

Exemplu program Lista, tipuri generice, Iterator, Iterable prezentat la curs

Element.java

```
/**
 * @author PSG
 * @param <T> - tipul informatiei din elementele listei
 */
package listadiamant;
class Element<T> {
    private T info;
    private Element<T> urm;

    public Element<T> getUrm() {
        return urm;
    }

    public void setUrm(Element<T> urm) {
        this.urm = urm;
    }

    public Element(T info, Element<T> urm) {
        this.info = info;
        this.urm=urm;
    }
    public T getInfo(){
        return info;
    }
}
```

IteratorLst.java

```
package listadiamant;
import java.util.Iterator;
import java.util.NoSuchElementException;
/**
 * @author PSG
 * @param <T> - tipul informatiei din elementele listei
 */
class IteratorLst<T> implements Iterator<T>{
    private Element<T> pcrt;

    public IteratorLst(Element<T> prim) {
        this.pcrt = prim;
    }
    @Override
    public boolean hasNext(){
        return pcrt==null ? false:true;
    }

    @Override
    public T next() throws NoSuchElementException {
        Element<T> el= pcrt;
        if(el==null) throw new NoSuchElementException();
        pcrt=pcrt.getUrm();
        return el.getInfo();
    }
}
```

ListaGenerica.java

```
/**
 *
 * @author PSG
 * @param <T> - tipul informatiei din elementele listei
 */
package listadiamant;
import java.util.Iterator;
public class ListaGenerica<T> implements Iterable<T> {
    private Element<T> primul=null, ultimul=null;

    @Override
    public Iterator<T> iterator() {
        return new IteratorLst<>(primul);
    }

    public void insertInFata(T x){
        Element<T> primulInitial=primul;
        primul=new Element(x, primulInitial);
        if(primulInitial == null) ultimul=primul;
    }

    public void insertLaUrma(T x){
        Element<T> ultimulInitial=ultimul;
        ultimul = new Element(x, null);
        if(ultimulInitial == null) primul = ultimul;
        else
            ultimulInitial.setUrm(ultimul);
    }

    public void eliminaToateElementele(){
        primul=ultimul=null;
    }

    @Override
    public String toString(){
        StringBuilder rez=new StringBuilder("");
        for(Iterator<T> it=new IteratorLst(primul); it.hasNext();) {
            T info = it.next();
            rez.append( info==null ? "null" : info.toString() );
            if(it.hasNext())
                rez.append(", ");
        }
        rez.append('');
        return rez.toString();
    }
}
```

AplicatieListaGen.java

```
package listadiamant;
/**
 *
 * @author Decanat1
 */
public class AplicatieListaGen {

    public static void main(String[] args) {
        ListaGenerica<String> lst= new ListaGenerica<>();
```

```
lst.insertLaUrma("Bucuresti");
lst.insertInFata("Suceava");
lst.insertLaUrma("Iasi");
System.out.println("Orasele din lista:"+lst);

lst.eliminaToateElementele();

for(int i=0;i<21;i++) {
    String o=Integer.toString(i); // o=""+i
    if(i%2 !=0)
        lst.insertInFata(o);
    else
        lst.insertLaUrma(o);
}
System.out.println("Numerele din lista:"+lst);
System.out.print("Intregii din lista x10: ");

for(String el:lst){
    System.out.print((Integer.valueOf(el)*10) + ", ");
}
}
```