number % size;
    }
```

```
24.
25.     void add(E b) {
26.         table.get(hash(b)).addLast(b);
27.         if (table.get(hash(b)).size() > 2) rehash();
28.     }
29.
30.     void rehash(){
31.         ArrayDeque<E> t =new ArrayDeque<>();
32.         for (int i = 0; i < size; ++i) {
33.             for (E el : table.get(i)) {
34.                 t.add(el);
35.             }
36.         }
37.         size = size * 2 + 1;
38.         table.clear();
39.         table = new ArrayList<>(size);
40.         for(int i=0;i<size;i++){
41.             table.add(new LinkedList<E>());
42.         }
43.         while (!t.isEmpty()) {
44.             add(t.getFirst());
45.             t.pop();
46.         }
47.     }
48.     void search(int value){
49.         for(E t:table.get(hash(value))){
50.             Insurance c= (Insurance) t;
51.             if(c.number == value){
52.                 System.out.println(c);
53.             }
54.         }
55.     }
56.
57.     void delete(int value){
58.         for(E t:table.get(hash(value))){
59.             Insurance c= (Insurance) t;
60.             if(c.number == value){
61.                 table.get(hash(value)).remove(t);
62.             }
63.         }
64.     }
65.     void print(){
66.         for(int i=0;i<size;i++){
67.             if(!table.get(i).isEmpty()) {
68.                 System.out.println(i+" : ");
69.                 for (int j = 0; j < table.get(i).size(); j++) {
70.                     System.out.println("\t"+table.get(i).get(j));
71.                 }
72.             }
73.         }
74.     }
75. }
```

StartInsurance.java:

```java
public class StartInsurance {
    public static void main(String[] args) {
        HashTable<Insurance> ht = new HashTable<>(10);
        ht.add(new Insurance(123,"yandex","ivanov"));
        ht.add(new Insurance(1005,"google","nikolaev"));
        ht.add(new Insurance(5,"amazon","axenov"));

        System.out.println("Вывод до рехеширования");
        ht.print();
        ht.add(new Insurance(2005,"netflix","ivanov"));
        ht.add(new Insurance(3005,"tesla","nikolaev"));

        System.out.println("Вывод после рехеширования");
        ht.print();
        System.out.println("\n");

        ht.search(1005);
        System.out.println("\n");

        ht.delete(1005);
        System.out.println("\n");

        System.out.println("Вывод после удаления элемента");
        ht.print();
    }
}
```

Результат выполнения программы:

```
Вывод до рехеширования
3 :
    Insurance {number=123, company='yandex', surname='ivanov'}

5 :
    Insurance {number=1005, company='google', surname='nikolaev'}

    Insurance {number=5, company='amazon', surname='axenov'}

Вывод после рехеширования
2 :
    Insurance {number=3005, company='tesla', surname='nikolaev'}

5 :
    Insurance {number=5, company='amazon', surname='axenov'}

10 :
    Insurance {number=2005, company='netflix', surname='ivanov'}

18 :
    Insurance {number=123, company='yandex', surname='ivanov'}

    Insurance {number=1005, company='google', surname='nikolaev'}



Insurance {number=1005, company='google', surname='nikolaev'}
```

```
Вывод после удаления элемента
2 :
    Insurance {number=3005, company='tesla', surname='nikolaev'}

5 :
    Insurance {number=5, company='amazon', surname='axenov'}

10 :
    Insurance {number=2005, company='netflix', surname='ivanov'}

18 :
    Insurance {number=123, company='yandex', surname='ivanov'}


Process finished with exit code 0
```