

NORTH SOUTH UNIVERSITY

CSE-215 : Programming Language II [Java]

Project Title : Interactive Modern Periodic Table



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About this course :

- ✓ CSE 215 – Programming Language II is designed with Java which is Object oriented programming language.
- ✓ Course Instructor : Silvia Ahmed
- ✓ Lab Instructor : Marufa Ferdousi

About project :

- ✓ This project is designed with Java GUI (Graphical User Interface). The topic is interactive modern periodic table.

Object oriented features used :

- ✓ Abstract class
- ✓ Inheritance
- ✓ Polymorphism

Integrated Development Environment used :

- ✓ Eclipse

Classes :

- ✓ Element Class --- Element.java

```
package Elements;
public abstract class Element {

    //Declaration part
    private int atomicNumber;
    private String name;
    private String symbol;
    private String electron;
    private String origin;
    private int group;
    private char block;
    // No argument constructor
    protected Element() {
        super();
        name = null;
        symbol = null;
        electron = null;
        origin = null;
    }
    // Constructor with all data fields
```

```
protected Element int atomicNumber, String name, String symbol, String
electron, String origin, int group, char block {

    super();
    this.atomicNumber = atomicNumber;
    this.name = name;
    this.symbol = symbol;
    this.electron = electron;
    this.origin = origin;
    this.group = group;
    this.block = block;

//Getters and Setters for Atomic Number
public int getAtomicNumber() {
    return atomicNumber;
}

public void setAtomicNumber int atomicNumber) {
    this.atomicNumber = atomicNumber;
}

//Getters and Setters for Name
public String getName() {
    return name;
}

public void setName String name) {
    this.name = name;
}

//Getters and Setters for Symbol
public String getSymbol() {
    return symbol;
}

public void setSymbol String symbol) {
    this.symbol = symbol;
}

//Getters and Setters for Electron
public String getElectron() {
    return electron;
}

public void setElectron String electron) {
    this.electron = electron;
}

//Getters and Setters for Origin name
public String getOrigin() {
    return origin;
}

public void setOrigin String origin) {
    this.origin = origin;
}

//Getters and Setters for Group
public int getGroup() {
    return group;
}
```

```

    }
    public void setGroup int group) {
        this.group = group;
    }
    //Getters and Setters for Block
    public char getBlock() {
        return block;
    }
    public void setBlock char block) {
        this.block = block;
    }
    //Abstract methods
    public abstract String properties();
    public abstract String behaviour();

    //To String method with definition of elements
    @Override
    public String toString() {
        return "Atomic Number ----- " + atomicNumber + "," +
            "\nName ----- " + name + "," +
            "\nSymbol ----- " + symbol + "," +
            "\nElectron Configuration ----- " + electron + "," +
            "\nOrigin of Name ----- " + origin + "," +
            "\nGroup ----- " + group + "," +
            "\nBlock ----- " + block + ",";
    }
}

```

✓ Actinide Class ---Actinide.java

```

package Elements;

public class Actinide extends Element {
    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public Actinide() {
        super();
    }

    //Constructor with all data fields
    public Actinide(double atomicWeight, double meltingPoint, double boilingPoint,
double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }
}

```

```
//Constructor with all properties
public Actinide int atomicNumber, String name, String symbol, String
electron, String origin, int group char block, double atomicWeight, double
meltingPoint, double boilingPoint, double density) {

    super atomicNumber, name, symbol, electron, origin, group,
block);
    this.atomicWeight = atomicWeight;
    this.meltingPoint = meltingPoint;
    this.boilingPoint = boilingPoint;
    this.density = density;
}

//Getters and Setters for Atomic Weight
public double getAtomicWeight() {
    return atomicWeight;
}

public void setAtomicWeight double atomicWeight {
    this.atomicWeight = atomicWeight;
}

//Getters and Setters for Melting point
public double getMeltingPoint() {
    return meltingPoint;
}

public void setMeltingPoint double meltingPoint) {
    this.meltingPoint = meltingPoint;
}

//Getters and Setters for Boiling point
public double getBoilingPoint() {
    return boilingPoint;
}

public void setBoilingPoint double boilingPoint) {
    this.boilingPoint = boilingPoint;
}

//Getters and Setters for Density
public double getDensity() {
    return density;
}

public void setDensity double density) {
    this.density = density;
}

//Implementing abstract methods
@Override
public String properties() {

    return "Properties : Are radioactive. The metals tarnish readily in air."
        + "Actinides are very dense metals with distinctive
structures.";

}

@Override
```

```

public String behaviour() {
    return "Behaviour : All of these elements are highly electropositive.";
}

@Override
public String toString() {
    return super.toString() +
        "\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+"," +
        "\nMelting Point ----- " +meltingPoint+ " Kelvin"+"," +
        "\nBoiling Point ----- " +boilingPoint+" g/cm^3" +"," +"\n\n" +
        +properties() +"," +"\n\n" +behaviour();
}

}

```

✓ AlkaliMetal Class ---AlkaliMetal.java

```

package Elements;
public class AlkaliMetal extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public AlkaliMetal() {
        super();
    }

    //Constructor with all data fields
    public AlkaliMetal(double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public AlkaliMetal(int atomicNumber, String name, String symbol, String
electron, String origin, int group,
        char block, double atomicWeight, double meltingPoint, double boilingPoint,
double density) {
        super(atomicNumber, name, symbol, electron, origin, group, block);
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight() {

```

```

        return atomicWeight;
    }

    public void setAtomicWeight double atomicWeight {
        this.atomicWeight = atomicWeight;
    }

    //Getters and Setters for Melting point
    public double getMeltingPoint() {
        return meltingPoint;
    }

    public void setMeltingPoint double meltingPoint) {
        this.meltingPoint = meltingPoint;
    }

    //Getters and Setters for Boiling point
    public double getBoilingPoint() {
        return boilingPoint;
    }

    public void setBoilingPoint double boilingPoint) {
        this.boilingPoint = boilingPoint;
    }

    //Getters and Setters for Density
    public double getDensity() {
        return density;
    }

    public void setDensity double density) {
        this.density = density;
    }

    //Implementing abstract methods
    @Override
    public String properties() {

        return "Properties : Found in column 1A of the periodic table."
            + " Have one electron in their outermost layer of electrons."
            + " Easily ionized. Silvery, soft, and not dense. Low melting
points and Incredibly reactive.";
    }

    @Override
    public String behaviour() {
        return "Behaviour : All the alkali metals readily lose their one outermost "
            + "electrons to form cations with a 1+ charge ";
    }

    @Override
    public String toString() {
        return super.toString() +
            "\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
            "\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
            "\nBoiling Point ----- " +boilingPoint+" g/cm^3" +","+"\\n\\n"
            +properties() +"\\n\\n" +behaviour();
    }
}

```

✓ AlkalineEarthMetals Class ---AlkalineEarthMetals.java

```
package Elements;
public class AlkalineEarthMetals extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public AlkalineEarthMetals () {
        super();
    }

    //Constructor with all data fields
    public AlkalineEarthMetals double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public AlkalineEarthMetals int atomicNumber, String name, String symbol,
String electron, String origin, int group,
        char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {

        super atomicNumber, name, symbol, electron, origin, group,
block);
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight () {
        return atomicWeight;
    }

    public void setAtomicWeight double atomicWeight) {
        this.atomicWeight = atomicWeight;
    }

    //Getters and Setters for Melting point
    public double getMeltingPoint () {
        return meltingPoint;
    }

    public void setMeltingPoint double meltingPoint) {
        this.meltingPoint = meltingPoint;
    }
}
```

```

    }

    //Getters and Setters for Boiling point
    public double getBoilingPoint() {
        return boilingPoint;
    }

    public void setBoilingPoint double boilingPoint) {
        this.boilingPoint = boilingPoint;
    }

    //Getters and Setters for Density
    public double getDensity() { return density;
    public void setDensity double density) {
        this.density = density;
    }

    //Implementing abstract methods
    @Override
    public String properties() {
        return "Properties : Shiny and silvery-white. Somewhat reactive metals at standard temperature and pressure. "+"Readily lose their two outermost electrons to form cations with a 2+ charge.\r\n" + "low densities. Low melting and Boiling points";
    }

    @Override
    public String behaviour() {
        return "Behaviour : All the alkaline earth metals readily lose their two outermost "+"electrons to form cations with a 2+ charge ";
    }

    @Override
    public String toString() {
        return super.toString() +
            "\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
            "\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
            "\nBoiling Point ----- " +boilingPoint+ " g/cm^3" +","+"\\n\\n" +
            +properties()+"+" "\\n\\n" +behaviour();
    }
}

```

✓ BasicMetals Class ---BasicMetals.java

```

package Elements;
public class BasicMetals extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public BasicMetals () {
        super();
    }

    //Constructor with all data fields

```

```
    public BasicMetals double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
    super();
    this.atomicWeight = atomicWeight;
    this.meltingPoint = meltingPoint;
    this.boilingPoint = boilingPoint;
    this.density = density;
}

//Constructor with all properties
public BasicMetals int atomicNumber, String name, String symbol, String
electron, String origin, int group,
        char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {
    super atomicNumber, name, symbol, electron, origin, group,
block);
    this.atomicWeight = atomicWeight;
    this.meltingPoint = meltingPoint;
    this.boilingPoint = boilingPoint;
    this.density = density;
}

//Getters and Setters for Atomic Weight
public double getAtomicWeight() {
    return atomicWeight;
}

public void setAtomicWeight double atomicWeight) {
    this.atomicWeight = atomicWeight;
}

//Getters and Setters for Melting point
public double getMeltingPoint() {
    return meltingPoint;
}

public void setMeltingPoint double meltingPoint) {
    this.meltingPoint = meltingPoint;
}

//Getters and Setters for Boiling point
public double getBoilingPoint() {
    return boilingPoint;
}

public void setBoilingPoint double boilingPoint) {
    this.boilingPoint = boilingPoint;
}

//Getters and Setters for Density
public double getDensity() {
    return density;
}

public void setDensity double density) {
    this.density = density;
}
```

```

//Implementing abstract methods
@Override
public String properties() {
    return "Properties : Shiny. High melting point. High density (heavy for their size)" +
           " Malleable (can be hammered). Usually solid at room
temperature (an exception is mercury).";
}

@Override
public String behaviour() {
    return "Behaviour : Good conductors of heat and electricity.";
}

@Override
public String toString() {
    return super.toString() +
           "\nAtomic Weight ----- " + atomicWeight + " Kelvin"+"," +
           "\nMelting Point ----- " + meltingPoint + " Kelvin"+"," +
           "\nBoiling Point ----- " + boilingPoint + " g/cm^3" +"," +
           "+properties()"+"," + "\n\n" +behaviour();
}

```

✓ Halogen Class --- Halogen.java

```

package Elements;
public class Halogen extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public Halogen() {
        super();
    }

    //Constructor with all data fields
    public Halogen(double atomicWeight, double meltingPoint, double boilingPoint,
double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public Halogen(int atomicNumber, String name, String symbol, String
electron, String origin, int group,
                char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {

```

```
super atomicNumber, name, symbol, electron, origin, group,
block);
this.atomicWeight = atomicWeight;
this.meltingPoint = meltingPoint;
this.boilingPoint = boilingPoint;
this.density = density;

//Getters and Setters for Atomic Weight
public double getAtomicWeight() {
    return atomicWeight;
}

public void setAtomicWeight double atomicWeight {
    this.atomicWeight = atomicWeight;
}

//Getters and Setters for Melting point
public double getMeltingPoint() {
    return meltingPoint;
}

public void setMeltingPoint double meltingPoint) {
    this.meltingPoint = meltingPoint;
}

//Getters and Setters for Boiling point
public double getBoilingPoint() {
    return boilingPoint;
}

public void setBoilingPoint double boilingPoint) {
    this.boilingPoint = boilingPoint;
}

//Getters and Setters for Density
public double getDensity() {
    return density;
}

public void setDensity double density) {
    this.density = density;
}

//Implementing abstract methods
@Override
public String properties() {

    return "Properties : Have relatively low melting and boiling points. Exist in
all three classical states of matter"
        + "- solid, liquid and gas. ";
}

@Override
public String behaviour() {
    return "Behaviour : Electronegative ";
}

@Override
public String toString() {
    return super.toString() +
```

```

        +"\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
        +"\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
        +"\nBoiling Point ----- " +boilingPoint+" g/cm^3" +","+"\\n\\n"
        +properties() +"," + "\\n\\n" +behaviour());
    }
}

```

✓ Lanthenide Class ---Lanthenide.java

```

package Elements;
public class Lanthenide extends Element {
    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public Lanthenide () {
        super();
    }

    //Constructor with all data fields
    public Lanthenide (double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public Lanthenide int atomicNumber, String name, String symbol, String
electron, String origin, int group,
                           char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {

        super atomicNumber, name, symbol, electron, origin, group,
block);
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight () {
        return atomicWeight;
    }

    public void setAtomicWeight double atomicWeight {
        this.atomicWeight = atomicWeight;
    }
}

```

```

    }

    //Getters and Setters for Melting point
    public double getMeltingPoint() {
        return meltingPoint;
    }

    public void setMeltingPoint double meltingPoint) {
        this.meltingPoint = meltingPoint;
    }

    //Getters and Setters for Boiling point
    public double getBoilingPoint() {
        return boilingPoint;
    }

    public void setBoilingPoint double boilingPoint) {
        this.boilingPoint = boilingPoint;
    }

    //Getters and Setters for Density
    public double getDensity() {
        return density;
    }

    public void setDensity double density) {
        this.density = density;
    }

    //Implementing abstract methods
    @Override
    public String properties() {

        return "Properties : Silvery-white metals that tarnish when exposed to air,  

        forming their oxides. "+ "Relatively soft metals. High melting points and boiling  

        points.";
    }

    @Override
    public String behaviour() {

        return "Behaviour : All of these elements have one valence electron in  

        the 5d shell. ";
    }

    @Override
    public String toString() {
        return super.toString() +
            "\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
            "\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
            "\nBoiling Point ----- " +boilingPoint+" g/cm^3" +","+"\\n\\n"
            +properties() +"\\n" +behaviour();
    }
}

```

✓ Noble Class ---Noble.java

package Elements;

```
public class NobleGas extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public NobleGas () {
        super();
    }

    //Constructor with all data fields
    public NobleGas (double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public NobleGas (int atomicNumber, String name, String symbol, String
electron, String origin, int group,
                    char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {

        super(atomicNumber, name, symbol, electron, origin, group,
block);
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight () {
        return atomicWeight;
    }

    public void setAtomicWeight (double atomicWeight) {
        this.atomicWeight = atomicWeight;
    }

    //Getters and Setters for Melting point
    public double getMeltingPoint () {
        return meltingPoint;
    }

    public void setMeltingPoint (double meltingPoint) {
        this.meltingPoint = meltingPoint;
    }

    //Getters and Setters for Boiling point
    public double getBoilingPoint () {
        return boilingPoint;
    }
}
```

```

    }

    public void setBoilingPoint double boilingPoint) {
        this.boilingPoint = boilingPoint;
    }

    //Getters and Setters for Density
    public double getDensity() {
        return density;
    }

    public void setDensity double density) {
        this.density = density;
    }

    //Implementing abstract methods
    @Override
    public String properties() {

        return "Properties : As all noble gases conduct electricity, fluoresce, are
odorless and colorless. ";
    }

    @Override
    public String behaviour() {
        return "Behaviour : Low chameical reactivity. ";
    }

    @Override
    public String toString() {
        return super.toString() +
            "\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
            "\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
            "\nBoiling Point ----- " +boilingPoint+" g/cm^3" +","+"\\n\\n"
            +properties() +"\\n\\n" +behaviour();
    }
}

```

✓ NonMetals Class ---NonMetals.java

```

package Elements;
public class NonMetals extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public NonMetals () {
        super();
    }

    //Constructor with all data fields
    public NonMetals double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
    }
}

```

```
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;

    //Constructor with all properties
    public NonMetals int atomicNumber, String name, String symbol, String
electron, String origin, int group,
                           char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {

        super atomicNumber, name, symbol, electron, origin, group,
block);
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight(){
        return atomicWeight;
    }

    public void setAtomicWeight double atomicWeight {
        this.atomicWeight = atomicWeight;
    }

    //Getters and Setters for Melting point
    public double getMeltingPoint(){
        return meltingPoint;
    }

    public void setMeltingPoint double meltingPoint){
        this.meltingPoint = meltingPoint;
    }

    //Getters and Setters for Boiling point
    public double getBoilingPoint(){
        return boilingPoint;
    }

    public void setBoilingPoint double boilingPoint){
        this.boilingPoint = boilingPoint;
    }

    //Getters and Setters for Density
    public double getDensity(){
        return density;
    }

    public void setDensity double density){
        this.density = density;
    }

    //Implementing abstract methods
    @Override
    public String properties){
```

```

        return "Properties : Nonmetals have high ionization energies and
electronegativities." + "Solid nonmetals are generally brittle, with little or no metallic
luster. "
        + "Most nonmetals have the ability to gain electrons easily.";
    }

    @Override
    public String behaviour() {
        return "Behaviour : Generally poor conductors of heat and electricity. ";
    }

    @Override
    public String toString() {
        return super.toString() +
            "\nAtomic Weight ----- " + atomicWeight + " Kelvin"+"," +
            "\nMelting Point ----- " + meltingPoint + " Kelvin"+"," +
            "\nBoiling Point ----- " + boilingPoint + " g/cm^3" +"," +"\n\n" +
            +properties() +"," + "\n\n" +behaviour();
    }
}

```

✓ SemiMetals Class --- SemiMetals.java

```

package Elements;
public class SemiMetals extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public SemiMetals() {
        super();
    }

    //Constructor with all data fields
    public SemiMetals(double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public SemiMetals(int atomicNumber, String name, String symbol, String
electron, String origin, int group,
                    char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {
        super(atomicNumber, name, symbol, electron, origin, group,
block);
    }
}

```

```
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;

    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight() {
        return atomicWeight;
    }

    public void setAtomicWeight double atomicWeight {
        this.atomicWeight = atomicWeight;
    }

    //Getters and Setters for Melting point
    public double getMeltingPoint() {
        return meltingPoint;
    }

    public void setMeltingPoint double meltingPoint) {
        this.meltingPoint = meltingPoint;
    }

    //Getters and Setters for Boiling point
    public double getBoilingPoint() {
        return boilingPoint;
    }

    public void setBoilingPoint double boilingPoint) {
        this.boilingPoint = boilingPoint;
    }

    //Getters and Setters for Density
    public double getDensity() {
        return density;
    }

    public void setDensity double density) {
        this.density = density;
    }

    //Implementing abstract methods
    @Override
    public String properties() {

        return "Properties : Dull or Shiny. High melting point. High density (heavy  
for their size)+"+ "Usually malleable (can be hammered). Usually solid at room  
temperature.";

    }

    @Override
    public String behaviour() {

        return "Behaviour : Good semiconductors of heat and electricity but less  
than metals. ";

    }

    @Override
    public String toString() {
        return super.toString() +
```

```
"\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
"\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
"\nBoiling Point ----- " +boilingPoint+" g/cm^3" +","+"\\n\\n"
+properties()"+","+"\\n\\n" +behaviour());
```

✓ TransitionMetals Class --- TransitionMetals.java

```
package Elements;
public class TransitionMetals extends Element {

    private double atomicWeight;
    private double meltingPoint;
    private double boilingPoint;
    private double density;

    //No argument constructor
    public TransitionMetals () {
        super();
    }

    //Constructor with all data fields
    public TransitionMetals double atomicWeight, double meltingPoint, double
boilingPoint, double density) {
        super();
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Constructor with all properties
    public TransitionMetals int atomicNumber, String name, String symbol,
String electron, String origin, int group,
                    char block, double atomicWeight, double meltingPoint,
double boilingPoint, double density) {

        super atomicNumber, name, symbol, electron, origin, group,
block);
        this.atomicWeight = atomicWeight;
        this.meltingPoint = meltingPoint;
        this.boilingPoint = boilingPoint;
        this.density = density;
    }

    //Getters and Setters for Atomic Weight
    public double getAtomicWeight () {
        return atomicWeight;
    }

    public void setAtomicWeight double atomicWeight {
        this.atomicWeight = atomicWeight;
    }

    //Getters and Setters for Melting point
```

```

public double getMeltingPoint() {
    return meltingPoint;
}

public void setMeltingPoint double meltingPoint) {
    this.meltingPoint = meltingPoint;
}

//Getters and Setters for Boiling point
public double getBoilingPoint() {
    return boilingPoint;
}

public void setBoilingPoint double boilingPoint) {
    this.boilingPoint = boilingPoint;
}

//Getters and Setters for Density
public double getDensity() {
    return density;
}

public void setDensity double density) {
    this.density = density;
}

//Implementing abstract methods
@Override
public String properties() {

    return "Properties : Have large charge/radius ratio. Are hard and have
high densities"
        + " Have high melting and boiling points. Form compounds
which are often paramagnetic." + "Form coloured ions and compounds",
}

@Override
public String behaviour() {

    return "Behaviour : All transitional metals react with halogens to form a
variety of halides "
        + "ranging in oxidation state from 1+ to 6+ ";
}

@Override
public String toString() {
    return super.toString() +
        "\nAtomic Weight ----- " +atomicWeight+ " Kelvin"+","+
        "\nMelting Point ----- " +meltingPoint+ " Kelvin"+","+
        "\nBoiling Point ----- " +boilingPoint+ " g/cm^3" +","+"\\n\\n"
        +properties() +"\n" +behaviour();
}

```

✓ ArrayElements Class --- ArrayElements.java

```

//initializing
package Elements;
import java.util.ArrayList;

```

```

public class ArrayElements {
    private ArrayList<Element> list = new ArrayList<>();

    public ArrayElements() {
        //1
        list.add(new NonMetals(1, "Hydrogen", "H", "1s1", "the Greek 'hydro' and 'genes' meaning water-forming", 1, 's', 1.008, 14.01, 20.28, 0.00008988));
        //2
        list.add(new NobleGas(2, "Helium", "He", "1s2", "the Greek 'helios' meaning sun", 18, 'p', 4.002602, 0.95, 4.22, .0001785));
        //3
        list.add(new AlkaliMetal(3, "Lithium", "Li", "[He] 2s1", "the Greek 'lithos' meaning stone", 1, 's', 6.94, 453.69, 1560, 0.534));
        //4
        list.add(new AlkalineEarthMetals(4, "Beryllium", "Be", "[He] 2s2", "the Greek name for beryl, 'beryllo'", 2, 's', 9.012182, 1560, 2742, 1.85));
        //5
        list.add(new SemiMetals(5, "Boron", "B", "[He] 2s2 2p1", "the Arabic 'buraq', which was the name for borax", 13, 'p', 10.81, 2349, 4200, 2.34));
        //6
        list.add(new NonMetals(6, "Carbon", "C", "[He] 2s2 2p2", "the Latin 'carbo', meaning charcoal", 14, 'p', 12.011, 3800, 4300, 2.267));
        //7
        list.add(new NonMetals(7, "Nitrogen", "N", "[He] 2s2 2p3", "the Greek 'nitron' and 'genes' meaning nitre-forming", 15, 'p', 14.007, 63.15, 77.36, 0.0012506));
        //8
        list.add(new NonMetals(8, "Oxygen", "O", "[He] 2s2 2p4", "the Greek 'oxy' and 'genes' meaning acid-forming", 16, 'p', 15.999, 54.36, 90.20, 0.001429));
        //9
        list.add(new Halogen(9, "Fluorine", "F", "[He] 2s2 2p5", "the Latin 'fluere', meaning to flow", 17, 'p', 18.9984032, 53.53, 85.03, 0.001696));
        //10
        list.add(new NobleGas(10, "Neon", "Ne", "[He] 2s2 2p6", "the Greek 'neos', meaning new", 18, 'p', 20.1797, 24.56, 27.07, 0.0008999));
        //11
        list.add(new AlkaliMetal(11, "Sodium", "Na", "[Ne] 3s1", "the English word soda", 1, 's', 22.98976928, 370.87, 1156, 0.971));
        //12
        list.add(new AlkalineEarthMetals(12, "Magnesium", "Mg", "[Ne] 3s2", "Magnesia, a district of Eastern Thessaly in Greece", 2, 's', 24.305, 923, 1363, 1.738));
        //13
        list.add(new BasicMetals(13, "Aluminium", "Al", "[Ne] 3s2 3p1", "Alumen (Latin, meaning bitter salt)", 13, 'p', 26.9815386, 933.47, 2792, 2.698));
        //14
        list.add(new SemiMetals(14, "Silicon", "Si", "[Ne] 3s2 3p2", "the Latin 'silex' or 'silicis', meaning flint", 14, 'p', 28.085, 1687, 3538, 2.3296));
        //15
        list.add(new NonMetals(15, "Phosphorus", "P", "[Ne] 3s2 3p3", "the Greek 'phosphoros', meaning bringer of light", 15, 'p', 30.973762, 317.30, 550, 1.82));
    }
}

```

```

//16
list add new NonMetals 16, "Sulfur", "S", "[Ne] 3s2 3p4", "Either from the Sanskrit
'sulvere', or the Latin 'sulfurium', both names for sulfur", 16, 'p' 32.06, 388.36, 717.87,
2.067);
//17
list add new Halogen 17, "Chlorine", "Cl", "[Ne] 3s2 3p5", "the Greek 'chloros', meaning
greenish yellow", 17, 'p', 35.45, 171.6, 239.11, 0.003214);
//18
list add new NobleGas 18, "Argon", "Ar", "[Ne] 3s2 3p6", "the Greek, 'argos', meaning
idle", 18, 'p' 39.948, 83.80, 87.30, 0.0017837);
//19
list add new AlkaliMetal 19, "Potassium", "K", "[Ar] 4s1", "the English word potash", 1, 's',
39.0983, 336.53, 1032, 0.862);
//20
list add new AlkalineEarthMetals 20, "Calcium", "Ca", "[Ar] 4s2", "the Latin 'calx' meaning
lime", 2, 's' 40.078, 1115, 1757, 1.54);
//21
list add new TransitionMetals 21, "Scandium", "Sc", "[Ar] 3d1 4s2", "Scandinavia", 3,
'd' 44.955912, 1814, 3109, 2.989);
//22
list add new TransitionMetals 22, "Titanium", "Ti", "[Ar] 3d2 4s2", "Titans, the sons of the
Earth goddess of Greek mythology", 4, 'd' 47.867, 1941, 3560, 4.54);
//23
list add new TransitionMetals 23, "Vanadium", "V", "[Ar] 3d3 4s2", "Vanadis, an old Norse
name for the Scandinavian goddess Freyja", 5, 'd' 50.9415, 2183, 3680, 6.11);
//24
list add new TransitionMetals 24, "Chromium", "Cr", "[Ar] 3d5 4s1", "the Greek 'chroma',
meaning colour", 6, 'd' 51.9961, 2180, 2944, 7.15);
//25
list add new TransitionMetals 25, "Manganese", "Mn", "[Ar] 3d5 4s2", "from the black
magnesium oxide, 'magnesia nigra'", 7, 'd' 54.938045, 1519, 2334, 7.44);
//26
add new TransitionMetals 26, "Iron", "Fe", "[Ar] 3d6 4s2", "the Anglo-Saxon name
iren", 8, 'd' 55.845, 1811, 3134, 7.874);
//27
list add new TransitionMetals 27, "Cobalt", "Co", "[Ar] 3d7 4s2", "the German word
'kobald', meaning goblin", 9, 'd' 58.933195, 1768, 3200, 8.86);
//28
list add new TransitionMetals 28, "Nickel", "Ni", "[Ar] 3d8 4s2", "the shortened of the
German 'kupfernickel' meaning St. Nicholas's copper", 10, 'd' 58.6934, 1728, 3186,
8.912);
//29
list add new TransitionMetals 29, "Copper", "Cu", "[Ar] 3d10 4s1", "derived from the
Latin 'Cyprum aes', meaning a metal from Cyprus", 11, 'd' 63.546, 1357.77, 2835, 8.96
);
//30
list add new TransitionMetals 30, "Zinc", "Zn", "[Ar] 3d10 4s2", "the German, 'zinc',
meaning stone", 12, 'd' 65.38, 692.88, 1180, 7.134);
//31

```

```

list add new BasicMetals 31, "Gallium", "Ga", "[Ar] 3d10 4s2 4p1", "France", 13,
'p' 69.723, 302.9146, 2477, 5.907 );
//32
list add new SemiMetals 32, "Germanium", "Ge", "[Ar] 3d10 4s2
4p2", "Germany", 14, 'p' 72.630, 1211.40, 3106, 5.323);
//33
list add new SemiMetals 33, "Arsenic", "As", "[Ar] 3d10 4s2 4p3", "the Greek name
'arsenikon' for the yellow pigment orpiment", 15, 'p' 74.92160, 1090.887, 5.776);
//34
list add new NonMetals 34, "Selenium", "Se", "[Ar] 3d10 4s2 4p4",
"Moon", 16, 'p' 78.96, 453, 958, 4.809 );
//35
list add new Halogen 35, "Bromine", "Br", "[Ar] 3d10 4s2 4p5 ", "the Greek 'bromos'
meaning stench", 17, 'p' 79.904, 265.8, 332.0, 3.122 );
//36
list add new NobleGas 36, "Krypton", "Kr", "[Ar] 3d10 4s2 4p6", "the Greek 'kryptos',
meaning hidden", 18, 'p' 83.798, 115.79, 119.93, 0.003733 );
//37
list add new AlkaliMetal 37, "Rubidium", "Rb", "[Kr] 5s1", "the Latin 'rubidius', meaning
deepest red", 1, 's' 85.4678, 312.46, 961, 1.532 );
//38
list add new AlkalineEarthMetals 38, "Strontium", "Sr", "[Kr] 5s2", "Strontian, a small town
in Scotland", 2, 's' 87.62, 1050, 1655, 2.64 );
//39
list add new TransitionMetals 39, "Yttrium", "Y", "[Kr] 4d1 5s2", "Ytterby,
Sweden", 3, 'd' 88.90585, 1799, 3609, 4.469 );
//40
list add new TransitionMetals 40, "Zirconium", "Zr", "[Kr] 4d2 5s2", "the Persian 'zargun',
meaning gold coloured", 4, 'd' 91.224, 2128, 4682, 6.506 );
//41
list add new TransitionMetals 41, "Niobium", "Nb", "[Kr] 4d4 5s1", "Niobe, daughter of
king Tantalus from Greek mythology", 5, 'd' 92.90638, 2750, 5017, 8.57 );
//42
list add new TransitionMetals 42, "Molybdenum", "Mo", "[Kr] 4d5 5s1", "the Greek
'molybdos' meaning lead", 6, 'd' 95.96, 2896, 4912, 10.22 );
//43
list add new TransitionMetals 43, "Technetium", "Tc", "[Kr] 4d5 5s2", "the Greek
'tekhnatos' meaning artificial", 7, 'd' 98, 2430, 4538, 11.5 );
//44
list add new TransitionMetals 44, "Ruthenium", "Ru", "[Kr] 4d7 5s1", "Russia", 8,
'd' 101.07, 2607, 4423, 12.37 );
//45
list add new TransitionMetals 45, "Rhodium", "Rh", "[Kr] 4d8 5s1", "the Greek 'rhodon',
meaning rose coloured", 9, 'd' 102.90550, 2237, 3968, 12.41 );
//46
list add new TransitionMetals 46, "Palladium", "Pd", "[Kr] 4d10", "the then recently-
discovered asteroid Pallas, considered a planet at the time", 10,
'd' 106.42, 1828.05, 2963, 12.02 );
//47

```

```
list add new TransitionMetals 47, "Silver", "Ag", "[Kr] 4d10 5s1", "the Anglo-Saxon name  
siolfur", 11, 'd', 107.8682, 1234.93, 2435, 10.501);  
//48  
list add new TransitionMetals 48, "Cadmium", "Cd", "[Kr] 4d10 5s2", "the Latin name for  
the mineral calmine, 'cadmia'", 12, 'd', 112.411, 594.22, 1040, 8.69);  
//49  
list add new BasicMetals 49, "Indium", "In", "[Kr] 4d10 5s2 5p1", "the Latin 'indicum',  
meaning violet or indigo", 13, 'p', 114.818, 429.75, 2345, 7.31);  
//50  
list add new BasicMetals 50, "Tin", "Sn", "[Kr] 4d10 5s2 5p2", "the Anglo-Saxon word  
tin", 14, 'p', 118.710, 505.08, 2875, 7.287);  
//51  
list add new SemiMetals 51, "Antimony", "Sb", "[Kr] 4d10 5s2 5p3", "the Greek 'anti -  
monos', meaning not alone", 15, 'p', 121.760, 903.78, 1860, 6.685);  
//52  
list add new SemiMetals 52, "Tellurium", "Te", "[Kr] 4d10 5s2 5p4", "Earth, the third  
planet on solar system", 16, 'p', 127.60, 386.85, 457.4, 6.232);  
//53  
list add new Halogen 53, "Iodine", "I", "[Kr] 4d10 5s2 5p5", "the Greek 'iodes' meaning  
violet", 17, 'p', 126.90447, 161.4, 165.03, 4.93);  
//54  
list add new NobleGas 54, "Xenon", "Xe", "[Kr] 4d10 5s2 5p6", "the Greek 'xenos'  
meaning stranger", 18, 'p', 131.293, 161.4, 165.03, 0.005887);  
//55  
list add new AlkaliMetal 55, "Caesium", "Cs", "[Xe]6s1", "the Latin 'caesius', meaning sky  
blue", 1, 's', 132.9054519, 301.59, 944, 1.873);  
//56  
list add new AlkalineEarthMetals 56, "Barium", "Ba", "[Xe]6s2", "the Greek 'barys',  
meaning heavy", 2, 's', 137.327, 1000, 2170, 3.594);  
//57  
list add new Lanthenide 57, "Lanthanum", "La", "[Xe]5d1 6s2", "the Greek 'lanthanein',  
meaning to lie hidden", 3, 'd', 138.90547, 1193, 3737, 6.145);  
//58  
list add new Lanthenide 58, "Cerium", "Ce", "[Xe]4f1 5d1 6s2", "Ceres, the Roman God  
of agriculture", 4, 'f', 140.90765, 1068, 3716, 6.77);  
//59  
list add new Lanthenide 59, "Praseodymium", "Pr", "[Xe]4f3 6s2", "the Greek 'prasios'  
didymos' meaning green twin", 5, 'f', 140.90765, 1208, 3793, 6.773);  
//60  
list add new Lanthenide 60, "Neodymium", "Nd", "[Xe]4f4 6s2", "the Greek 'neos'  
didymos' meaning new twin", 6, 'f', 144.242, 1297, 3347, 7.007);  
//61  
list add new Lanthenide 61, "Promethium", "Pm", "[Xe]4f5 6s2", "Prometheus of Greek  
mythology who stole fire from the Gods and gave it to humans", 7, 'f', 145, 1315,  
3273, 7.26);  
//62  
list add new Lanthenide 62, "Samarium", "Sm", "[Xe]4f6 6s2", "Samarskite, the name of  
the mineral from which it was first isolated", 8, 'f', 150.36, 1345, 2067, 7.52);  
//63
```

```
list add new Lanthenide 63, "Europium", "Eu", "[Xe]4f7 6s2", "Europe", 9, 'f', 151.964,  
1099, 1802, 5.243);  
//64  
list add new Lanthenide 64, "Gadolinium", "Gd", "[Xe]4f7 5d1 6s2", "Johan Gadolin,  
chemist, physicist and mineralogist", 10, 'f', 157.25, 1585, 3546, 7.895);  
//65  
list add new Lanthenide 65, "Terbium", "Tb", "[Xe]4f9 6s2", "Ytterby, Sweden", 11, 'f',  
158.92535, 1629, 3503, 8.229 );  
//66  
list add new Lanthenide 66, "Dysprosium", "Dy", "[Xe]4f10 6s2", "the Greek  
'dysprositos', meaning hard to get", 12, 'f', 162.500, 1680, 2840, 8.55);  
//67  
list add new Lanthenide 67, "Holmium", "Ho", "[Xe]4f11 6s2", "Stockholm, Sweden", 13 ,  
'f', 164.93032, 1734, 2993, 8.795);  
//68  
list add new Lanthenide 68, "Erbium", "Er", "[Xe]4f12 6s2", "Ytterby, Sweden", 14 , 'f',  
167.259, 1802, 3141, 9.066);  
//69  
list add new Lanthenide 69, "Thulium", "Tm", "[Xe]4f13 6s2", "Thule, the ancient name  
for Scandinavia", 15 , 'f', 168.93421, 1818, 2223, 9.321);  
//70  
list add new Lanthenide 70, "Ytterbium", "Yb", "[Xe]4f14 6s2", "Ytterby, Sweden", 16, 'f',  
173.054, 1097, 1469, 6.965);  
//71  
list add new Lanthenide 71, "Lutetium", "Lu", "[Xe]4f14 5d1 6s2", "Paris, France", 17 , 'f',  
174.9668, 1925, 3675, 9.84);  
//72  
list add new TransitionMetals 72, "Hafnium", "Hf", "[Xe]4f14 5d2 6s2", "Copenhagen,  
Denmark", 4 , 'd', 178.49, 2506, 4876, 13.31);  
//73  
list add new TransitionMetals 73, "Tantalum", "Ta", "[Xe]4f14 5d3 6s2", "King Tantalus,  
father of Niobe from Greek mythology", 5 , 'd', 180.94788, 3290, 5731, 16.654);  
//74  
list add new TransitionMetals 74, "Tungsten", "W", "[Xe]4f14 5d4 6s2", "the Swedish  
'tung sten' meaning heavy stone", 6 , 'd', 183.84, 3695, 5828, 19.25);  
//75  
list add new TransitionMetals 75, "Rhenium", "Re", "[Xe]4f14 5d5 6s2", "Rhine, a  
river", 7 , 'd', 186.207, 3459, 5869, 21.02);  
//76  
list add new TransitionMetals 76, "Osmium", "Os", "[Xe]4f14 5d6 6s2", "the Greek  
'osme', meaning smell", 8 , 'd', 190.23, 3306, 5285, 22.61);  
//77  
list add new TransitionMetals 77, "Iridium", "Ir", "[Xe]4f14 5d7 6s2", "Iris, the Greek  
goddess of the rainbow", 9 , 'd', 192.217, 2719, 4701, 22.56);  
//78  
list add new TransitionMetals 78, "Platinum", "Pt", "[Xe]4f14 5d9 6s1", "the Spanish  
'platina', meaning little silver", 10 , 'd', 195.084, 2041.4, 4098, 21.46);  
//79  
list add new TransitionMetals 79, "Gold", "Au", "[Xe]4f14 5d10 6s1", "the Anglo-Saxon  
word gold", 11 , 'd', 196.966569, 1337.33, 3129, 19.282);
```

```
//80
list add new TransitionMetals 80, "Mercury", "Hg", "[Xe]4f14 5d10 6s2", "Mercury, the
first planet in the Solar System", 12, 'd', 200.592, 234.43, 629.88, 13.5336);
//81
list add new BasicMetals 81, "Thallium", "Tl", "[Xe]4f14 5d10 6s2 6p1", "the Greek
'thallos', meaning a green twig", 13, 'p', 204.38, 577, 1746, 11.85);
//82
list add new BasicMetals 82, "Lead", "Pb", "[Xe]4f14 5d10 6s2 6p2", "the Anglo-Saxon
lead", 14, 'p', 207.2, 600.61, 2022, 11.342);
//83
list add new BasicMetals 83, "Bismuth", "Bi", "[Xe]4f14 5d10 6s2 6p3", "the German
'Bisemutum' a corruption of 'Weisse Masse' meaning white mass", 15, 'p', 208.98040,
544.7, 1837, 9.807);
//84
list add new SemiMetals 84, "Polonium", "Po", "[Xe]4f14 5d10 6s2 6p4", "Poland, the
native country of Marie Curie, who first isolated the element", 16, 'p', 209, 527, 1235,
9.32);
//85
list add new Halogen 85, "Astatine", "At", "[Xe]4f14 5d10 6s2 6p5", "the Greek 'astatos',
meaning unstable", 17, 'p', 210, 575, 610, 7);
//86
list add new NobleGas 86, "Radon", "Rn", "[Xe]4f14 5d10 6s2 6p6", "From radium, as it
was first detected as an emission from radium during radioactive decay", 18, 'p', 222,
202, 211.3, 0.00973);
//87
list add new AlkaliMetal 87, "Francium", "Fr", "[Rn]7s1", "France, where it was first
discovered", 1, 's', 223, 300, 950, 1.87);
//88
list add new AlkalineEarthMetals 88, "Radium", "Ra", "[Rn]7s2", "the Latin 'radius',
meaning ray", 2, 's', 226, 973, 2010, 5.5);
//89
list add new Actinide 89, "Actinium", "Ac", "[Rn]6d1 7s2", "the Greek 'actinos', meaning
a ray", 3, 'd', 227, 1323, 3471, 10.07);
//90
list add new Actinide 90, "Thorium", "Th", "[Rn]6d2 7s2", "Thor, the Scandinavian god
of thunder", 4, 'f', 232, 2115, 5061, 11.72);
//91
list add new Actinide 91, "Protactinium", "Pa", "[Rn]5f2 6d1 7s2", "the Greek 'protos', as
a prefix to the element actinium", 5, 'f', 231.03588, 1841, 4300, 15.37);
//92
list add new Actinide 92, "Uranium", "U", "[Rn]5f3 6d1 7s2", "Uranus, the seventh planet
in the Solar System", 6, 'f', 238.02891, 1405.3, 4404, 18.95);
//93
list add new Actinide 93, "Neptunium", "Np", "[Rn]5f4 6d1 7s2", "Neptune, the eighth
planet in the Solar System", 7, 'f', 237, 917, 4273, 20.45);
//94
list add new Actinide 94, "Plutonium", "Pu", "[Rn]5f6 7s2", "Pluto, a dwarf planet in the
Solar System", 8, 'f', 244, 912.5, 3501, 19.84);
//95
```

```
list add new Actinide 95, "Americium", "Am", "[Rn]5f7 7s2", "Americas, the continent  
where the element was first synthesized", 9, 'f', 243, 1449, 2880, 13.69);  
//96  
list add new Actinide 96, "Curium", "Cm", "[Rn]5f7 6d1 7s2", "Pierre Curie, a physicist,  
and Marie Curie, a physicist and chemist", 10, 'f', 247, 1613, 3383, 13.51);  
//97  
list add new Actinide 97, "Berkelium", "Bk", "[Rn]5f9 7s2", "Berkeley, California, USA,  
where the element was first synthesized", 11, 'f', 247, 1259, 2900, 14.79);  
//98  
list add new Actinide 98, "Californium", "Cf", "[Rn]5f10 7s2", "State of California, USA,  
where the element was first synthesized", 12, 'f', 251, 1173, 1743, 15.1);  
//99  
list add new Actinide 99, "Einsteinium", "Es", "[Rn]5f11 7s2", "Albert Einstein, physicist",  
13, 'f', 252, 1133, 1269, 8.84);  
//100  
list add new Actinide 100, "Fermium", "Fm", "[Rn]5f12 7s2", "Enrico Fermi, physicist",  
14, 'f', 257, 1125, 0, 0);  
//101  
list add new Actinide 101, "Mendelevium", "Md", "[Rn]5f13 7s2", "Dmitri Mendeleev,  
chemist and inventor", 15, 'f', 258, 1100, 0, 0);  
//102  
list add new Actinide 102, "Nobelium", "No", "[Rn]5f14 7s2", "Alfred Nobel, chemist,  
engineer, innovator, and armaments manufacturer", 16, 'f', 259, 1100, 0, 0);  
//103  
list add new Actinide 103, "Lawrencium", "Lr", "[Rn]5f14 7s2 7p1", "Ernest O. Lawrence,  
physicist", 17, 'f', 262, 1900, 0, 0);  
//104  
list add new TransitionMetals 104, "Rutherfordium", "Rf", "[Rn]5f14 6d2 7s2", "Ernest  
Rutherford, chemist and physicist", 4, 'd', 267, 2400, 5800, 23.2);  
//105  
list add new TransitionMetals 105, "Dubnium", "Db", "[Rn]5f14 6d3 7s2", "Dubna,  
Russia", 5, 'd', 268, 0, 0, 29.3);  
//106  
list add new TransitionMetals 106, "Seaborgium", "Sg", "[Rn]5f14 6d5 7s2", "Glenn T.  
Seaborg, scientist", 6, 'd', 269, 0, 0, 35.0);  
//107  
list add new TransitionMetals 107, "Bohrium", "Bh", "[Rn]5f14 6d5 7s2", "Hesse,  
Germany, where the element was first synthesized", 7, 'd', 270, 0, 0, 37.1);  
//108  
list add new TransitionMetals 108, "Hassium", "Hs", "[Rn]5f14 6d6 7s2", "Lise Meitner,  
physicist", 8, 'd', 269, 0, 0, 40.7);  
//109  
list add new TransitionMetals 109, "Meitnerium", "Mt", "[Rn]5f14 6d7 7s2", "Lise  
Meitner, physicist", 9, 'd', 269, 0, 0, 37.4);  
//110  
list add new TransitionMetals 110, "Darmstadtium", "Ds", "[Rn]5f14 6d8 7s2",  
"Darmstadt, Germany, where the element was first synthesized", 10, 'd', 278, 0, 0, 34.8);  
//111  
list add new TransitionMetals 111, "Roentgenium", "Rg", "[Rn]5f14 6d9 7s2", "Nicolaus  
Copernicus, astronomer", 11, 'd', 281, 0, 0, 28.7);
```

```

//112
list add new TransitionMetals(112, "Copernicium", "Cn", "[Rn]5f14 6d10 7s2", "IUPAC
systematic element name", 12, 'd', 285, 0, 357, 23.7);
//113
list add new BasicMetals(113, "Nihonium", "Nh", "[Rn]5f14 6d10 7s2 7p1", "Georgy
Flyorov, physicist", 13, 'p', 286, 700, 1400, 16);
//114
list add new BasicMetals(114, "Flerovium", "Fl", "[Rn]5f14 6d10 7s2 7p2", "IUPAC
systematic element name", 14, 'p', 289, 340, 420, 14);
//115
list add new BasicMetals(115, "Moscovium", "Mc", "[Rn] 5f14 6d9 7s2 7p3", "IUPAC
systematic element name", 15, 'p', 290, 0, 0, 0);
//116
list add new BasicMetals(116, "Livermorium", "Lv", "[Rn] 5f14 6d10 7s2 7p4", "IUPAC
systematic element name", 16, 'p', 293, 0, 0, 0);
//117
list add new Halogen(117, "Tennessine", "Ts", "[Rn] 5f14 6d10 7s2 7p5", "IUPAC
systematic element name", 17, 'p', 294, 0, 0, 0);
//118
list add new NobleGas(118, "Oganesson", "Og", "[Rn] 5f14 6d10 7s2 7p6", "IUPAC
systematic element name", 18, 'p', 294, 0, 0, 0);
    //Initialization Completed
}

public ArrayList<Element> getList() {
    return list;
}

```

✓ Menu Class --- Menu.java

```

package Elements;

import java.awt.EventQueue;
import java.io.*;
import java.util.ArrayList;
import java.util.InputMismatchException;
import java.util.Scanner;
import javax.swing.JFrame;
import javax.swing.JLabel;
import javax.swing.ImageIcon;
import javax.swing.JMenuBar;
import javax.swing.JMenu;
import java.awt.Color;
import javax.swing.JMenuItem;
import javax.swing.JOptionPane;
import javax.swing.JSeparator;
import java.awt.Font;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;

public class Menu {

```

```

private JFrame frame;

/**
 * Launch the application.
 */
public static void main String[] args {
    EventQueue.invokeLater new Runnable() {
        public void run() {
            try {
                Menu window = new Menu();
                window.frame.setVisible(true);
            } catch Exception e {
                e.printStackTrace();
            }
        }
    );
}

/**
 * Create the application.
 */
public Menu() {
    initialize();
}

/**
 * Initialize the contents of the frame.
 */
private void initialize() {
    frame = new JFrame "Periodic Table";
    frame.setBounds 100, 100, 1029, 640;
    frame.setDefaultCloseOperation JFrame.EXIT_ON_CLOSE;
    frame.getContentPane().setLayout null;

    //Background Image
    JLabel label = new JLabel "";
    label.setIcon new ImageIcon "G:\\NSU CSE\\3rd_Fall '19\\CSE 215
Project\\PeriodicTable\\periodic_1.jpg";
    label.setBounds 0, 29, 1013, 583;
    frame.getContentPane().add label);

    //CreatingMenuBar
    JMenuBar menuBar = new JMenuBar();
    menuBar.setBounds 0, 0, 1013, 28;
    frame.getContentPane().add menuBar);

    JMenu mnPeriodicTable = new JMenu "Periodic Table";
    mnPeriodicTable.setForeground new Color 0, 0, 0);
    mnPeriodicTable.setFont new Font "Georgia", Font.BOLD, 14);
    mnPeriodicTable.setBackground Color.CYAN;
    menuBar.add mnPeriodicTable);
}

```

```

//Periodic Table Frame (invoking)
JMenuItem mnitmViewWithDetails = new JMenuItem "Modern Periodic
Table with details";
mnitmViewWithDetails.addActionListener new ActionListener{
    public void actionPerformed(ActionEvent arg0 {
        Modern_Periodic_Table table = new
Modern_Periodic_Table();
        table.setVisible(true);
        //frame.dispose();
    }
};

mnitmViewWithDetails.setForeground new Color 0, 0, 0);
mnitmViewWithDetails.setBackground Color.CYAN;
mnitmViewWithDetails.setFont new Font "Georgia", Font.BOLD, 13);
mnPeriodicTable.add(mnitmViewWithDetails);

JSeparator separator = new JSeparator();
mnPeriodicTable.add(separator);

JMenuItem mnitmHistoryOfModern = new JMenuItem "History of Modern
Periodic Table";
mnitmHistoryOfModern.addActionListener new ActionListener{
    public void actionPerformed(ActionEvent e) {

        try {
            File file = new File "periodictable.txt";
            if file.exists() {
                Scanner input = new Scanner (file);
                ArrayList<String> list = new ArrayList<>();
                input.useDelimiter(".");
                while input.hasNext() {
                    list.add(input.nextLine()+"\n");
                }
                input.close();
                Text text = new Text list.toString();
                text.setVisible true ;
            }
        } catch Exception ex) {
            JOptionPane.showMessageDialog null, "File not
found.");
        }
    }
};

mnitmHistoryOfModern.setForeground Color.BLACK;
mnitmHistoryOfModern.setBackground Color.CYAN);

```

```

mnmHistoryOfModern.setFont(new Font("Georgia", Font.BOLD, 13));
mnPeriodicTable.add(mnmHistoryOfModern);

JSeparator separator_1 = new JSeparator();
mnPeriodicTable.add(separator_1);

JMenuItem mnmDetailsAboutModern = new JMenuItem("Details about
Modern Periodic Table");
mnmDetailsAboutModern.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        try {
            File file = new File("info.txt");
            if (file.exists()) {
                Scanner input = new Scanner(file);
                ArrayList<String> list = new ArrayList<>();
                // input.useDelimiter("\n");

                while (input.hasNext()) {
                    list.add(input.nextLine());
                }

                input.close();
                Text text = new Text(list.toString());
                text.setVisible(true);
            }
        } catch (Exception ex) {
            JOptionPane.showMessageDialog(null, "File not
found.");
        }
    }
});
mnmDetailsAboutModern.setBackground(Color.CYAN);
mnmDetailsAboutModern.setForeground(Color.BLACK);
mnmDetailsAboutModern.setFont(new Font("Georgia", Font.BOLD, 13));
mnPeriodicTable.add(mnmDetailsAboutModern);

JMenu mnSearchElements = new JMenu("Search Elements");
mnSearchElements.setForeground(Color.BLACK);
mnSearchElements.setFont(new Font("Georgia", Font.BOLD, 14));
menuBar.add(mnSearchElements);

// Searching Elements
JMenuItem mnmSearchByAtomic = new JMenuItem("Search by Atomic
Number");
mnmSearchByAtomic.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        try {

```

```

String numberString =
JOptionPane.showInputDialog null,"Enter Atomic Number : ",null;
if numberString != null {
    int num = Integer.parseInt numberString);

    if(num < 1 || num > 118)
        throw new IllegalArgumentException("Wrong input");

    ArrayList<Element> list = new ArrayList<>();
    ArrayElements elements = new ArrayElements();
    list = elements.getList());

    for int i = 0 ; i < list.size(); i++) {
        if(num == list.get(i).getAtomicNumber())){
            Text text = new Text list.get(i).toString());
            text.setVisible(true);
            break;
        }
    }
    catch Exception ex {
        JOptionPane.showMessageDialog null, "You did not enter a valid
atomic number.", "Failure", JOptionPane.ERROR_MESSAGE;
    }
}
mnmSearchByAtomic.setForeground Color.BLACK;
mnmSearchByAtomic.setFont new Font "Georgia", Font.BOLD, 13);
mnmSearchByAtomic.setBackground Color.PINK;
mnSearchElements.add mnmSearchByAtomic;

JSeparator separator_2 = new JSeparator();
mnSearchElements.add separator_2;

JMenuItem mnmSearchByElement = new JMenuItem "Search by Element
Name";
mnmSearchByElement.addActionListener new ActionListener() {
public void actionPerformed ActionEvent e) {
    try {
        String name = JOptionPane.showInputDialog "Enter ElementName :
    }

        if name!= null {
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();
            int i;
            for(i = 0 ; i < list.size(); i++) {

if name.equalsIgnoreCase list.get(i).getName()) {
    Text text = new Text(
list.get(i).toString());

```

```

text.setVisible(true);

break;

if i >= list.size()
    throw new IllegalArgumentException("Wrong input");
}

catch Exception ex {
    JOptionPane.showMessageDialog null, "You did not enter a valid correct element name.", "Failure", JOptionPane.ERROR_MESSAGE;
}

mnmSearchByElement.setBackground Color.PINK;
mnmSearchByElement.setForeground Color.BLACK;
mnmSearchByElement.setFont new Font "Georgia", Font.BOLD, 13);
mnSearchElements.add mnmSearchByElement;

JSeparator separator_3 = new JSeparator();
mnSearchElements.add separator_3;

JMenuItem mnmSearchByElement_1 = new JMenuItem("Search by Element
Symbol");
mnmSearchByElement_1.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        try {
            String symbol = JOptionPane.showInputDialog "Enter
Element Symbol : ";
            if symbol != null {
                ArrayList<Element> list = new ArrayList<>();
                ArrayElements elements = new ArrayElements();
                list = elements.getList();
                int i;
                for( i = 0 ; i < list.size(); i++) {

                    if symbol.equalsIgnoreCase list.get i).getSymbol()) {
                        Text text = new Text list.get i).toString());
                        text.setVisible true ;
                        break;
                    }
                }
                if i >= list.size()
                    throw new IllegalArgumentException("Wrong input");
            }
        }
        catch Exception ex {
            JOptionPane.showMessageDialog null, "You did not enter a valid correct element symbol.", "Failure", JOptionPane.ERROR_MESSAGE);
        }
    }
}

```

```

        }
    );
    mntmSearchByElement_1.setForeground Color.BLACK;
    mntmSearchByElement_1.setFont new Font "Georgia", Font.BOLD, 13);
    mntmSearchByElement_1.setBackground Color.PINK);
    mnSearchElements.add(mntmSearchByElement_1);

JMenu mnOnlineHelp = new JMenu "Online Help";
mnOnlineHelp.setForeground Color.BLACK);
mnOnlineHelp.setFont new Font "Georgia", Font.BOLD, 14));
menuBar.add(mnOnlineHelp);

JMenuItem mntmUsefulWebsites = new JMenuItem "Useful Websites";
mntmUsefulWebsites.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent arg0) {
        Online online = new Online();
        online.setVisible true ;
    }
};

mntmUsefulWebsites.setFont new Font "Georgia", Font.BOLD, 13);
mntmUsefulWebsites.setBackground Color.CYAN);
mnOnlineHelp.add(mntmUsefulWebsites);

JMenu mnQuickTest = new JMenu "Test Yourself";
mnQuickTest.setForeground Color.BLACK);
mnQuickTest.setFont new Font "Georgia", Font.BOLD, 14));
menuBar.add(mnQuickTest);

//TEST
JMenuItem mntmQuickTest = new JMenuItem "Quick Test ";
mntmQuickTest.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent arg0) {
        try {
            Quiz quiz = new Quiz();
        } catch (Exception e) {
            JOptionPane.showMessageDialog null,
e.getMessage());
        }
    }
};

mntmQuickTest.setFont new Font "Georgia", Font.BOLD, 13);
mntmQuickTest.setBackground Color.PINK);
mnQuickTest.add(mntmQuickTest);

JMenu mnHelp = new JMenu "Help";

```

```

mnHelp.setFont new Font "Georgia", Font.BOLD, 14);
mnHelp.setForeground Color.BLACK;
menuBar.add mnHelp);

JMenuItem mntmComment = new JMenuItem "Comment";
mntmComment.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        Comment comment = new Comment();
        comment.setVisible true;
    }
);
mntmComment.setBackground Color.CYAN;
mntmComment.setFont new Font("Georgia", Font.BOLD, 14);
mntmComment.setForeground Color.BLACK;
mnHelp.add mntmComment);

JSeparator separator_4 = new JSeparator();
mnHelp.add separator_4);

JSeparator separator_5 = new JSeparator();
mnHelp.add separator_5);

JMenuItem mntmAboutThisApplication = new JMenuItem "About this
application";
mntmAboutThisApplication.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent arg0) {
        JOptionPane.showMessageDialog null, "This application is
developed for CSE215 project of North South University.\n"
            + "This is submitted to the instructor of this
course, Silvia Ahmed.\nThe application is developed by team ERROR.\n"
            + "Members : \nNazmul Hasan
[1911742]\nSamya Sunibir Das [1911563]\nThank you.");
    }
);
mntmAboutThisApplication.setBackground Color.CYAN;
mntmAboutThisApplication.setFont new Font("Georgia", Font.BOLD, 14);
mntmAboutThisApplication.setForeground Color.BLACK;
mnHelp.add mntmAboutThisApplication);

JSeparator separator_6 = new JSeparator();
mnHelp.add separator_6);

JMenu mnNewMenu = new JMenu "Rate us";
mnNewMenu.setBackground Color.CYAN;
mnNewMenu.setForeground Color.BLACK;
mnNewMenu.setFont new Font "Georgia", Font.BOLD, 14);
mnHelp.add mnNewMenu;

JMenuItem mntmNewMenuItem = new JMenuItem "See current rating";

```

```

mnmNewMenuItem.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent arg0 {
        try {
            File file = new File "rating.txt";
            Scanner input = new Scanner file;
            int count = 0;
            double rate = 0;

            while(input.hasNextDouble()){
                rate+= input.nextDouble();
                count++;
            }
        } catch (Exception ex) {
            JOptionPane.showInputDialog null,"Average rating: " +(rate/count) +" out of 10";
        }
    }
};

mnmNewMenuItem.setBackground Color.CYAN;
mnmNewMenuItem.setFont new Font "Segoe UI", Font.BOLD, 12);
mnNewMenu.add mnmNewMenuItem);

JSeparator separator_7 = new JSeparator();
mnNewMenu.add separator_7;

JMenuItem mnmRate = new JMenuItem "Rate ";
mnmRate.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e){
        BufferedWriter buff,
        try {
            double point = 0;
            String value = JOptionPane.showInputDialog "Rate it
on a scale of 10 : ";

            if value != null{
                point = Double.parseDouble(value);

                if (point < 0 || point > 10)
                    throw new IllegalArgumentException "Wrong input";
            }

            File rating = new File "rating.txt";
            if !rating.exists()
                rating.createNewFile();

            //Here true is to append the content to file
            buff = new BufferedWriter new FileWriter(rating,
true);
            buff.write "\n"+value+" ";
        }
    }
};

```

```
        buff.close();
    }
    catch (Exception ex) {
        JOptionPane.showMessageDialog(null, "You did not
enter a valid input.", "Failure", JOptionPane.ERROR_MESSAGE);
    }
}
mnmRate.setBackground Color.CYAN;
mnmRate.setFont new Font "Segoe UI", Font.BOLD, 12);
mnNewMenu add mnmRate;

JMenuItem mnmHistoryOfPeriodic = new JMenuItem();
mnmHistoryOfPeriodic.setBounds 0, 55, 129, 22);
frame getContentPane() add mnmHistoryOfPeriodic;
}
```

✓ ModernPeriodicTable Class--- ModernPeriodicTable.java

```
package Elements;
import java.util.*;
import java.awt.BorderLayout;
import java.awt.EventQueue;

import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import javax.swing.ImageIcon;
import javax.swing.JTextField;
import java.awt.Label;
import java.awt.Font;
import java.awt.Color;
import javax.swing.JButton;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;
import java.awt.SystemColor;
import javax.swing.UIManager;

public class Modern_Periodic_Table extends JFrame {

    private JPanel contentPane;

    /**
     * Launch the application.
     */
    public static void main String[] args) {

```

```

EventQueue.invokeLater new Runnable() {
    public void run() {
        try {
            Modern_Periodic_Table frame = new
Modern_Periodic_Table();
            frame.setTitle "MODERN PERIODIC TABLE";
            frame.setVisible true;
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
};

/*
 * Create the frame.
 */
public Modern_Periodic_Table() {
    setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
    setBounds 100, 100, 1344, 710;
    contentPane = new JPanel();
    contentPane.setForeground(new Color 51, 255, 0);
    contentPane.setBackground SystemColor.activeCaption;
    contentPane.setBorder new EmptyBorder(5, 5, 5, 5);
    setContentPane contentPane);
    contentPane.setLayout null;

    JLabel label = new JLabel("");
    label.setIcon new ImageIcon "mandiliv.jpeg");
    label.setBounds(257, 11, 60, 60);
    contentPane.add(label);

    JLabel lblNewLabel = new JLabel "MODERN PERIODIC TABLE WITH
DETAILS";
    lblNewLabel.setForeground new Color 255, 0, 0);
    lblNewLabel.setBackground new Color 255, 0, 0);
    lblNewLabel.setFont new Font "Georgia", Font.BOLD, 22);
    lblNewLabel.setBounds 369, 14, 585, 57);
    contentPane.add(lblNewLabel);

    //SODIUM
    JButton btnK = new JButton "Na";
    btnK.setForeground Color MAGENTA);
    btnK.setBackground UIManager.getColor("Button.background"));
    btnK.setFont new Font "Georgia", Font.BOLD, 17);
    btnK.addActionListener new ActionListener() {
        public void actionPerformed.ActionEvent arg0 {
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();


```

```

        Text text = new Text(list.get(10).toString());
        text.setVisible(true);
    }

};

btnK.setBounds(10, 213, 70, 37);
contentPane.add(btnK);

//LITHIUM
JButton btnLi = new JButton("Li");
btnLi.setForeground Color MAGENTA;
btnLi.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(2).toString());
        text.setVisible(true);
    }

};

btnLi.setBackground UIManager.getColor "Button.background");
btnLi.setFont new Font "Georgia", Font BOLD, 17);
btnLi.setBounds 10, 161, 70, 37);
contentPane.add(btnLi);

//POTASSIUM
JButton button_1 = new JButton("K");
button_1.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(18).toString());
        text.setVisible(true);
    }

};

button_1.setForeground Color MAGENTA;
button_1.setBackground UIManager.getColor "Button.background");
button_1.setFont new Font "Georgia", Font BOLD, 17);
button_1.setBounds 10, 265, 70, 37);
contentPane.add(button_1);

//RUBIDIUM
JButton btnRb = new JButton("Rb");
btnRb.setForeground Color MAGENTA;
btnRb.setBackground UIManager.getColor "Button.background");
btnRb.addActionListener new ActionListener() {

```

```

public void actionPerformed ActionEvent arg0 {
    ArrayList<Element> list = new ArrayList<>();
    ArrayElements elements = new ArrayElements();
    list = elements.getList();

    Text text = new Text(list.get(36).toString());
    text.setVisible(true);
}

btnRb.setFont new Font "Georgia", Font BOLD, 17);
btnRb.setBounds 10, 319, 70, 37);
contentPane add(btnRb);

JButton btnFr = new JButton "Fr";
btnFr.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(86).toString());
        text.setVisible(true);
    }
};

btnFr.setForeground Color MAGENTA;
btnFr.setFont new Font "Georgia", Font BOLD, 17);
btnFr.setBounds 10, 425, 70, 37);
contentPane add(btnFr);

JButton btnCs = new JButton "Cs";
btnCs.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(54).toString());
        text.setVisible(true);
    }
};

btnCs.setForeground Color MAGENTA;
btnCs.setFont new Font "Georgia", Font BOLD, 17);
btnCs.setBounds 10, 372, 70, 37);
contentPane add(btnCs);

//HYDROGEN
JButton btnH = new JButton "H";
btnH.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
}
}

```

```
ArrayList<Element> list = new ArrayList<>();
ArrayElements elements = new ArrayElements();
list = elements.getList();

Text text = new Text(list.get(0).toString());
text.setVisible(true);
}

btnH.setForeground Color.BLUE;
btnH.setBackground UIManager.getColor("Button.background"));
btnH.setFont new Font "Georgia", Font.BOLD, 17);
btnH.setBounds 10, 107, 70, 37);
contentPane.add(btnH);

JLabel lblHydrogen = new JLabel "Hydrogen";
lblHydrogen.setFont new Font "Georgia", Font.PLAIN, 11));
lblHydrogen.setBounds 10, 145, 80, 14);
contentPane.add(lblHydrogen);

JLabel lblLithium = new JLabel "Lithium";
lblLithium.setFont new Font "Georgia", Font.PLAIN, 11));
lblLithium.setBounds 10, 197, 70, 14);
contentPane.add(lblLithium);

JLabel lblSodium = new JLabel "Sodium";
lblSodium.setFont new Font "Georgia", Font.PLAIN, 11));
lblSodium.setBounds 10, 250, 70, 14);
contentPane.add(lblSodium);

JLabel lblPotassium = new JLabel "Potassium";
lblPotassium.setFont new Font "Georgia", Font.PLAIN, 11));
lblPotassium.setBounds(10, 302, 70, 14);
contentPane.add(lblPotassium);

JLabel lblRubidium = new JLabel "Rubidium";
lblRubidium.setFont new Font "Georgia", Font.PLAIN, 11));
lblRubidium.setBounds 10, 356, 70, 14);
contentPane.add(lblRubidium);

JLabel lblCesium = new JLabel "Cesium";
lblCesium.setFont new Font "Georgia", Font.PLAIN, 11));
lblCesium.setBounds 10, 408, 70, 14);
contentPane.add(lblCesium);

JLabel lblDarmstadtium = new JLabel "Francium";
lblDarmstadtium.setFont new Font "Georgia", Font.PLAIN, 11));
lblDarmstadtium.setBounds 10, 462, 86, 14);
contentPane.add(lblDarmstadtium);
```

```

JButton btnCa_1 = new JButton "Ca";
btnCa_1.setForeground new Color(128, 0, 128);
btnCa_1.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(19).toString());
        text.setVisible(true);
    }
};

btnCa_1.setFont new Font "Georgia", Font BOLD, 17);
btnCa_1.setBackground UIManager getColor "Button.background");
btnCa_1.setBounds 83, 265, 70, 37);
contentPane.add(btnCa_1);

JButton btnSc = new JButton "Sc";
btnSc.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(20).toString());
        text.setVisible(true);
    }
};

btnSc.setForeground new Color(0, 191, 255);
btnSc.setFont new Font "Georgia", Font BOLD, 17);
btnSc.setBackground UIManager getColor "Button.background");
btnSc.setBounds(156, 265, 70, 37);
contentPane.add(btnSc);

JButton btnTi = new JButton "Ti";
btnTi.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(21).toString());
        text.setVisible(true);
    }
};

btnTi.setForeground new Color(0, 206, 209 );
btnTi.setFont new Font "Georgia", Font BOLD, 17);
btnTi.setBackground UIManager getColor "Button.background");
btnTi.setBounds(229, 265, 70, 37);

```

```

contentPane.add(btnTi);

JButton btnV = new JButton "V";
btnV.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(22).toString());
        text.setVisible(true);
    }
};

btnV.setForeground new Color(0, 204, 204);
btnV.setFont new Font("Georgia", Font.BOLD, 17);
btnV.setBackground UIManager.getColor("Button.background"));
btnV.setBounds(301, 265, 70, 37);
contentPane.add(btnV);

JButton btnCr = new JButton "Cr";
btnCr.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(23).toString());
        text.setVisible(true);
    }
};

btnCr.setForeground new Color(72, 209, 204);
btnCr.setFont new Font("Georgia", Font.BOLD, 17);
btnCr.setBackground UIManager.getColor("Button.background"));
btnCr.setBounds(374, 265, 70, 37);
contentPane.add(btnCr);

JButton btnCr_17 = new JButton "Mn";
btnCr_17.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(25).toString());
        text.setVisible(true);
    }
};

btnCr_17.setForeground new Color(72, 209, 204);
btnCr_17.setFont new Font("Georgia", Font.BOLD, 17);
btnCr_17.setBackground UIManager.getColor("Button.background"));

```

```

btnCr_17.setBounds(446, 265, 70, 37);
contentPane.add(btnCr_17);

JButton btnCr_16 = new JButton("Fe");
btnCr_16.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(25).toString());
        text.setVisible(true);
    }
});
btnCr_16.setForeground(new Color(72, 209, 204));
btnCr_16.setFont(new Font("Georgia", Font.BOLD, 17));
btnCr_16.setBackground(UIManager.getColor("Button.background"));
btnCr_16.setBounds(519, 265, 70, 37);
contentPane.add(btnCr_16);

JButton btnCr_15 = new JButton("Co");
btnCr_15.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(26).toString());
        text.setVisible(true);
    }
});
btnCr_15.setForeground(new Color(72, 209, 204));
btnCr_15.setFont(new Font("Georgia", Font.BOLD, 17));
btnCr_15.setBackground(UIManager.getColor("Button.background"));
btnCr_15.setBounds(592, 265, 70, 37);
contentPane.add(btnCr_15);

JButton btnCr_12 = new JButton("Ni");
btnCr_12.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(27).toString());
        text.setVisible(true);
    }
});
btnCr_12.setForeground(new Color(72, 209, 204));
btnCr_12.setFont(new Font("Georgia", Font.BOLD, 17));

```

```

btnCr_12.setBackground UIManager.getColor("Button.background"));
btnCr_12.setBounds 665, 265, 70, 37;
contentPane.add(btnCr_12);

JButton btnCr_11 = new JButton "Cu";
btnCr_11.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(28).toString());
        text.setVisible(true);
    }
};

btnCr_11.setForeground new Color(72, 209, 204);
btnCr_11.setFont new Font "Georgia", Font BOLD, 17);
btnCr_11.setBackground UIManager.getColor("Button.background"));
btnCr_11.setBounds 739, 265, 70, 37);
contentPane.add(btnCr_11);

JButton btnCr_4 = new JButton "Zn";
btnCr_4.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(29).toString());
        text.setVisible(true);
    }
};

btnCr_4.setForeground new Color(72, 209, 204);
btnCr_4.setFont new Font "Georgia", Font BOLD, 17);
btnCr_4.setBackground UIManager.getColor("Button.background"));
btnCr_4.setBounds 812, 265, 70, 37);
contentPane.add(btnCr_4);

JButton btnGa = new JButton "Ga";
btnGa.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(30).toString());
        text.setVisible(true);
    }
};

btnGa.setForeground new Color(255, 69, 0));

```

```

btnGa.setFont new Font "Georgia", Font.BOLD, 17);
btnGa.setBackground UIManager.getColor "Button.background");
btnGa.setBounds 884, 265, 70, 37;
contentPane.add(btnGa);

JButton btnGe = new JButton "Ge";
btnGe.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 31).toString());
        text.setVisible(true);
    }
};

btnGe.setForeground new Color 51, 204, 0);
btnGe.setFont new Font "Georgia", Font.BOLD, 17);
btnGe.setBackground UIManager.getColor "Button.background");
btnGe.setBounds 957, 265, 70, 37);
contentPane.add(btnGe);

JButton btnAs = new JButton "As";
btnAs.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 32).toString());
        text.setVisible(true);
    }
};

btnAs.setForeground new Color 51, 204, 0);
btnAs.setFont new Font "Georgia", Font.BOLD, 17);
btnAs.setBackground UIManager.getColor "Button.background");
btnAs.setBounds 1030, 265, 70, 37);
contentPane.add(btnAs);

JButton btnSe = new JButton "Se";
btnSe.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 33).toString());
        text.setVisible(true);
    }
};

```

```

btnSe.setForeground new Color(51, 0, 204);
btnSe.setFont new Font("Georgia", Font.BOLD, 17);
btnSe.setBackground UIManager.getColor("Button.background"));
btnSe.setBounds(1103, 265, 70, 37);
contentPane.add(btnSe);

JButton btnBr = new JButton("Br");
btnBr.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(34).toString());
        text.setVisible(true);
    }
};

btnBr.setForeground new Color(255, 204, 51);
btnBr.setFont new Font("Georgia", Font.BOLD, 17);
btnBr.setBackground UIManager.getColor("Button.background"));
btnBr.setBounds(1176, 265, 70, 37);
contentPane.add(btnBr);

JButton btnKr = new JButton("Kr");
btnKr.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(35).toString());
        text.setVisible(true);
    }
};

btnKr.setForeground new Color(255, 255, 0);
btnKr.setFont new Font("Georgia", Font.BOLD, 17);
btnKr.setBackground UIManager.getColor("Button.background"));
btnKr.setBounds(1249, 265, 70, 37);
contentPane.add(btnKr);

JButton btnSr = new JButton("Sr");
btnSr.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(37).toString());
        text.setVisible(true);
    }
};

```

```

    );
    btnSr.setForeground new Color(128, 0, 128);
    btnSr.setFont new Font "Georgia", Font BOLD, 17);
    btnSr.setBackground UIManager.getColor("Button.background"));
    btnSr.setBounds 83, 319, 70, 37);
    contentPane.add(btnSr);

    JButton btnY = new JButton "Y";
    btnY.addActionListener new ActionListener() {
        public void actionPerformed ActionEvent e) {
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(38).toString());
            text.setVisible(true);
        }
    );
    btnY.setForeground new Color(0, 191, 255);
    btnY.setFont new Font "Georgia", Font BOLD, 17);
    btnY.setBackground UIManager.getColor("Button.background"));
    btnY.setBounds(156, 319, 70, 37);
    contentPane.add(btnY);

    JButton btnZr = new JButton "Zr";
    btnZr.addActionListener new ActionListener() {
        public void actionPerformed ActionEvent e) {
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(39).toString());
            text.setVisible(true);
        }
    );
    btnZr.setForeground new Color(0, 206, 209);
    btnZr.setFont new Font "Georgia", Font BOLD, 17);
    btnZr.setBackground UIManager.getColor("Button.background"));
    btnZr.setBounds(228, 319, 70, 37);
    contentPane.add(btnZr);

    JButton btnNb = new JButton "Nb";
    btnNb.addActionListener new ActionListener() {
        public void actionPerformed ActionEvent e) {
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(40).toString());
            text.setVisible(true);
        }
    );

```

```

        text.setVisible(true);
    }
}

btnNb.setForeground new Color 0, 204, 204);
btnNb.setFont new Font "Georgia", Font BOLD, 17);
btnNb.setBackground UIManager getColor"Button.background");
btnNb.setBounds 301, 319, 70, 37;
contentPane.add(btnNb);

JButton btnCr_1 = new JButton "Mo";
btnCr_1.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 41).toString());
        text.setVisible(true);
    }
}
btnCr_1.setForeground new Color 72, 209, 204);
btnCr_1.setFont new Font "Georgia", Font BOLD, 17);
btnCr_1.setBackground UIManager getColor"Button.background");
btnCr_1.setBounds 373, 319, 70, 37;
contentPane.add(btnCr_1);

JButton btnCr_18 = new JButton "Tc";
btnCr_18.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 42).toString());
        text.setVisible(true);
    }
}
btnCr_18.setForeground new Color 72, 209, 204);
btnCr_18.setFont new Font "Georgia", Font BOLD, 17);
btnCr_18.setBackground UIManager getColor"Button.background");
btnCr_18.setBounds 446, 319, 70, 37;
contentPane.add(btnCr_18);

JButton btnCr_19 = new JButton "Ru";
btnCr_19.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();
    }
}

```

```

        Text text = new Text(list.get 43).toString());
        text.setVisible(true);
    }
}

btnCr_19.setForeground new Color(72, 209, 204);
btnCr_19.setFont new Font "Georgia", Font BOLD, 17);
btnCr_19.setBackground UIManager getColor "Button.background");
btnCr_19.setBounds 519, 319, 70, 37;
contentPane.add(btnCr_19);

JButton btnCr_14 = new JButton "Rh";
btnCr_14.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 44).toString());
        text.setVisible(true);
    }
}

btnCr_14.setForeground new Color(72, 209, 204);
btnCr_14.setFont new Font "Georgia", Font BOLD, 17);
btnCr_14.setBackground UIManager getColor "Button.background");
btnCr_14.setBounds 592, 319, 70, 37;
contentPane.add(btnCr_14);

JButton btnCr_13 = new JButton "Pd";
btnCr_13.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 45).toString());
        text.setVisible(true);
    }
}

btnCr_13.setForeground new Color(72, 209, 204);
btnCr_13.setFont new Font "Georgia", Font BOLD, 17);
btnCr_13.setBackground UIManager getColor "Button.background");
btnCr_13.setBounds 665, 319, 70, 37;
contentPane.add(btnCr_13);

JButton btnCr_10 = new JButton "Ag";
btnCr_10.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();
    }
}

```

```

        Text text = new Text(list.get(46).toString());
        text.setVisible(true);
    }

};

btnCr_10.setForeground new Color(72, 209, 204);
btnCr_10.setFont new Font "Georgia", Font BOLD, 17);
btnCr_10.setBackground UIManager.getColor("Button.background");
btnCr_10.setBounds 738, 319, 70, 37;
contentPane.add(btnCr_10);

JButton btnCr_5 = new JButton "Cd";
btnCr_5.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(47).toString());
        text.setVisible(true);
    }

};

btnCr_5.setForeground new Color(72, 209, 204);
btnCr_5.setFont new Font "Georgia", Font BOLD, 17);
btnCr_5.setBackground UIManager.getColor("Button.background");
btnCr_5.setBounds 812, 319, 70, 37;
contentPane.add(btnCr_5);

JButton btnIn = new JButton "In";
btnIn.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(48).toString());
        text.setVisible(true);
    }

};

btnIn.setForeground new Color(255, 69, 0);
btnIn.setFont new Font "Georgia", Font BOLD, 17);
btnIn.setBackground UIManager.getColor("Button.background");
btnIn.setBounds 885, 319, 70, 37;
contentPane.add(btnIn);

JButton btnSn = new JButton "Sn";
btnSn.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();

```

```

        list = elements.getList();

        Text text = new Text(list.get(49).toString());
        text.setVisible(true);
    }

};

btnSn.setForeground new Color 255, 69, 0);
btnSn.setFont new Font "Georgia", Font.BOLD, 17);
btnSn.setBackground UIManager.getColor "Button.background");
btnSn.setBounds 957, 319, 70, 37);
contentPane add(btnSn);

JButton btnSb = new JButton "Sb";
btnSb.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(50).toString());
        text.setVisible(true);
    }

};

btnSb.setForeground new Color 51, 204, 0);
btnSb.setFont new Font "Georgia", Font.BOLD, 17);
btnSb.setBackground UIManager.getColor "Button.background");
btnSb.setBounds 1030, 319, 70, 37);
contentPane add(btnSb);

JButton btnTe = new JButton "Te";
btnTe.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(51).toString());
        text.setVisible(true);
    }

};

btnTe.setForeground new Color 51, 204, 0);
btnTe.setFont new Font "Georgia", Font.BOLD, 17);
btnTe.setBackground UIManager.getColor "Button.background");
btnTe.setBounds 1103, 319, 70, 37);
contentPane add(btnTe);

JButton btnI = new JButton "I";
btnI.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();

```

```

        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(52).toString());
        text.setVisible(true);
    }

};

btnL.setForeground new Color(255, 204, 51);
btnL.setFont new Font("Georgia", Font.BOLD, 17);
btnL.setBackground UIManager.getColor("Button.background"));
btnL.setBounds 1176, 319, 70, 37;
contentPane.add(btnL);

JButton btnBa = new JButton("Ba");
btnBa.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(55).toString());
        text.setVisible(true);
    }

};

btnBa.setForeground new Color(128, 0, 128);
btnBa.setFont new Font("Georgia", Font.BOLD, 17);
btnBa.setBackground UIManager.getColor("Button.background"));
btnBa.setBounds(83, 372, 70, 37);
contentPane.add(btnBa);

JButton button_35 = new JButton("57-71");
button_35.setFont new Font("Georgia", Font.BOLD, 13));
button_35.setBackground new Color(51, 255, 0);
button_35.setBounds 156, 372, 70, 37;
contentPane.add(button_35);

JButton btnHf = new JButton("Hf");
btnHf.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(71).toString());
        text.setVisible(true);
    }

};

btnHf.setForeground new Color(0, 206, 209);
btnHf.setFont new Font("Georgia", Font.BOLD, 17));

```

```

btnHf.setBackground UIManager.getColor("Button.background"));
btnHf.setBounds(228, 372, 70, 37);
contentPane.add(btnHf);

JButton btnTa = new JButton "Ta";
btnTa.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(72).toString());
        text.setVisible(true);
    }
};

btnTa.setForeground new Color(0, 204, 204);
btnTa.setFont new Font "Georgia", Font.BOLD, 17);
btnTa.setBackground UIManager.getColor "Button.background");
btnTa.setBounds(301, 372, 70, 37);
contentPane.add(btnTa);

JButton btnCr_2 = new JButton "W";
btnCr_2.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(73).toString());
        text.setVisible(true);
    }
};

btnCr_2.setForeground new Color(72, 209, 204);
btnCr_2.setFont new Font "Georgia", Font.BOLD, 17);
btnCr_2.setBackground UIManager.getColor "Button.background");
btnCr_2.setBounds(373, 372, 70, 37);
contentPane.add(btnCr_2);

JButton btnCr_20 = new JButton "Re";
btnCr_20.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(74).toString());
        text.setVisible(true);
    }
};

btnCr_20.setForeground new Color(72, 209, 204));

```

```

btnCr_20setFont new Font "Georgia", Font BOLD, 17);
btnCr_20setBackground UIManager getColor("Button.background"));
btnCr_20setBounds 446, 372, 70, 37;
contentPane.add(btnCr_20);

JButton btnCr_21 = new JButton "Os";
btnCr_21.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 75).toString());
        text.setVisible(true);
    }
};

btnCr_21.setForeground new Color(72, 209, 204);
btnCr_21.setFont new Font "Georgia", Font BOLD, 17);
btnCr_21.setBackground UIManager getColor("Button.background"));
btnCr_21.setBounds 519, 372, 70, 37;
contentPane.add(btnCr_21);

JButton btnCr_25 = new JButton "Ir";
btnCr_25.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 76).toString());
        text.setVisible(true);
    }
};

btnCr_25.setForeground new Color(72, 209, 204);
btnCr_25.setFont new Font "Georgia", Font BOLD, 17);
btnCr_25.setBackground UIManager getColor("Button.background"));
btnCr_25.setBounds 592, 372, 70, 37;
contentPane.add(btnCr_25);

JButton btnCr_26 = new JButton "Pt";
btnCr_26.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 77).toString());
        text.setVisible(true);
    }
};

```

```

    );
    btnCr_26.setForeground new Color(72, 209, 204);
    btnCr_26.setFont new Font("Georgia", Font.BOLD, 17);
    btnCr_26.setBackground UIManager.getColor("Button.background"));
    btnCr_26.setBounds 665, 372, 70, 37;
    contentPane.add(btnCr_26);

    JButton btnCr_9 = new JButton("Au");
    btnCr_9.addActionListener new ActionListener(){
        public void actionPerformed(ActionEvent e){
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(78).toString());
            text.setVisible(true);
        }
    );
    btnCr_9.setForeground new Color(72, 209, 204);
    btnCr_9.setFont new Font("Georgia", Font.BOLD, 17);
    btnCr_9.setBackground UIManager.getColor("Button.background"));
    btnCr_9.setBounds 738, 372, 70, 37;
    contentPane.add(btnCr_9);

    JButton btnCr_6 = new JButton("Hg");
    btnCr_6.addActionListener new ActionListener(){
        public void actionPerformed(ActionEvent e){
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(79).toString());
            text.setVisible(true);
        }
    );
    btnCr_6.setForeground new Color(72, 209, 204);
    btnCr_6.setFont new Font("Georgia", Font.BOLD, 17);
    btnCr_6.setBackground UIManager.getColor("Button.background"));
    btnCr_6.setBounds 811, 372, 70, 37;
    contentPane.add(btnCr_6);

    JButton btnTi_1 = new JButton("Ti");
    btnTi_1.addActionListener new ActionListener(){
        public void actionPerformed(ActionEvent e){
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(80).toString());
            text.setVisible(true);
        }
    );

```

```

        }

    );
    btnTi_1.setForeground new Color 255, 69, 0);
    btnTi_1.setFont new Font "Georgia", Font BOLD, 17);
    btnTi_1.setBackground UIManager.getColor("Button.background"));
    btnTi_1.setBounds 884, 372, 70, 37);
    contentPane.add(btnTi_1);

JButton btnRa = new JButton "Ra";
btnRa.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(87).toString());
        text.setVisible(true);
    }
};

btnRa.setForeground new Color 128, 0, 128);
btnRa.setFont new Font "Georgia", Font BOLD, 17);
btnRa.setBackground UIManager.getColor("Button.background"));
btnRa.setBounds 83, 425, 70, 37);
contentPane.add(btnRa);

JButton button_47 = new JButton "89-103";
button_47.setFont new Font "Georgia", Font BOLD, 13));
button_47.setBackground new Color(255, 0, 0));
button_47.setBounds 156, 425, 70, 37);
contentPane.add(button_47);

JButton btnRf = new JButton "Rf";
btnRf.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(103).toString());
        text.setVisible(true);
    }
};

btnRf.setForeground(new Color 0, 206, 209);
btnRf.setFont new Font "Georgia", Font BOLD, 17);
btnRf.setBackground UIManager.getColor("Button.background"));
btnRf.setBounds 228, 425, 70, 37);
contentPane.add(btnRf);

JButton btnDb = new JButton("Db");

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```

btnDb.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(104).toString());
        text.setVisible(true);
    }
};

btnDb.setForeground new Color(0, 204, 204);
btnDb.setFont new Font("Georgia", Font.BOLD, 17);
btnDb.setBackground UIManager.getColor("Button.background");
btnDb.setBounds 301, 425, 70, 37;
contentPane.add(btnDb);

JButton btnCr_3 = new JButton("Sg");
btnCr_3.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(105).toString());
        text.setVisible(true);
    }
};

btnCr_3.setForeground new Color(72, 209, 204);
btnCr_3.setFont new Font("Georgia", Font.BOLD, 17);
btnCr_3.setBackground UIManager.getColor("Button.background");
btnCr_3.setBounds 374, 425, 70, 37;
contentPane.add(btnCr_3);

JButton btnCr_22 = new JButton("Bh");
btnCr_22.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(106).toString());
        text.setVisible(true);
    }
};

btnCr_22.setForeground new Color(72, 209, 204);
btnCr_22.setFont new Font("Georgia", Font.BOLD, 17);
btnCr_22.setBackground UIManager.getColor("Button.background");
btnCr_22.setBounds 447, 425, 70, 37;
contentPane.add(btnCr_22);

```

```

JButton btnCr_23 = new JButton("Hs");
btnCr_23 addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(107).toString());
        text.setVisible(true);
    }
};

btnCr_23.setForeground new Color(72, 209, 204);
btnCr_23.setFont new Font "Georgia", Font BOLD, 17);
btnCr_23.setBackground UIManager getColor("Button.background");
btnCr_23.setBounds 519, 425, 70, 37;
contentPane.add(btnCr_23);

JButton btnCr_24 = new JButton("Mt");
btnCr_24 addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(108).toString());
        text.setVisible(true);
    }
};

btnCr_24.setForeground new Color(72, 209, 204);
btnCr_24.setFont new Font "Georgia", Font BOLD, 17);
btnCr_24.setBackground UIManager getColor("Button.background");
btnCr_24.setBounds 592, 425, 70, 37;
contentPane.add(btnCr_24);

JButton btnCr_27 = new JButton("Ds");
btnCr_27.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(109).toString());
        text.setVisible(true);
    }
};

btnCr_27.setForeground new Color(72, 209, 204);
btnCr_27.setFont new Font "Georgia", Font BOLD, 17);
btnCr_27.setBackground UIManager getColor("Button.background");
btnCr_27.setBounds 666, 425, 70, 37;
contentPane.add(btnCr_27);

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```

JButton btnCr_8 = new JButton("Rg");
btnCr_8.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(110).toString());
        text.setVisible(true);
    }
};

btnCr_8.setForeground new Color(72, 209, 204);
btnCr_8.setFont new Font("Georgia", Font.BOLD, 17);
btnCr_8.setBackground UIManager.getColor("Button.background");
btnCr_8.setBounds(739, 425, 70, 37);
contentPane.add(btnCr_8);

JButton btnCr_7 = new JButton("Cn");
btnCr_7.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(111).toString());
        text.setVisible(true);
    }
};

btnCr_7.setForeground new Color(72, 209, 204);
btnCr_7.setFont new Font("Georgia", Font.BOLD, 17);
btnCr_7.setBackground UIManager.getColor("Button.background");
btnCr_7.setBounds(811, 425, 70, 37);
contentPane.add(btnCr_7);

JButton btnNh = new JButton("Nh");
btnNh.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(112).toString());
        text.setVisible(true);
    }
};

btnNh.setForeground new Color(255, 69, 0);
btnNh.setFont new Font("Georgia", Font.BOLD, 17);
btnNh.setBackground UIManager.getColor("Button.background");
btnNh.setBounds(884, 425, 70, 37);

```

```

contentPane.add(btnNh);

JButton btnFl = new JButton("Fl");
btnFl.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(113).toString());
        text.setVisible(true);
    }
};

btnFl.setForeground new Color(255, 69, 0);
btnFl.setFont new Font("Georgia", Font.BOLD, 17);
btnFl.setBackground UIManager.getColor("Button.background");
btnFl.setBounds 957, 425, 70, 37;
contentPane.add(btnFl);

JButton btnMc = new JButton("Mc");
btnMc.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(114).toString());
        text.setVisible(true);
    }
};

btnMc.setForeground new Color(255, 69, 0);
btnMc.setFont new Font("Georgia", Font.BOLD, 17);
btnMc.setBackground UIManager.getColor("Button.background");
btnMc.setBounds 1030, 425, 70, 37;
contentPane.add(btnMc);

JButton btnLv = new JButton("Lv");
btnLv.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(115).toString());
        text.setVisible(true);
    }
};

btnLv.setForeground new Color(255, 69, 0);
btnLv.setFont new Font("Georgia", Font.BOLD, 17);
btnLv.setBackground UIManager.getColor("Button.background"));

```

```

btnLv.setBounds(1103, 425, 70, 37);
contentPane.add(btnLv);

JButton btnTs = new JButton "Ts";
btnTs.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 116).toString());
        text.setVisible(true);
    }
};

btnTs.setForeground new Color 255, 204, 51);
btnTs.setFont new Font "Georgia", Font.BOLD, 17);
btnTs.setBackground UIManager.getColor "Button.background");
btnTs.setBounds(1176, 425, 70, 37);
contentPane.add(btnTs);

JButton btnPb = new JButton "Pb";
btnPb.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 81).toString());
        text.setVisible(true);
    }
};

btnPb.setForeground new Color 255, 69, 0);
btnPb.setFont new Font "Georgia", Font.BOLD, 17);
btnPb.setBackground UIManager.getColor "Button.background");
btnPb.setBounds(957, 372, 70, 37);
contentPane.add(btnPb);

JButton btnBi = new JButton "Bi";
btnBi.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 82).toString());
        text.setVisible(true);
    }
};

btnBi.setForeground new Color 255, 69, 0);
btnBi.setFont new Font "Georgia", Font.BOLD, 17));

```

```

btnBi.setBackground UIManager.getColor("Button.background");
btnBi.setBounds(1030, 372, 70, 37);
contentPane.add(btnBi);

JButton btnPo = new JButton "Po";
btnPo.addActionListener new ActionListener {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(83).toString());
        text.setVisible(true);
    }
};
btnPo.setForeground new Color(51, 204, 0);
btnPo.setFont new Font("Georgia", Font.BOLD, 17);
btnPo.setBackground UIManager.getColor("Button.background");
btnPo.setBounds(1103, 372, 70, 37);
contentPane.add(btnPo);

JButton btnAt = new JButton "At";
btnAt.addActionListener new ActionListener {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(84).toString());
        text.setVisible(true);
    }
};
btnAt.setForeground new Color(255, 204, 51);
btnAt.setFont new Font("Georgia", Font.BOLD, 17);
btnAt.setBackground UIManager.getColor("Button.background");
btnAt.setBounds(1176, 372, 70, 37);
contentPane.add(btnAt);

JButton btnXe = new JButton "Xe";
btnXe.addActionListener new ActionListener {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(53).toString());
        text.setVisible(true);
    }
};
btnXe.setForeground new Color(255, 255, 0);

```

```

btnXe.setFont new Font "Georgia", Font.BOLD, 17);
btnXe.setBackground UIManager.getColor "Button.background");
btnXe.setBounds 1249, 319, 70, 37);
contentPane.add(btnXe);

JButton btnRn = new JButton "Rn";
btnRn.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 85).toString());
        text.setVisible(true);
    }
);
btnRn.setForeground new Color 255, 255, 0);
btnRn.setFont new Font "Georgia", Font.BOLD, 17);
btnRn.setBackground UIManager.getColor "Button.background");
btnRn.setBounds 1249, 372, 70, 37);
contentPane.add(btnRn);

JButton btnOg = new JButton "Og";
btnOg.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 117).toString());
        text.setVisible(true);
    }
);
btnOg.setForeground new Color 255, 255, 0 );
btnOg.setFont new Font "Georgia", Font.BOLD, 17);
btnOg.setBackground UIManager.getColor "Button.background");
btnOg.setBounds 1249, 425, 70, 37);
contentPane.add(btnOg);

JButton btnMg = new JButton "Mg";
btnMg.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 11).toString());
        text.setVisible(true);
    }
);

```

```

btnMg.setForeground(new Color(128, 0, 128));
btnMg.setFont(new Font("Georgia", Font.BOLD, 17));
btnMg.setBackground(UIManager.getColor("Button.background"));
btnMg.setBounds(83, 213, 70, 37);
contentPane.add(btnMg);

JButton btnBe = new JButton("Be");
btnBe.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(3).toString());
        text.setVisible(true);
    }
});
btnBe.setForeground(new Color(128, 0, 128));
btnBe.setFont(new Font("Georgia", Font.BOLD, 17));
btnBe.setBackground(UIManager.getColor("Button.background"));
btnBe.setBounds(83, 161, 70, 37);
contentPane.add(btnBe);

JButton btnAr = new JButton("Ar");
btnAr.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(17).toString());
        text.setVisible(true);
    }
});
btnAr.setForeground(new Color(255, 255, 0));
btnAr.setFont(new Font("Georgia", Font.BOLD, 17));
btnAr.setBackground(UIManager.getColor("Button.background"));
btnAr.setBounds(1249, 213, 70, 37);
contentPane.add(btnAr);

JButton btnCl = new JButton("Cl");
btnCl.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(16).toString());
        text.setVisible(true);
    }
});

```

```

    );
    btnCl.setForeground new Color(255, 204, 51);
    btnCl.setFont new Font("Georgia", Font.BOLD, 17);
    btnCl.setBackground UIManager.getColor("Button.background"));
    btnCl.setBounds(1176, 213, 70, 37);
    contentPane.add(btnCl);

    JButton btnNe = new JButton("Ne");
    btnNe.addActionListener new ActionListener(){
        public void actionPerformed(ActionEvent e){
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(9).toString());
            text.setVisible(true);
        }
    );
    btnNe.setForeground new Color(255, 255, 0);
    btnNe.setFont new Font("Georgia", Font.BOLD, 17);
    btnNe.setBackground UIManager.getColor("Button.background"));
    btnNe.setBounds(1249, 161, 70, 37);
    contentPane.add(btnNe);

    JButton btnF = new JButton("F");
    btnF.addActionListener new ActionListener(){
        public void actionPerformed(ActionEvent e){
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(8).toString());
            text.setVisible(true);
        }
    );
    btnF.setForeground new Color(255, 204, 51);
    btnF.setFont new Font("Georgia", Font.BOLD, 17);
    btnF.setBackground UIManager.getColor("Button.background"));
    btnF.setBounds(1176, 161, 70, 37);
    contentPane.add(btnF);

    JButton btnS = new JButton("S");
    btnS.addActionListener new ActionListener(){
        public void actionPerformed(ActionEvent e){
            ArrayList<Element> list = new ArrayList<>();
            ArrayElements elements = new ArrayElements();
            list = elements.getList();

            Text text = new Text(list.get(15).toString());
            text.setVisible(true);
        }
    );

```

```

        }

    );
    btnS.setForeground new Color(51, 0, 204);
    btnS.setFont new Font "Georgia", Font BOLD, 17);
    btnS.setBackground UIManager getColor"Button.background");
    btnS.setBounds 1103, 213, 70, 37);
    contentPane.add(btnS);

JButton btnP = new JButton "P";
btnP.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 14).toString());
        text.setVisible(true);
    }
};

btnP.setForeground new Color(51, 0, 204);
btnP.setFont new Font "Georgia", Font BOLD, 17);
btnP.setBackground UIManager getColor"Button.background");
btnP.setBounds 1030, 213, 70, 37);
contentPane.add(btnP);

JButton btnSi = new JButton "Si";
btnSi.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 13).toString());
        text.setVisible(true);
    }
};

btnSi.setForeground new Color 51, 204, 0);
btnSi.setFont new Font "Georgia", Font BOLD, 17);
btnSi.setBackground UIManager getColor"Button.background");
btnSi.setBounds 957, 213, 70, 37);
contentPane.add(btnSi);

JButton btnAI = new JButton "AI";
btnAI.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();
    }
};

```

```

        Text text = new Text(list.get(12).toString());
        text.setVisible(true);
    }
}

btnAI.setForeground new Color 255, 69, 0;
btnAI.setFont new Font "Georgia", Font BOLD, 17);
btnAI.setBackground UIManager.getColor "Button.background");
btnAI.setBounds 884, 213, 70, 37;
contentPane.add(btnAI);

JButton btnO = new JButton "O";
btnO.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(7).toString());
        text.setVisible(true);
    }
}
btnO.setForeground new Color 51, 0, 204);
btnO.setFont new Font "Georgia", Font BOLD, 17);
btnO.setBackground UIManager.getColor "Button.background");
btnO.setBounds 1103, 161, 70, 37;
contentPane.add(btnO);

JButton btnN = new JButton "N";
btnN.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(6).toString());
        text.setVisible(true);
    }
}
btnN.setForeground new Color 51, 0, 204);
btnN.setFont new Font "Georgia", Font BOLD, 17);
btnN.setBackground UIManager.getColor "Button.background");
btnN.setBounds 1030, 161, 70, 37;
contentPane.add(btnN);

JButton btnC = new JButton "C";
btnC.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();

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```

        list = elements.getList();

        Text text = new Text(list.get(5).toString());
        text.setVisible(true);
    }

};

btnC.setForeground new Color(51, 0, 204);
btnC.setFont new Font "Georgia", Font.BOLD, 17;
btnC.setBackground UIManager.getColor "Button.background");
btnC.setBounds(957, 161, 70, 37);
contentPane.add(btnC);

JButton btnB = new JButton "B";
btnB.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(4).toString());
        text.setVisible(true);
    }

};

btnB.setForeground new Color(51, 204, 0 );
btnB.setFont new Font "Georgia", Font.BOLD, 17);
btnB.setBackground UIManager.getColor "Button.background");
btnB.setBounds 884, 161, 70, 37);
contentPane.add(btnB);

JButton btnHe = new JButton "He";
btnHe.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(1).toString());
        text.setVisible(true);
    }

};

btnHe.setForeground new Color(255, 255, 0);
btnHe.setFont new Font "Georgia", Font.BOLD, 17);
btnHe.setBackground UIManager.getColor "Button.background");
btnHe.setBounds(1249, 107, 70, 37);
contentPane.add(btnHe);

JLabel lblL = new JLabel "Lanthanide";
lblL.setFont(new Font "Georgia", Font.BOLD, 14);

```

```

lblL.setBounds(10, 509, 86, 14);
contentPane.add(lblL);

JLabel lblSeries = new JLabel "Series";
lblSeries.setFont new Font "Georgia", Font.BOLD, 14));
lblSeries.setBounds 20, 522, 46, 24;
contentPane.add(lblSeries);

JLabel label_1 = new JLabel "Series";
label_1.setFont new Font "Georgia", Font.BOLD, 14);
label_1.setBounds 20, 598, 46, 24);
contentPane.add(label_1);

JLabel lblActinide = new JLabel "Actinide";
lblActinide.setFont new Font "Georgia", Font.BOLD, 14);
lblActinide.setBounds(10, 585, 86, 14);
contentPane.add(lblActinide);

JButton btnLa = new JButton "La";
btnLa.addActionListener new ActionListener{
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(56).toString());
        text.setVisible(true);
    }
};
btnLa.setForeground new Color(51, 255, 0);
btnLa.setFont new Font "Georgia", Font.BOLD, 17);
btnLa.setBackground UIManager.getColor "Button.background");
btnLa.setBounds(112, 509, 70, 37);
contentPane.add(btnLa);

JButton btnCe = new JButton "Ce";
btnCe.addActionListener new ActionListener{
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(57).toString());
        text.setVisible(true);
    }
};
btnCe.setForeground new Color(51, 255, 0);
btnCe.setFont new Font "Georgia", Font.BOLD, 17);
btnCe.setBackground UIManager.getColor "Button.background");

```

```

btnCe.setBounds(185, 509, 70, 37);
contentPane.add(btnCe);

JButton btnAc = new JButton "Ac";
btnAc.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 88).toString());
        text.setVisible(true);
    }
};

btnAc.setForeground new Color(255, 0, 0);
btnAc.setFont new Font "Georgia", Font.BOLD, 17);
btnAc.setBackground UIManager.getColor "Button.background");
btnAc.setBounds(112, 574, 70, 37);
contentPane.add(btnAc);

JButton btnTh = new JButton "Th";
btnTh.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 89).toString());
        text.setVisible(true);
    }
};

btnTh.setForeground new Color(255, 0, 0);
btnTh.setFont new Font "Georgia", Font.BOLD, 17);
btnTh.setBackground UIManager.getColor "Button.background");
btnTh.setBounds(185, 574, 70, 37);
contentPane.add(btnTh);

JButton btnPr = new JButton "Pr";
btnPr.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 58).toString());
        text.setVisible(true);
    }
};

btnPr.setForeground new Color(51, 255, 0);
btnPr.setFont new Font "Georgia", Font.BOLD, 17);

```

```

btnPr.setBackground UIManager.getColor("Button.background");
btnPr.setBounds 257, 509, 70, 37;
contentPane.add(btnPr);

JButton btnNd = new JButton "Nd";
btnNd.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 59).toString();
        text.setVisible(true);
    }
};

btnNd.setForeground new Color 51, 255, 0);
btnNd.setFont new Font "Georgia", Font BOLD, 17);
btnNd.setBackground UIManager.getColor "Button.background");
btnNd.setBounds 330, 509, 70, 37);
contentPane.add(btnNd);

JButton btnPa = new JButton "Pa";
btnPa.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 90).toString();
        text.setVisible(true);
    }
};

btnPa.setForeground new Color 255, 0, 0);
btnPa.setFont new Font "Georgia", Font BOLD, 17);
btnPa.setBackground UIManager.getColor "Button.background");
btnPa.setBounds 257, 574, 70, 37);
contentPane.add(btnPa);

JButton btnU = new JButton "U";
btnU.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 91).toString();
        text.setVisible(true);
    }
};

btnU.setForeground new Color 255, 0, 0);

```

```

btnU.setFont new Font "Georgia", Font.BOLD, 17);
btnU.setBackground UIManager.getColor "Button.background");
btnU.setBounds 330, 574, 70, 37);
contentPane.add(btnU);

JButton btnSm = new JButton "Sm";
btnSm.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 61).toString());
        text.setVisible(true);
    }
);
btnSm.setForeground new Color(51, 255, 0);
btnSm.setFont new Font "Georgia", Font.BOLD, 17);
btnSm.setBackground UIManager.getColor "Button.background");
btnSm.setBounds 475, 509, 70, 37);
contentPane.add(btnSm);

JButton btnPm = new JButton "Pm";
btnPm.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 60).toString());
        text.setVisible(true);
    }
);
btnPm.setForeground new Color(51, 255, 0);
btnPm.setFont new Font "Georgia", Font.BOLD, 17);
btnPm.setBackground UIManager.getColor "Button.background");
btnPm.setBounds 402, 509, 70, 37);
contentPane.add(btnPm);

JButton btnGd = new JButton "Gd";
btnGd.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 63).toString());
        text.setVisible(true);
    }
);

```

```

btnGd.setForeground new Color(51, 255, 0);
btnGd.setFont new Font("Georgia", Font.BOLD, 17);
btnGd.setBackground UIManager.getColor("Button.background"));
btnGd.setBounds 621, 509, 70, 37;
contentPane.add(btnGd);

JButton btnEu = new JButton("Eu");
btnEu.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(62).toString());
        text.setVisible(true);
    }
};

btnEu.setForeground new Color(51, 255, 0);
btnEu.setFont new Font("Georgia", Font.BOLD, 17);
btnEu.setBackground UIManager.getColor("Button.background"));
btnEu.setBounds 548, 509, 70, 37;
contentPane.add(btnEu);

JButton btnDy = new JButton("Dy");
btnDy.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(65).toString());
        text.setVisible(true);
    }
};

btnDy.setForeground new Color(51, 255, 0);
btnDy.setFont new Font("Georgia", Font.BOLD, 17);
btnDy.setBackground UIManager.getColor("Button.background"));
btnDy.setBounds 768, 509, 70, 37;
contentPane.add(btnDy);

JButton btnTb = new JButton("Tb");
btnTb.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(64).toString());
        text.setVisible(true);
    }
};

```

```

    );
    btnTb.setForeground new Color 51, 255, 0);
    btnTb.setFont new Font "Georgia", Font BOLD, 17);
    btnTb.setBackground UIManager.getColor "Button.background");
    btnTb.setBounds 695, 509, 70, 37);
    contentPane.add(btnTb);

JButton btnEr = new JButton "Er";
btnEr.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 67).toString());
        text.setVisible(true);
    }
);
btnEr.setForeground new Color 51, 255, 0);
btnEr.setFont new Font "Georgia", Font BOLD, 17);
btnEr.setBackground UIManager.getColor "Button.background");
btnEr.setBounds 913, 509, 70, 37);
contentPane.add(btnEr);

JButton btnHo = new JButton "Ho";
btnHo.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 66).toString());
        text.setVisible(true);
    }
);
btnHo.setForeground new Color 51, 255, 0);
btnHo.setFont new Font "Georgia", Font BOLD, 17);
btnHo.setBackground UIManager.getColor "Button.background");
btnHo.setBounds 840, 509, 70, 37);
contentPane.add(btnHo);

JButton btnYb = new JButton "Yb";
btnYb.addActionListener new ActionListener {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 69).toString());
        text.setVisible(true);
    }
);

```

```

        }
    );
    btnYb.setForeground new Color(51, 255, 0);
    btnYb.setFont new Font("Georgia", Font.BOLD, 17);
    btnYb.setBackground UIManager.getColor("Button.background"));
    btnYb.setBounds(1059, 509, 70, 37);
    contentPane.add(btnYb);

JButton btnTm = new JButton("Tm");
btnTm.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(68).toString());
        text.setVisible(true);
    }
};
btnTm.setForeground new Color(51, 255, 0);
btnTm.setFont new Font("Georgia", Font.BOLD, 17);
btnTm.setBackground UIManager.getColor("Button.background"));
btnTm.setBounds(986, 509, 70, 37);
contentPane.add(btnTm);

JButton btnAm = new JButton("Pu");
btnAm.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(93).toString());
        text.setVisible(true);
    }
};
btnAm.setForeground new Color(255, 0, 0);
btnAm.setFont new Font("Georgia", Font.BOLD, 17);
btnAm.setBackground UIManager.getColor("Button.background"));
btnAm.setBounds(475, 574, 70, 37);
contentPane.add(btnAm);

JButton btnNp = new JButton("Np");
btnNp.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(92).toString());
    }
};

```

```

        text.setVisible(true);
    }
}

btnNp.setForeground new Color 255, 0, 0);
btnNp.setFont new Font "Georgia", Font BOLD, 17);
btnNp.setBackground UIManager.getColor "Button.background");
btnNp.setBounds 402, 574, 70, 37);
contentPane.add(btnNp);

JButton btnCm = new JButton "Cm";
btnCm.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 95).toString());
        text.setVisible(true);
    }
}
btnCm.setForeground new Color 255, 0, 0);
btnCm.setFont new Font "Georgia", Font BOLD, 17);
btnCm.setBackground UIManager.getColor "Button.background");
btnCm.setBounds 621, 574, 70, 37);
contentPane.add(btnCm);

JButton btnAm_1 = new JButton "Am";
btnAm_1.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 94).toString());
        text.setVisible(true);
    }
}
btnAm_1.setForeground new Color 255, 0, 0);
btnAm_1.setFont new Font "Georgia", Font BOLD, 17);
btnAm_1.setBackground UIManager.getColor "Button.background");
btnAm_1.setBounds 548, 574, 70, 37);
contentPane.add(btnAm_1);

JButton btnCf = new JButton "Cf";
btnCf.addActionListener new ActionListener{
    public void actionPerformed ActionEvent e{
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();
    }
}

```

```

        Text text = new Text(list.get(97).toString());
        text.setVisible(true);
    }
}

btnCf.setForeground(new Color(255, 0, 0));
btnCf.setFont(new Font("Georgia", Font.BOLD, 17));
btnCf.setBackground(UIManager.getColor("Button.background"));
btnCf.setBounds(768, 574, 70, 37);
contentPane.add(btnCf);

JButton btnBk = new JButton("Bk");
btnBk.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(96).toString());
        text.setVisible(true);
    }
});

btnBk.setForeground(new Color(255, 0, 0));
btnBk.setFont(new Font("Georgia", Font.BOLD, 17));
btnBk.setBackground(UIManager.getColor("Button.background"));
btnBk.setBounds(695, 574, 70, 37);
contentPane.add(btnBk);

JButton btnFm = new JButton("Fm");
btnFm.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(99).toString());
        text.setVisible(true);
    }
});

btnFm.setForeground(new Color(255, 0, 0));
btnFm.setFont(new Font("Georgia", Font.BOLD, 17));
btnFm.setBackground(UIManager.getColor("Button.background"));
btnFm.setBounds(913, 574, 70, 37);
contentPane.add(btnFm);

JButton btnEs = new JButton("Es");
btnEs.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();
    }
});

```

```

        Text text = new Text(list.get 98).toString());
        text.setVisible(true);
    }

};

btnEs.setForeground new Color(255, 0, 0);
btnEs.setFont new Font "Georgia", Font BOLD, 17);
btnEs.setBackground UIManager.getColor("Button.background"));
btnEs.setBounds 840, 574, 70, 37);
contentPane.add(btnEs);

JButton btnNo = new JButton "No";
btnNo.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 101).toString());
        text.setVisible(true);
    }

};

btnNo.setForeground new Color 255, 0, 0);
btnNo.setFont new Font "Georgia", Font BOLD, 17);
btnNo.setBackground UIManager.getColor "Button.background");
btnNo.setBounds 1059, 574, 70, 37);
contentPane.add(btnNo);

JButton btnMd = new JButton "Md";
btnMd.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get 100 .toString());
        text.setVisible(true);
    }

};

btnMd.setForeground new Color(255, 0, 0);
btnMd.setFont new Font "Georgia", Font BOLD, 17);
btnMd.setBackground UIManager.getColor("Button.background"));
btnMd.setBounds 986, 574, 70, 37);
contentPane.add(btnMd);

JButton btnLu = new JButton "Lu";
btnLu.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();

```

```

list = elements.getList();

Text text = new Text(list.get(70).toString());
text.setVisible(true);
}

};

btnLu.setForeground new Color(51, 255, 0);
btnLu.setFont new Font("Georgia", Font.BOLD, 17);
btnLu.setBackground UIManager.getColor("Button.background"));
btnLu.setBounds(1133, 509, 70, 37);
contentPane.add(btnLu);

JButton btnLr = new JButton("Lr");
btnLr.addActionListener new ActionListener(){
    public void actionPerformed(ActionEvent e){
        ArrayList<Element> list = new ArrayList<>();
        ArrayElements elements = new ArrayElements();
        list = elements.getList();

        Text text = new Text(list.get(102).toString());
        text.setVisible(true);
    }
};

btnLr.setForeground new Color(255, 0, 0);
btnLr.setFont new Font("Georgia", Font.BOLD, 17);
btnLr.setBackground UIManager.getColor("Button.background"));
btnLr.setBounds(1133, 574, 70, 37);
contentPane.add(btnLr);

JLabel lblBeryllium = new JLabel("Beryllium");
lblBeryllium.setFont new Font("Georgia", Font.PLAIN, 11));
lblBeryllium.setBounds(83, 197, 70, 14);
contentPane.add(lblBeryllium);

JLabel lblMag = new JLabel("Magnesium");
lblMag.setFont new Font("Georgia", Font.PLAIN, 11));
lblMag.setBounds(83, 250, 70, 14);
contentPane.add(lblMag);

JLabel lblCalcium = new JLabel("Calcium");
lblCalcium.setFont new Font("Georgia", Font.PLAIN, 11));
lblCalcium.setBounds(83, 302, 70, 14);
contentPane.add(lblCalcium);

JLabel lblStrontium = new JLabel("Strontium");
lblStrontium.setFont new Font("Georgia", Font.PLAIN, 11));
lblStrontium.setBounds(83, 356, 70, 14);
contentPane.add(lblStrontium);

```

```
JLabel lblBarium = new JLabel("Barium");
lblBarium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblBarium.setBounds(83, 408, 70, 14);
contentPane.add(lblBarium);

JLabel lblRadium = new JLabel("Radium");
lblRadium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblRadium.setBounds(83, 462, 70, 14);
contentPane.add(lblRadium);

JLabel lblScandium = new JLabel("Scandium");
lblScandium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblScandium.setBounds(156, 302, 70, 14);
contentPane.add(lblScandium);

JLabel lblYttrium = new JLabel("Yttrium");
lblYttrium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblYttrium.setBounds(156, 356, 70, 14);
contentPane.add(lblYttrium);

JLabel lblTitanium = new JLabel("Titanium");
lblTitanium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblTitanium.setBounds(229, 302, 70, 14);
contentPane.add(lblTitanium);

JLabel lblZirconium = new JLabel("Zirconium");
lblZirconium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblZirconium.setBounds(229, 356, 70, 14);
contentPane.add(lblZirconium);

JLabel lblHafnium = new JLabel("Hafnium");
lblHafnium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblHafnium.setBounds(229, 408, 70, 14);
contentPane.add(lblHafnium);

JLabel lblRutherfordium = new JLabel("Rutherfordium");
lblRutherfordium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblRutherfordium.setBounds(205, 462, 94, 14);
contentPane.add(lblRutherfordium);

JLabel lblVabadium = new JLabel("Vabadium");
lblVabadium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblVabadium.setBounds(301, 302, 70, 14);
contentPane.add(lblVabadium);

JLabel lblZirconium_1 = new JLabel("Niobium");
lblZirconium_1.setFont(new Font("Georgia", Font.PLAIN, 11));
lblZirconium_1.setBounds(301, 356, 70, 14);
contentPane.add(lblZirconium_1);
```

```
JLabel lblTantalum = new JLabel "Tantalum";
lblTantalum.setFont new Font "Georgia", Font.PLAIN, 11);
lblTantalum.setBounds 301, 408, 70, 14;
contentPane.add(lblTantalum);

JLabel lblDubnium = new JLabel "Dubnium";
lblDubnium.setFont new Font "Georgia", Font.PLAIN, 11);
lblDubnium.setBounds(301, 462, 70, 14);
contentPane.add(lblDubnium);

JLabel lblChromium = new JLabel "Chromium";
lblChromium.setFont new Font "Georgia", Font.PLAIN, 11);
lblChromium.setBounds 374, 302, 70, 14;
contentPane.add(lblChromium);

JLabel lblMolybdenum = new JLabel "Molybdenum";
lblMolybdenum.setFont new Font "Georgia", Font.PLAIN, 11);
lblMolybdenum.setBounds 364, 356, 80, 14;
contentPane.add(lblMolybdenum);

JLabel lblTungsten = new JLabel "Tungsten";
lblTungsten.setFont new Font "Georgia", Font.PLAIN, 11);
lblTungsten.setBounds 374, 408, 70, 14;
contentPane.add(lblTungsten);

JLabel lblSeaborgium = new JLabel "Seaborgium";
lblSeaborgium.setFont new Font "Georgia", Font.PLAIN, 11);
lblSeaborgium.setBounds 374, 462, 70, 14;
contentPane.add(lblSeaborgium);

JLabel lblManganese = new JLabel "Manganese";
lblManganese.setFont new Font "Georgia", Font.PLAIN, 11);
lblManganese.setBounds 446, 302, 70, 14;
contentPane.add(lblManganese);

JLabel lblTechnetium = new JLabel "Technetium";
lblTechnetium.setFont new Font "Georgia", Font.PLAIN, 11);
lblTechnetium.setBounds 446, 356, 80, 14;
contentPane.add(lblTechnetium);

JLabel lblRhenium = new JLabel "Rhenium";
lblRhenium.setFont new Font "Georgia", Font.PLAIN, 11);
lblRhenium.setBounds 446, 408, 70, 14;
contentPane.add(lblRhenium);

JLabel lblBohrium = new JLabel " Bohrium";
lblBohrium.setFont new Font "Georgia", Font.PLAIN, 11);
lblBohrium.setBounds 446, 462, 70, 14);
```

```
contentPane.add(lblBohrium);

JLabel lblIron = new JLabel("Iron");
lblIron.setFont(new Font("Georgia", Font.PLAIN, 11));
lblIron.setBounds(519, 302, 70, 14);
contentPane.add(lblIron);

JLabel lblRuthenium = new JLabel("Ruthenium");
lblRuthenium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblRuthenium.setBounds(519, 356, 70, 14);
contentPane.add(lblRuthenium);

JLabel lblOsmium = new JLabel("Osmium");
lblOsmium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblOsmium.setBounds(519, 408, 70, 14);
contentPane.add(lblOsmium);

JLabel lblHassium = new JLabel("Hassium");
lblHassium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblHassium.setBounds(519, 462, 70, 14);
contentPane.add(lblHassium);

JLabel lblCobalt = new JLabel("Cobalt");
lblCobalt.setFont(new Font("Georgia", Font.PLAIN, 11));
lblCobalt.setBounds(592, 302, 70, 14);
contentPane.add(lblCobalt);

JLabel lblRhodium = new JLabel("Rhodium");
lblRhodium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblRhodium.setBounds(592, 356, 70, 14);
contentPane.add(lblRhodium);

JLabel lblIridium = new JLabel("Iridium");
lblIridium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblIridium.setBounds(592, 408, 70, 14);
contentPane.add(lblIridium);

JLabel lblMeitnerium = new JLabel("Meitnerium");
lblMeitnerium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblMeitnerium.setBounds(592, 462, 70, 14);
contentPane.add(lblMeitnerium);

JLabel lblNickel = new JLabel("Nickel");
lblNickel.setFont(new Font("Georgia", Font.PLAIN, 11));
lblNickel.setBounds(665, 302, 70, 14);
contentPane.add(lblNickel);

JLabel lblPalladium = new JLabel("Palladium");
lblPalladium.setFont(new Font("Georgia", Font.PLAIN, 11));
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```
lblPalladium.setBounds(665, 356, 70, 14);
contentPane.add(lblPalladium);

JLabel lblPlatinum = new JLabel("Platinum");
lblPlatinum.setFont(new Font("Georgia", Font.PLAIN, 11));
lblPlatinum.setBounds(665, 408, 70, 14);
contentPane.add(lblPlatinum);

JLabel lblDarmstadtium_1 = new JLabel("Darmstadtium");
lblDarmstadtium_1.setFont(new Font("Georgia", Font.PLAIN, 11));
lblDarmstadtium_1.setBounds(665, 462, 70, 14);
contentPane.add(lblDarmstadtium_1);

JLabel lblCopper = new JLabel("Copper");
lblCopper.setFont(new Font("Georgia", Font.PLAIN, 11));
lblCopper.setBounds(739, 302, 70, 14);
contentPane.add(lblCopper);

JLabel lblSilver = new JLabel("Silver");
lblSilver.setFont(new Font("Georgia", Font.PLAIN, 11));
lblSilver.setBounds(739, 356, 70, 14);
contentPane.add(lblSilver);

JLabel lblGold = new JLabel("Gold");
lblGold.setFont(new Font("Georgia", Font.PLAIN, 11));
lblGold.setBounds(739, 408, 70, 14);
contentPane.add(lblGold);

JLabel lblRoentgenium = new JLabel("Roentgenium");
lblRoentgenium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblRoentgenium.setBounds(739, 462, 70, 14);
contentPane.add(lblRoentgenium);

JLabel lblZinc = new JLabel("Zinc");
lblZinc.setFont(new Font("Georgia", Font.PLAIN, 11));
lblZinc.setBounds(812, 302, 70, 14);
contentPane.add(lblZinc);

JLabel lblCadmium = new JLabel("Cadmium");
lblCadmium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblCadmium.setBounds(812, 356, 70, 14);
contentPane.add(lblCadmium);

JLabel lblMercury = new JLabel("Mercury");
lblMercury.setFont(new Font("Georgia", Font.PLAIN, 11));
lblMercury.setBounds(812, 408, 70, 14);
contentPane.add(lblMercury);

JLabel lblCopernicium = new JLabel("Copernicium");
```

```
lblCopernicium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblCopernicium.setBounds(812, 462, 70, 14);
contentPane.add(lblCopernicium);

JLabel lblBoron = new JLabel("Boron");
lblBoron.setFont(new Font("Georgia", Font.PLAIN, 11));
lblBoron.setBounds(884, 197, 70, 14);
contentPane.add(lblBoron);

JLabel lblAluminium = new JLabel("Aluminium");
lblAluminium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblAluminium.setBounds(884, 250, 70, 14);
contentPane.add(lblAluminium);

JLabel lblGallium = new JLabel("Gallium");
lblGallium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblGallium.setBounds(884, 302, 70, 14);
contentPane.add(lblGallium);

JLabel lblIndium = new JLabel("Indium");
lblIndium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblIndium.setBounds(884, 356, 70, 14);
contentPane.add(lblIndium);

JLabel lblThallium = new JLabel("Thallium");
lblThallium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblThallium.setBounds(884, 408, 70, 14);
contentPane.add(lblThallium);

JLabel lblNihonium = new JLabel("Nihonium");
lblNihonium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblNihonium.setBounds(884, 462, 70, 14);
contentPane.add(lblNihonium);

JLabel lblCarbon = new JLabel("Carbon");
lblCarbon.setFont(new Font("Georgia", Font.PLAIN, 11));
lblCarbon.setBounds(957, 197, 70, 14);
contentPane.add(lblCarbon);

JLabel lblSilicon = new JLabel("Silicon");
lblSilicon.setFont(new Font("Georgia", Font.PLAIN, 11));
lblSilicon.setBounds(957, 250, 70, 14);
contentPane.add(lblSilicon);

JLabel lblGermanium = new JLabel("Germanium");
lblGermanium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblGermanium.setBounds(957, 302, 70, 14);
contentPane.add(lblGermanium);
```

```
JLabel lblTin = new JLabel("Tin");
lblTin.setFont(new Font("Georgia", Font.PLAIN, 11));
lblTin.setBounds(957, 356, 70, 14);
contentPane.add(lblTin);

JLabel lblLead = new JLabel("Lead");
lblLead.setFont(new Font("Georgia", Font.PLAIN, 11));
lblLead.setBounds(957, 408, 70, 14);
contentPane.add(lblLead);

JLabel lblFlerovium = new JLabel("Flerovium");
lblFlerovium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblFlerovium.setBounds(957, 462, 70, 14);
contentPane.add(lblFlerovium);

JLabel lblNitrogen = new JLabel("Nitrogen");
lblNitrogen.setFont(new Font("Georgia", Font.PLAIN, 11));
lblNitrogen.setBounds(1030, 197, 70, 14);
contentPane.add(lblNitrogen);

JLabel lblPhosphorus = new JLabel("Phosphorus");
lblPhosphorus.setFont(new Font("Georgia", Font.PLAIN, 11));
lblPhosphorus.setBounds(1030, 250, 70, 14);
contentPane.add(lblPhosphorus);

JLabel lblArsenic = new JLabel("Arsenic");
lblArsenic.setFont(new Font("Georgia", Font.PLAIN, 11));
lblArsenic.setBounds(1030, 302, 70, 14);
contentPane.add(lblArsenic);

JLabel lblAntimony = new JLabel("Antimony");
lblAntimony.setFont(new Font("Georgia", Font.PLAIN, 11));
lblAntimony.setBounds(1030, 356, 70, 14);
contentPane.add(lblAntimony);

JLabel lblBismuth = new JLabel("Bismuth");
lblBismuth.setFont(new Font("Georgia", Font.PLAIN, 11));
lblBismuth.setBounds(1030, 408, 70, 14);
contentPane.add(lblBismuth);

JLabel lblPolonium = new JLabel("Polonium");
lblPolonium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblPolonium.setBounds(1103, 408, 70, 14);
contentPane.add(lblPolonium);

JLabel lblTellurium = new JLabel("Tellurium");
lblTellurium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblTellurium.setBounds(1103, 356, 70, 14);
contentPane.add(lblTellurium);
```

```
JLabel lblSelenium = new JLabel "Selenium";
lblSelenium.setFont new Font "Georgia", Font.PLAIN, 11);
lblSelenium.setBounds(1103, 302, 70, 14);
contentPane.add(lblSelenium);

JLabel lblSulfur = new JLabel "Sulfur";
lblSulfur.setFont new Font "Georgia", Font.PLAIN, 11);
lblSulfur.setBounds(1103, 250, 70, 14);
contentPane.add(lblSulfur);

JLabel lblOxygen = new JLabel "Oxygen";
lblOxygen.setFont new Font "Georgia", Font.PLAIN, 11);
lblOxygen.setBounds(1103, 197, 70, 14);
contentPane.add(lblOxygen);

JLabel lblFluorine = new JLabel "Fluorine";
lblFluorine.setFont new Font "Georgia", Font.PLAIN, 11);
lblFluorine.setBounds(1176, 197, 70, 14);
contentPane.add(lblFluorine);

JLabel lblChlorine = new JLabel "Chlorine";
lblChlorine.setFont new Font "Georgia", Font.PLAIN, 11);
lblChlorine.setBounds(1176, 250, 70, 14);
contentPane.add(lblChlorine);

JLabel lblBromine = new JLabel "Bromine";
lblBromine.setFont new Font "Georgia", Font.PLAIN, 11);
lblBromine.setBounds(1176, 302, 70, 14);
contentPane.add(lblBromine);

JLabel lblIodine = new JLabel "Iodine";
lblIodine.setFont new Font "Georgia", Font.PLAIN, 11);
lblIodine.setBounds(1176, 356, 70, 14);
contentPane.add(lblIodine);

JLabel lblAstatine = new JLabel "Astatine";
lblAstatine.setFont new Font "Georgia", Font.PLAIN, 11);
lblAstatine.setBounds(1176, 408, 70, 14);
contentPane.add(lblAstatine);

JLabel lblTennessine = new JLabel "Tennessine";
lblTennessine.setFont new Font "Georgia", Font.PLAIN, 11);
lblTennessine.setBounds(1176, 462, 70, 14);
contentPane.add(lblTennessine);

JLabel lblMoscovium = new JLabel "Moscovium";
lblMoscovium.setFont new Font "Georgia", Font.PLAIN, 11);
lblMoscovium.setBounds(1030, 462, 70, 14);
```

```
contentPane.add(lblMoscovium);

JLabel lblLivermorium = new JLabel("Livermorium");
lblLivermorium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblLivermorium.setBounds(1103, 462, 70, 14);
contentPane.add(lblLivermorium);

JLabel lblOganesson = new JLabel("Oganesson");
lblOganesson.setFont(new Font("Georgia", Font.PLAIN, 11));
lblOganesson.setBounds(1249, 462, 70, 14);
contentPane.add(lblOganesson);

JLabel lblRadon = new JLabel("Radon");
lblRadon.setFont(new Font("Georgia", Font.PLAIN, 11));
lblRadon.setBounds(1249, 408, 70, 14);
contentPane.add(lblRadon);

JLabel lblXenon = new JLabel("Xenon");
lblXenon.setFont(new Font("Georgia", Font.PLAIN, 11));
lblXenon.setBounds(1249, 356, 70, 14);
contentPane.add(lblXenon);

JLabel lblKrypton = new JLabel("Krypton");
lblKrypton.setFont(new Font("Georgia", Font.PLAIN, 11));
lblKrypton.setBounds(1248, 302, 70, 14);
contentPane.add(lblKrypton);

JLabel lblArgon = new JLabel("Argon");
lblArgon.setFont(new Font("Georgia", Font.PLAIN, 11));
lblArgon.setBounds(1249, 250, 70, 14);
contentPane.add(lblArgon);

JLabel lblNeon = new JLabel("Neon");
lblNeon.setFont(new Font("Georgia", Font.PLAIN, 11));
lblNeon.setBounds(1248, 197, 70, 14);
contentPane.add(lblNeon);

JLabel lblHelium = new JLabel("Helium");
lblHelium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblHelium.setBounds(1249, 145, 70, 14);
contentPane.add(lblHelium);

JLabel lblLanthanum = new JLabel("Lanthanum");
lblLanthanum.setFont(new Font("Georgia", Font.PLAIN, 11));
lblLanthanum.setBounds(112, 549, 70, 14);
contentPane.add(lblLanthanum);

JLabel lblCerium = new JLabel("Cerium");
lblCerium.setFont(new Font("Georgia", Font.PLAIN, 11));
```

```
lblCerium.setBounds(185, 549, 70, 14);
contentPane.add(lblCerium);

JLabel lblPraseodymium = new JLabel("Praseodymium");
lblPraseodymium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblPraseodymium.setBounds(240, 549, 98, 14);
contentPane.add(lblPraseodymium);

JLabel lblNeodymium = new JLabel("Neodymium");
lblNeodymium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblNeodymium.setBounds(330, 549, 80, 14);
contentPane.add(lblNeodymium);

JLabel lblPromethium = new JLabel("Promethium");
lblPromethium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblPromethium.setBounds(402, 549, 80, 14);
contentPane.add(lblPromethium);

JLabel lblSamarium = new JLabel("Samarium");
lblSamarium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblSamarium.setBounds(485, 549, 70, 14);
contentPane.add(lblSamarium);

JLabel lblEuropium = new JLabel("Europium");
lblEuropium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblEuropium.setBounds(558, 549, 70, 14);
contentPane.add(lblEuropium);

JLabel lblGadolinium = new JLabel("Gadolinium");
lblGadolinium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblGadolinium.setBounds(621, 549, 70, 14);
contentPane.add(lblGadolinium);

JLabel lblTerbium = new JLabel("Terbium");
lblTerbium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblTerbium.setBounds(695, 549, 70, 14);
contentPane.add(lblTerbium);

JLabel lblDysprosium = new JLabel("Dysprosium");
lblDysprosium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblDysprosium.setBounds(768, 549, 70, 14);
contentPane.add(lblDysprosium);

JLabel lblHoimium = new JLabel("Hoimium");
lblHoimium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblHoimium.setBounds(840, 549, 70, 14);
contentPane.add(lblHoimium);

JLabel lblErbium = new JLabel("Erbium");
```

```
lblErbium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblErbium.setBounds(913, 549, 70, 14);
contentPane.add(lblErbium);

JLabel lblThulium = new JLabel("Thulium");
lblThulium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblThulium.setBounds(986, 549, 70, 14);
contentPane.add(lblThulium);

JLabel lblYtterbium = new JLabel("Ytterbium");
lblYtterbium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblYtterbium.setBounds(1059, 549, 70, 14);
contentPane.add(lblYtterbium);

JLabel lblLutetium = new JLabel("Lutetium");
lblLutetium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblLutetium.setBounds(1133, 549, 70, 14);
contentPane.add(lblLutetium);

JLabel lblActinium = new JLabel("Actinium");
lblActinium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblActinium.setBounds(112, 620, 70, 14);
contentPane.add(lblActinium);

JLabel lblThorium = new JLabel("Thorium");
lblThorium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblThorium.setBounds(185, 620, 70, 14);
contentPane.add(lblThorium);

JLabel lblProtactinium = new JLabel("Protactinium");
lblProtactinium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblProtactinium.setBounds(247, 622, 80, 14);
contentPane.add(lblProtactinium);

JLabel lblUranium = new JLabel("Uranium");
lblUranium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblUranium.setBounds(330, 620, 70, 14);
contentPane.add(lblUranium);

JLabel lblNeptunium = new JLabel("Neptunium");
lblNeptunium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblNeptunium.setBounds(402, 620, 70, 14);
contentPane.add(lblNeptunium);

JLabel lblPlutonium = new JLabel("Plutonium");
lblPlutonium.setFont(new Font("Georgia", Font.PLAIN, 11));
lblPlutonium.setBounds(475, 622, 70, 14);
contentPane.add(lblPlutonium);
```

```
JLabel lblAmericium = new JLabel "Americium";
lblAmericium.setFont new Font "Georgia", Font.PLAIN, 11);
lblAmericium.setBounds 548, 622, 70, 14;
contentPane.add(lblAmericium);

JLabel lblCurium = new JLabel "Curium";
lblCurium.setFont new Font "Georgia", Font.PLAIN, 11);
lblCurium.setBounds 621, 622, 70, 14;
contentPane.add(lblCurium);

JLabel lblBerkelium = new JLabel "Berkelium");
lblBerkelium.setFont new Font "Georgia", Font.PLAIN, 11);
lblBerkelium.setBounds 695, 622, 70, 14;
contentPane.add(lblBerkelium);

JLabel lblCalifornium = new JLabel "Californium");
lblCalifornium.setFont new Font "Georgia", Font.PLAIN, 11);
lblCalifornium.setBounds 768, 622, 80, 14;
contentPane.add(lblCalifornium);

JLabel lblEinsteinium = new JLabel "Einsteinium");
lblEinsteinium.setFont new Font "Georgia", Font.PLAIN, 11);
lblEinsteinium.setBounds 840, 622, 86, 14;
contentPane.add(lblEinsteinium);

JLabel lblFerium = new JLabel "Ferium");
lblFerium.setFont new Font "Georgia", Font.PLAIN, 11);
lblFerium.setBounds 923, 622, 70, 14;
contentPane.add(lblFerium);

JLabel lblMendelevium = new JLabel "Mendelevium");
lblMendelevium.setFont new Font "Georgia", Font.PLAIN, 11);
lblMendelevium.setBounds 976, 620, 80, 14;
contentPane.add(lblMendelevium);

JLabel lblNobelium = new JLabel "Nobelium");
lblNobelium.setFont new Font "Georgia", Font.PLAIN, 11);
lblNobelium.setBounds 1059, 622, 70, 14;
contentPane.add(lblNobelium);

JLabel lblLawerncium = new JLabel "Lawerncium");
lblLawerncium.setFont new Font "Georgia", Font.PLAIN, 11);
lblLawerncium.setBounds(1123, 620, 80, 14);
contentPane.add(lblLawerncium);

JButton btnExit = new JButton "EXIT";
btnExit.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        dispose();
    }
}
```

```

        }

    );
    btnExit.setBounds(1230, 637, 89, 23);
    contentPane.add(btnExit);

    JButton btnBack = new JButton("BACK");
    btnBack.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            //Menu menu = new Menu();
            //menu.main(null);
            dispose();
        }
    );
    btnBack.setBounds(1230, 600, 89, 23);
    contentPane.add(btnBack);

    JLabel lblNewLabel_1 = new JLabel(" 1 2 3 4 5
6   7   8   9   10 11 12 13 14 15 16
17   18 ");
    lblNewLabel_1.setForeground(new Color(255, 255, 204));
    lblNewLabel_1.setFont(new Font("Algerian", Font.BOLD, 19));
    lblNewLabel_1.setBounds(10, 86, 1309, 24);
    contentPane.add(lblNewLabel_1);

    JButton btnNewButton = new JButton("Alkaline Earth");
    btnNewButton.setForeground(Color.WHITE);
    btnNewButton.setBackground(new Color(128, 0, 128));
    btnNewButton.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent arg0) {
            JOptionPane.showMessageDialog(null, new
AlkalineEarthMetals().properties());
        }
    );
    btnNewButton.setFont(new Font("Tahoma", Font.BOLD, 11));
    btnNewButton.setBounds(331, 116, 113, 43);
    contentPane.add(btnNewButton);

    JButton button = new JButton("Alkali Metal");
    button.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            JOptionPane.showMessageDialog(null, new
AlkaliMetal().properties());
        }
    );
    button.setForeground(Color.WHITE);
    button.setBackground(Color.MAGENTA);
    button.setFont(new Font("Tahoma", Font.BOLD, 12));
    button.setBounds(205, 116, 112, 43);
    contentPane.add(button);
}

```

```

JButton btnTransitionMetal = new JButton "Transition Metal";
btnTransitionMetal.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        JOptionPane.showMessageDialog null, new
TransitionMetals().properties());
    }
};

btnTransitionMetal.setForeground Color.WHITE;
btnTransitionMetal.setBackground Color.CYAN;
btnTransitionMetal.setFont new Font "Tahoma", Font.BOLD, 12);
btnTransitionMetal.setBounds 460, 116, 113, 43;
contentPane.add(btnTransitionMetal);

JButton btnBasicMetal = new JButton "Basic Metal";
btnBasicMetal.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        JOptionPane.showMessageDialog null, new
BasicMetals().properties());
    }
};

btnBasicMetal.setForeground Color.WHITE;
btnBasicMetal.setBackground new Color 255, 51, 0);
btnBasicMetal.setFont new Font "Tahoma", Font.BOLD, 12);
btnBasicMetal.setBounds 592, 116, 113, 43;
contentPane.add(btnBasicMetal);

JButton btnSemiMetal = new JButton "Semi Metal";
btnSemiMetal.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        JOptionPane.showMessageDialog null, new
SemiMetals().properties());
    }
};

btnSemiMetal.setBackground new Color 0, 204, 0);
btnSemiMetal.setForeground Color.WHITE;
btnSemiMetal.setFont new Font "Tahoma", Font.BOLD, 12);
btnSemiMetal.setBounds(725, 116, 113, 43);
contentPane.add(btnSemiMetal);

JButton btnNonMetal = new JButton "Non Metal";
btnNonMetal.addActionListener new ActionListener() {
    public void actionPerformed ActionEvent e) {
        JOptionPane.showMessageDialog null, new
NonMetals().properties());
    }
};

btnNonMetal.setBackground new Color 0, 102, 204);
btnNonMetal.setForeground Color.WHITE;

```

```
btnNonMetal.setFont new Font "Tahoma", Font BOLD, 12);
btnNonMetal.setBounds 205, 170, 113, 43;
contentPane.add(btnNonMetal);

JButton btnHalogen = new JButton "Halogen";
btnHalogen.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        JOptionPane.showMessageDialog null, new
Halogen().properties());
    }
};

btnHalogen.setBackground new Color 255, 153, 51);
btnHalogen.setForeground Color WHITE;
btnHalogen.setFont new Font "Tahoma", Font BOLD, 12);
btnHalogen.setBounds 331, 170, 113, 43);
contentPane.add(btnHalogen);

JButton btnNobleGas = new JButton "Noble Gas";
btnNobleGas.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        JOptionPane.showMessageDialog null, new
NobleGas().properties());
    }
};

btnNobleGas.setBackground Color YELLOW;
btnNobleGas.setForeground Color WHITE;
btnNobleGas.setFont new Font "Tahoma", Font BOLD, 12);
btnNobleGas.setBounds 460, 170, 113, 43);
contentPane.add(btnNobleGas);

JButton btnLanthanide = new JButton "Lanthanide";
btnLanthanide.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        JOptionPane.showMessageDialog null, new
Lanthanide().properties());
    }
};

btnLanthanide.setBackground Color GREEN;
btnLanthanide.setForeground Color WHITE;
btnLanthanide.setFont new Font "Tahoma", Font BOLD, 12);
btnLanthanide.setBounds 592, 170, 113, 43);
contentPane.add(btnLanthanide);

JButton btnActinide = new JButton "Actinide";
btnActinide.addActionListener new ActionListener(){
    public void actionPerformed ActionEvent e){
        JOptionPane.showMessageDialog null, new
Actinide().properties());
    }
};
```

```

        );
        btnActinide.setBackground Color RED;
        btnActinide.setForeground Color WHITE;
        btnActinide.setFont new Font "Tahoma", Font.BOLD, 12);
        btnActinide.setBounds 725, 170, 113, 43);
        contentPane.add(btnActinide);
    }
}

```

✓ Text Class---Text.java

```

package Elements;

import java.awt.BorderLayout;
import java.awt.Component;
import java.awt.EventQueue;
import java.io.*;
import javax.swing.JFrame;
import javax.swing.JOptionPane;
import javax.swing.JPanel;
import javax.swing.JScrollPane;
import javax.swing.border.EmptyBorder;
import javax.swing.text.JTextComponent;
import javax.swing.JTextArea;
import javax.swing.JButton;
import java.awt.Font;
import java.awt.TextArea;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;

public class Text extends JFrame {

    private String info;
    private JPanel contentPane;
    /**
     * Launch the application.
     */
    public static void main String[] args {
        EventQueue.invokeLater new Runnable() {
            public void run() {
                try {
                    Text frame = new Text();
                    frame.setVisible true;
                } catch (Exception e) {
                    e.printStackTrace();
                }
            }
        }
    }
    /**
     * Create the frame.
     */

```

```

public Text0 {
    setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
    setBounds(100, 100, 650, 477);
    contentPane = new JPanel();
    contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
    setContentPane(contentPane);
    contentPane.setLayout(null);

    //Print button
    JButton btnPrint = new JButton("PRINT");
    btnPrint.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            try {
                File file = new File
                    ("C:\\\\Users\\\\USER\\\\Desktop\\\\Information.txt");
                if(!file.exists()) {
                    file.createNewFile();
                }
                PrintWriter output = new PrintWriter(file);
                output.print(info);
                JOptionPane.showMessageDialog(null, "Printed. Please
check the file named 'Information.txt' in desktop window");
            } catch (Exception ex) {
                JOptionPane.showMessageDialog(null, "file can not be
created");
            }
        }
    });
    btnPrint.setBounds(10, 407, 89, 23);
    contentPane.add(btnPrint);

    //Back button
    JButton btnBack = new JButton("BACK");
    btnBack.addActionListener(new ActionListener() {
        public void actionPerformed(ActionEvent arg0) {
            dispose();
        }
    });
    btnBack.setBounds(535, 407, 89, 23);
    contentPane.add(btnBack);

    JScrollPane scrollPane = new JScrollPane();
    scrollPane.setBounds(0, 0, 634, 396);
    contentPane.add(scrollPane);

    JTextArea textArea = new JTextArea();
    scrollPane.setViewportView(textArea);
    textArea.setFont(new Font("Georgia", Font.PLAIN, 16));
    textArea.setLineWrap(true);
    textArea.setWrapStyleWord(true);
}

```

```

        textArea.setEditable(true);

    }

    public Text String info) {
        setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
        setBounds(100, 100, 650, 477);
        contentPane = new JPanel();
        contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
        setContentPane(contentPane);
        contentPane.setLayout(null);

        JButton btnPrint = new JButton("PRINT");
        btnPrint.setBounds(10, 407, 89, 23);
        contentPane.add(btnPrint);
        btnPrint.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent e) {
                try {
                    File file = new File ("Information.txt");
                    if(file.exists()) {
                        file.createNewFile();
                    }
                    //Splitting string in lines using
                    String [] lines = info.split(",");
                    PrintWriter output = new PrintWriter(file);
                    for int i = 0 ; i < lines.length; i++) {
                        output.println(lines[i]);
                    }
                    JOptionPane.showMessageDialog(null, "Printed. Please
check the file named 'Information.txt' in sorce folder.");
                    output.close();
                }
                catch Exception ex {
                    JOptionPane.showMessageDialog(null, "file can not be
created");
                }
            }
        });
        JButton btnBack = new JButton("BACK");
        btnBack.setBounds(535, 407, 89, 23);
        contentPane.add(btnBack);
        btnBack.addActionListener(new ActionListener() {
            @Override
            public void actionPerformed(ActionEvent e) {
                dispose();
            }
        });

        JScrollPane scrollPane = new JScrollPane();
        scrollPane.setBounds(0, 0, 634, 396);

```

```

contentPane.add(scrollPane);

JTextArea textArea = new JTextArea();
scrollPane.setViewportView(textArea);
textArea.setFont(new Font("Georgia", Font.PLAIN, 16));
textArea.setLineWrap(true);
textArea.setWrapStyleWord(true);
textArea.setEditable(false);
textArea.setText(info);

```

✓ Quiz Class---Quiz.java

```

package Elements;

import java.io.File;
import java.io.IOException;
import java.util.*;
import javax.swing.JOptionPane;

public class Quiz {

    private static int marks = 0;
    public ArrayList<String> question = new ArrayList<>();
    public ArrayList<String> answer = new ArrayList<>();

    public Quiz() throws Exception {
        try {
            File file = new File("Question.txt");

            if (!file.exists())
                throw new Exception ("Error! File not found");
            Scanner input = new Scanner(file);

            // taking input from file [ Questions ]
            while (input.hasNext()) {
                question.add(input.nextLine());
            }

            // Opening the file containing answers
            File ansfile = new File ("Answers.txt");

            if (!ansfile.exists())
                throw new Exception ("Error! File not found");

            Scanner inputAnsfile = new Scanner(ansfile);

            // taking input from file [ Answers ]
            while (inputAnsfile.hasNext()) {
                answer.add(inputAnsfile.nextLine());
            }
        }
    }
}

```

```

        }

        // calling QuizTest Frame
        try {
            QuizTest quizTest = new QuizTest(question, answer);
            quizTest.setVisible(true);
        }
        catch (Exception ex) {
            JOptionPane.showMessageDialog(null, "Error");
        }
        catch (IOException e) {
            JOptionPane.showMessageDialog(null, "File missing.");
        }
    }

    public static int getMarks() {
        return marks;
    }

    public static void updateMarks() {
        marks++;
    }

    public static void setMarkstoZero() {
        marks = 0;
    }
}

```

✓ QuizTest Class---QuizTest.java

```

package Elements;

import java.awt.BorderLayout;
import java.awt.EventQueue;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import javax.swing.JScrollPane;
import javax.swing.JButton;
import java.awt.Font;
import java.awt.event.ActionListener;
import java.util.ArrayList;
import java.awt.event.ActionEvent;
import javax.swing.JSeparator;
import javax.swing.SwingConstants;
import java.awt.Color;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import javax.swing.JTextField;

public class QuizTest extends JFrame {

```

```
private JPanel contentPane;
private JTextField textField;
private JTextField textField_2;
private JTextField textField_3;
private JTextField textField_4;
private JTextField textField_5;
private JTextField textField_6;
private JTextField textField_7;
private JTextField textField_8;
private JTextField textField_9;
private JTextField textField_10;
private JTextField textField_11;
private JTextField textField_12;
private JTextField textField_13;
private JTextField textField_14;
private JTextField textField_15;
private JTextField textField_16;
private JTextField textField_17;
private JTextField textField_18;
private JTextField textField_19;
private JLabel label;
private JLabel label_1;
private JLabel label_2;
private JLabel label_3;
private JLabel label_4;
private JLabel label_5;
private JLabel label_6;
private JLabel label_7;
private JLabel label_8;
private JLabel label_9;

/**
 * Launch the application.
 */
public static void main String[] args {
    EventQueue.invokeLater new Runnable() {
        public void run() {
            try {
                QuizTest frame = new QuizTest();
                frame.setVisible(true);
            } catch (Exception e) {
                e.printStackTrace();
            }
        }
    }
}

/**
 * Create the frame.
 */
public QuizTest ArrayList<String> question, ArrayList<String> answer ) {
```

```

setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
setBounds(100, 100, 890, 546);
contentPane = new JPanel();
contentPane.setBackground(Color.CYAN);
contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
setContentPane(contentPane);
contentPane.setLayout(null);

JButton btnSubmitAnswer = new JButton("SUBMIT ANSWER");
btnSubmitAnswer.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        JOptionPane.showMessageDialog(null, "Correct : "
+Quiz.getMarks()+"\nPonts out of 10 : "+Quiz.getMarks()+"\nAnswers : "
+answer.toString());
    }
});
btnSubmitAnswer.setForeground(Color.BLACK);
btnSubmitAnswer.setBounds(10, 473, 174, 23);
btnSubmitAnswer.setFont(new Font("Tahoma", Font.PLAIN, 13));
contentPane.add(btnSubmitAnswer);

JButton btnExitTest = new JButton("EXIT TEST");
btnExitTest.setForeground(Color.BLACK);
btnExitTest.setBounds(748, 473, 116, 23);
btnExitTest.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent arg0) {
        Quiz.setMarkstoZero();
        dispose();
    }
});
btnExitTest.setFont(new Font("Tahoma", Font.PLAIN, 13));
contentPane.add(btnExitTest);

textField = new JTextField();
textField.setText(question.get(0));
textField.setBounds(20, 64, 410, 30);
contentPane.add(textField);
textField.setColumns(10);
textField.setEditable(false);

textField_2 = new JTextField();
textField_2.addActionListener(new ActionListener() {
    int count = 0;
    public void actionPerformed(ActionEvent e) {
        String ans = "xXx";
        if(count == 0) {
            ans = textField_2.getText();
            count++;
        }
    }
});

```

```
        }
        if (ans.equalsIgnoreCase(answer.get(0))) {
            Quiz.updateMarks();
            textField_2.setEditable(false);
        }
    }
};

textField_2.setColumns(10);
textField_2.setBounds(20, 105, 410, 30);
contentPane.add(textField_2);

textField_3 = new JTextField();
textField_3.addActionListener(new ActionListener() {
    int count = 0;
    public void actionPerformed(ActionEvent e) {
        String ans = "xXx";
        if (count == 0) {
            ans = textField_3.getText();
            count++;
        }
        if (ans.equalsIgnoreCase(answer.get(1))) {
            Quiz.updateMarks();
            textField_3.setEditable(false);
        }
    }
});
textField_3.setColumns(10);
textField_3.setBounds(20, 187, 410, 30);
contentPane.add(textField_3);

textField_4 = new JTextField();
textField_4.setEditable(false);
textField_4.setText(question.get(1));

textField_4.setColumns(10);
textField_4.setBounds(20, 146, 410, 30);
contentPane.add(textField_4);

textField_5 = new JTextField();
textField_5.addActionListener(new ActionListener() {
    int count = 0;
    public void actionPerformed(ActionEvent e) {
        String ans = "xXx";
        if (count == 0) {
            ans = textField_5.getText();
            count++;
        }
        if (ans.equalsIgnoreCase(answer.get(2))) {
```

```

        Quiz.updateMarks();
        textField_5.setEditable(false);
    }

}

};

textField_5.setColumns(10);
textField_5.setBounds(20, 269, 410, 30);
contentPane.add(textField_5);

textField_6 = new JTextField();
textField_6.setColumns(10);
textField_6.setBounds(20, 228, 410, 30);
contentPane.add(textField_6);
textField_6.setEditable(false);
textField_6.setText(question.get(2));

textField_7 = new JTextField();
textField_7.addActionListener(new ActionListener() {
    int count = 0;
    public void actionPerformed(ActionEvent e) {
        String ans = "xXx";
        if(count == 0) {
            ans = textField_7.getText();
            count++;
        }
        if(ans.equalsIgnoreCase(answer.get(3))) {

            Quiz.updateMarks();
            textField_7.setEditable(false);
        }
    }
});

textField_7.setColumns(10);
textField_7.setBounds(20, 351, 410, 30);
contentPane.add(textField_7);

textField_8 = new JTextField();
textField_8.setColumns(10);
textField_8.setBounds(20, 310, 410, 30);
contentPane.add(textField_8);
textField_8.setEditable(false);
textField_8.setText(question.get(3));

textField_9 = new JTextField();
textField_9.addActionListener(new ActionListener() {
    int count = 0;
    public void actionPerformed(ActionEvent e) {
        String ans = "xXx";
        if(count == 0) {

```

```

        ans = textField_9.getText();
        count++;
    }
    if (ans.equalsIgnoreCase(answer.get(4))) {
        Quiz.updateMarks();
        textField_9.setEditable(false);
    }
}
textField_9.setColumns(10);
textField_9.setBounds(20, 432, 410, 30);
contentPane.add(textField_9);

textField_10 = new JTextField();
textField_10.setColumns(10);
textField_10.setBounds(20, 392, 410, 30);
contentPane.add(textField_10);
textField_10.setEditable(false);
textField_10.setText(question.get(4));

textField_1 = new JTextField();
textField_1.setColumns(10);
textField_1.setBounds(454, 64, 410, 30);
contentPane.add(textField_1);
textField_1.setEditable(false);
textField_1.setText(question.get(5));

textField_11 = new JTextField();
textField_11.addActionListener(new ActionListener() {
    int count = 0;
    public void actionPerformed(ActionEvent e) {
        String ans = "xXx";
        if (count == 0) {
            ans = textField_11.getText();
            count++;
        }
        if (ans.equalsIgnoreCase(answer.get(5))) {
            Quiz.updateMarks();
            textField_11.setEditable(false);
        }
    }
});
textField_11.setColumns(10);
textField_11.setBounds(454, 105, 410, 30);
contentPane.add(textField_11);

textField_12 = new JTextField();
textField_12.setColumns(10);

```

```
        textField_12.setBounds(454, 146, 410, 30);
        contentPane.add(textField_12);
        textField_12.setEditable(false);
        textField_12.setText(question.get(6));

        textField_13 = new JTextField();
        textField_13.addActionListener(new ActionListener() {
            int count = 0;
            public void actionPerformed(ActionEvent e) {
                String ans = "xXx";
                if(count == 0) {
                    ans = textField_13.getText();
                    count++;
                }
                if(ans.equalsIgnoreCase(answer.get(6))) {
                    Quiz.updateMarks();
                    textField_13.setEditable(false);
                }
            }
        });
        textField_13.setColumns(10);
        textField_13.setBounds(454, 187, 410, 30);
        contentPane.add(textField_13);

        textField_14 = new JTextField();
        textField_14.setColumns(10);
        textField_14.setBounds(454, 228, 410, 30);
        contentPane.add(textField_14);
        textField_14.setEditable(false);
        textField_14.setText(question.get(7));

        textField_15 = new JTextField();
        textField_15.addActionListener(new ActionListener() {
            int count = 0;
            public void actionPerformed(ActionEvent e) {
                String ans = "xXx";
                if(count == 0) {
                    ans = textField_15.getText();
                    count++;
                }
                if(ans.equalsIgnoreCase(answer.get(7))) {
                    Quiz.updateMarks();
                    textField_15.setEditable(false);
                }
            }
        });
        textField_15.setColumns(10);
        textField_15.setBounds(454, 269, 410, 30);
        contentPane.add(textField_15);
```

```

        textField_16 = new JTextField();
        textField_16.setColumns(10);
        textField_16.setBounds(454, 310, 410, 30);
        contentPane.add(textField_16);
        textField_16.setEditable(false);
        textField_16.setText(question.get(8));

        textField_17 = new JTextField();
        textField_17.addActionListener(new ActionListener() {
            int count = 0;
            public void actionPerformed(ActionEvent e) {
                String ans = "xXx";
                if(count == 0) {
                    ans = textField_17.getText();
                    count++;
                }
                if(ans.equalsIgnoreCase(answer.get(8))) {

                    Quiz.updateMarks();
                    textField_17.setEditable(false);
                }
            }
        });
        textField_17.setColumns(10);
        textField_17.setBounds(454, 351, 410, 30);
        contentPane.add(textField_17);

        textField_18 = new JTextField();
        textField_18.setColumns(10);
        textField_18.setBounds(454, 392, 410, 30);
        contentPane.add(textField_18);
        textField_18.setEditable(false);
        textField_18.setText(question.get(9));

        textField_19 = new JTextField();
        textField_19.addActionListener(new ActionListener() {
            int count = 0;
            public void actionPerformed(ActionEvent e) {
                String ans = "xXx";
                if(count == 0) {
                    ans = textField_19.getText();
                    count++;
                }
                if(ans.equalsIgnoreCase(answer.get(9))) {
                    Quiz.updateMarks();
                    textField_19.setEditable(false);
                }
            }
        });
    }
}

```

```
});  
textField_19.setColumns(10);  
textField_19.setBounds(454, 433, 410, 30);  
contentPane.add(textField_19);  
  
JLabel lblQuickTest = new JLabel("Quick Test");  
lblQuickTest.setForeground(Color.BLACK);  
lblQuickTest.setFont(new Font("Georgia", Font.BOLD, 16));  
lblQuickTest.setBounds(10, 11, 123, 42);  
contentPane.add(lblQuickTest);  
  
JLabel lblPleaseAnswerThsese = new JLabel("Please answer thsese  
questions and press submit answer to get points");  
lblPleaseAnswerThsese.setForeground(Color.BLACK);  
lblPleaseAnswerThsese.setFont(new Font("Tahoma", Font.BOLD, 12));  
lblPleaseAnswerThsese.setBounds(178, 26, 613, 14);  
contentPane.add(lblPleaseAnswerThsese);  
  
label = new JLabel("1");  
label.setFont(new Font("Tahoma", Font.BOLD, 15));  
label.setForeground(Color.BLACK);  
label.setBounds(0, 67, 24, 23);  
contentPane.add(label);  
  
label_1 = new JLabel("2");  
label_1.setForeground(Color.BLACK);  
label_1.setFont(new Font("Tahoma", Font.BOLD, 15));  
label_1.setBounds(0, 146, 24, 30);  
contentPane.add(label_1);  
  
label_2 = new JLabel("3");  
label_2.setForeground(Color.BLACK);  
label_2.setFont(new Font("Tahoma", Font.BOLD, 15));  
label_2.setBounds(0, 228, 24, 30);  
contentPane.add(label_2);  
  
label_3 = new JLabel("4");  
label_3.setForeground(Color.BLACK);  
label_3.setFont(new Font("Tahoma", Font.BOLD, 15));  
label_3.setBounds(0, 310, 24, 30);  
contentPane.add(label_3);  
  
label_4 = new JLabel("5");  
label_4.setForeground(Color.BLACK);  
label_4.setFont(new Font("Tahoma", Font.BOLD, 15));  
label_4.setBounds(0, 391, 24, 30);  
contentPane.add(label_4);  
  
label_5 = new JLabel("6");
```

```

        label_5.setForeground Color.BLACK;
        label_5.setFont new Font "Tahoma", Font.BOLD, 15);
        label_5.setBounds 429, 62, 24, 30);
        contentPane.add(label_5);

        label_6 = new JLabel " 7";
        label_6.setForeground Color.BLACK;
        label_6.setFont new Font "Tahoma", Font.BOLD, 15);
        label_6.setBounds 429, 146, 24, 30);
        contentPane.add(label_6);

        label_7 = new JLabel " 8";
        label_7.setForeground Color.BLACK;
        label_7.setFont new Font "Tahoma", Font.BOLD, 15);
        label_7.setBounds 429, 228, 24, 30);
        contentPane.add(label_7);

        label_8 = new JLabel " 9";
        label_8.setForeground Color.BLACK;
        label_8.setFont new Font "Tahoma", Font.BOLD, 15);
        label_8.setBounds 429, 310, 24, 30);
        contentPane.add(label_8);

        label_9 = new JLabel " 10";
        label_9.setForeground Color.BLACK;
        label_9.setFont new Font "Tahoma", Font.BOLD, 15);
        label_9.setBounds 429, 391, 24, 30);
        contentPane.add(label_9);
    }

    public QuizTest() {
        this null, null);
    }
}

}

```

✓ | Online Class---Online.java

```

package Elements;

import java.awt.BorderLayout;

import java.awt.EventQueue;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import javax.swing.JButton;
import java.awt.event.ActionListener;
import java.awt.event.ActionEvent;
import javax.swing.JLabel;

```

```
import javax.swing.JOptionPane;
import java.awt.Font;
import java.awt.Color;
import java.awt.Desktop;
import java.awt.event.MouseAdapter;
import java.awt.event.MouseEvent;
import java.net.URI;

public class Online extends JFrame {

    private JPanel contentPane;

    /**
     * Launch the application.
     */
    public static void main String[] args {
        EventQueue.invokeLater new Runnable() {
            public void run() {
                try {
                    Online frame = new Online();
                    frame.setTitle "Online Sites";
                    frame.setVisible true();
                } catch (Exception e) {
                    e.printStackTrace();
                }
            }
        }
    }

    /**
     * Create the frame.
     */
    public Online() {
        setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
        setBounds 100, 100, 700, 500;
        contentPane = new JPanel();
        contentPane.setBackground Color.CYAN;
        contentPane.setBorder new EmptyBorder(5, 5, 5, 5);
        setContentPane contentPane);
        contentPane.setLayout(null);

        JButton btnBack = new JButton "BACK";
        btnBack.addActionListener new ActionListener() {
            public void actionPerformed ActionEvent e) {
                dispose();
            }
        );
        btnBack.setBounds 585, 427, 89, 23);
        contentPane.add(btnBack);

        JLabel lblSomeWebsitesWith = new JLabel "Some websites with interactive
periodic table";
    }
}
```

```

lblSomeWebsitesWith.setFont(new Font("Georgia", Font.BOLD, 14));
lblSomeWebsitesWith.setToolTipText("");
lblSomeWebsitesWith.setBounds(10, 11, 540, 14);
contentPane.add(lblSomeWebsitesWith);

JLabel lblDynamicPeriodicTable = new JLabel("Dynamic Periodic Table");
lblDynamicPeriodicTable.addMouseListener(new MouseAdapter() {
    @Override
    public void mouseClicked(MouseEvent arg0) {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new URI("https://www.ptable.com/");
            browser.browse(uri);
        }
        catch (Exception ex) {
            JOptionPane.showMessageDialog(null, "Sorry can not
open browser.");
        }
    }
});
lblDynamicPeriodicTable.setForeground(Color.BLUE);
lblDynamicPeriodicTable.setFont(new Font("Tahoma", Font.BOLD, 13));
lblDynamicPeriodicTable.setBounds(10, 36, 198, 23);
contentPane.add(lblDynamicPeriodicTable);

JLabel lblChemicool = new JLabel("Chemicool");
lblChemicool.addMouseListener(new MouseAdapter() {
    @Override
    public void mouseClicked(MouseEvent e) {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new URI("https://www.chemicool.com/");
            browser.browse(uri);
        }
        catch (Exception ex) {
            JOptionPane.showMessageDialog(null, "Sorry can not
open browser.");
        }
    }
});
lblChemicool.setForeground(Color.BLUE);
lblChemicool.setFont(new Font("Tahoma", Font.BOLD, 13));
lblChemicool.setBounds(10, 66, 198, 23);
contentPane.add(lblChemicool);

JLabel lblWebElements = new JLabel("Web Elements");
lblWebElements.addMouseListener(new MouseAdapter() {

```

```

@Override
public void mouseClicked MouseEvent e {
    Desktop browser = Desktop.getDesktop();
    URI uri;

    try {
        uri = new URI("https://www.webelements.com/");
        browser.browse(uri);
    }
    catch Exception ex {
        JOptionPane.showMessageDialog(null, "Sorry can not
open browser.");
    }
}

lblWebElements.setForeground Color.BLUE;
lblWebElements.setFont new Font("Tahoma", Font.BOLD, 13));
lblWebElements.setBounds(10, 95, 198, 23);
contentPane.add(lblWebElements);

JLabel lblPeriodicTableFor = new JLabel("Periodic Table for kids");
lblPeriodicTableFor.setToolTipText("");
lblPeriodicTableFor.setFont new Font("Georgia", Font.BOLD, 14));
lblPeriodicTableFor.setBounds(10, 124, 540, 14);
contentPane.add(lblPeriodicTableFor);

JLabel lblDucksters = new JLabel("Ducksters");
lblDucksters.addMouseListener new MouseAdapter() {
    @Override
    public void mouseClicked MouseEvent e {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new
URI("https://www.ducksters.com/science/periodic_table.php");
            browser.browse(uri);
        }
        catch Exception ex {
            JOptionPane.showMessageDialog(null, "Sorry can not
open browser.");
        }
    }
};

lblDucksters.setForeground Color.BLUE;
lblDucksters.setFont new Font("Tahoma", Font.BOLD, 13));
lblDucksters.setBounds(10, 144, 198, 23);
contentPane.add(lblDucksters);

```

```

JLabel lblPeriodicTableOn = new JLabel "Periodic Table";
lblPeriodicTableOn.setToolTipText "";
lblPeriodicTableOn.setFont new Font "Georgia", Font.BOLD, 14);
lblPeriodicTableOn.setBounds 10, 178, 111, 14);
contentPane.add(lblPeriodicTableOn);

JLabel lblWikipedia = new JLabel "Wikipedia";
lblWikipedia.addMouseListener new MouseAdapter() {
    @Override
    public void mouseClicked MouseEvent e {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new
URI("https://en.wikipedia.org/wiki/Periodic_table");
            browser.browse(uri);
        }
        catch Exception ex) {
            JOptionPane.showMessageDialog null, "Sorry can not
open browser.");
        }
    }
};

lblWikipedia.setForeground Color.BLUE;
lblWikipedia.setFont new Font "Tahoma", Font.BOLD, 13);
lblWikipedia.setBounds 129, 174, 198, 23);
contentPane.add(lblWikipedia);

JLabel lblPeriodicTableTest = new JLabel "Periodic Table Test and Quiz";
lblPeriodicTableTest.setToolTipText "";
lblPeriodicTableTest.setFont new Font "Georgia", Font.BOLD, 14));
lblPeriodicTableTest.setBounds 10, 219, 224, 14);
contentPane.add(lblPeriodicTableTest);

JLabel lblThatquizorg = new JLabel "ThatQuiz.org";
lblThatquizorg.addMouseListener new MouseAdapter() {
    @Override
    public void mouseClicked MouseEvent e {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new URI "https://www.thatquiz.org/tq-
m/science/periodic-table/";
            browser.browse(uri);
        }
        catch Exception ex) {

```

```

        JOptionPane.showMessageDialog(null, "Sorry can not
open browser.");
    }
}
};

lblThatquizorg.setForeground Color.BLUE;
lblThatquizorg.setFont new Font "Tahoma", Font.BOLD, 13);
lblThatquizorg.setBounds(10, 244, 198, 23);
contentPane.add(lblThatquizorg);

JLabel lblMultipleChoice = new JLabel "100+ Multiple choice questions";
lblMultipleChoice.addMouseListener new MouseAdapter() {
    @Override
    public void mouseClicked MouseEvent e {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new URI "https://www.proprofs.com/quiz-
school/topic/periodic-table";
            browser.browse uri;
        }
        catch Exception ex {
            JOptionPane.showMessageDialog(null, "Sorry can not
open browser.");
        }
    }
};

lblMultipleChoice.setForeground Color.BLUE;
lblMultipleChoice.setFont new Font "Tahoma", Font.BOLD, 13);
lblMultipleChoice.setBounds(10, 278, 224, 23);
contentPane.add(lblMultipleChoice);

JLabel lblTheIUPACPeriodic = new JLabel "The IUPAC Periodic Table";
lblTheIUPACPeriodic.setToolTipText "";
lblTheIUPACPeriodic.setFont new Font "Georgia", Font.BOLD, 14);
lblTheIUPACPeriodic.setBounds(10, 320, 224, 14);
contentPane.add(lblTheIUPACPeriodic);

JLabel lblIUPACPeriodicTable = new JLabel "IUPAC periodic table";
lblIUPACPeriodicTable.addMouseListener new MouseAdapter() {
    @Override
    public void mouseClicked MouseEvent e {
        Desktop browser = Desktop.getDesktop();
        URI uri;

        try {
            uri = new URI "https://iupac.org/what-we-
do/periodic-table-of-elements/";
        }
    }
};

```

```

        browser.browse uri);
    }
    catch Exception ex) {
        JOptionPane.showMessageDialog null, "Sorry can not
open browser.");
    }
}
);
lblLupacPeriodicTable.setForeground Color.BLUE;
lblLupacPeriodicTable.setFont new Font("Tahoma", Font.BOLD, 13);
lblLupacPeriodicTable.setBounds(10, 345, 224, 23);
contentPane.add(lblLupacPeriodicTable);

```

✓ | Comment Class---Comment.java

```

package Elements;

import java.awt.BorderLayout;
import java.awt.EventQueue;
import javax.swing.JFrame;
import javax.swing.JPanel;
import javax.swing.border.EmptyBorder;
import javax.swing.JScrollPane;
import javax.swing.JTextArea;
import javax.swing.JLabel;
import javax.swing.JOptionPane;
import java.awt.Font;
import java.awt.Color;
import javax.swing.JTextField;
import javax.swing.JButton;
import java.awt.event.ActionListener;
import java.io.BufferedReader;
import java.io.File;
import java.io.FileWriter;
import java.io.IOException;
import java.io.PrintWriter;
import java.awt.event.ActionEvent;

public class Comment extends JFrame {

    private JPanel contentPane;
    private JTextField textField;

    /**
     * Launch the application.
     */
    public static void main String[] args {

```

```

EventQueue.invokeLater new Runnable() {
    public void run() {
        try {
            Comment frame = new Comment();
            frame.setVisible(true);
        } catch (Exception e) {
            e.printStackTrace();
        }
    }
}

/**
 * Create the frame.
 */
public Comment() {
    setDefaultCloseOperation(JFrame.DISPOSE_ON_CLOSE);
    setBounds(100, 100, 450, 300);
    contentPane = new JPanel();
    contentPane.setBackground(Color.CYAN);
    contentPane.setBorder(new EmptyBorder(5, 5, 5, 5));
    setContentPane(contentPane);
    contentPane.setLayout(null);

    JScrollPane scrollPane = new JScrollPane();
    scrollPane.setBounds(10, 36, 414, 119);
    contentPane.add(scrollPane);

    JTextArea textArea = new JTextArea();
    scrollPane.setViewportView(textArea);
    textArea.setLineWrap(true);
    textArea.setWrapStyleWord(true);
    textArea.setEditable(true);

    JLabel lblAddYourCommet = new JLabel("Add your commet here :");
    lblAddYourCommet.setFont(new Font("Georgia", Font.BOLD, 12));
    lblAddYourCommet.setBounds(10, 11, 185, 25);
    contentPane.add(lblAddYourCommet);

    JLabel lblEnterYourName = new JLabel("Enter your name :");
    lblEnterYourName.setFont(new Font("Georgia", Font.BOLD, 12));
    lblEnterYourName.setBounds(10, 154, 133, 34);
    contentPane.add(lblEnterYourName);

    textField = new JTextField();
    textField.setBounds(10, 183, 414, 33);
    contentPane.add(textField);
    textField.setColumns(10);

    JButton btnSubmit = new JButton("SUBMIT");
    btnSubmit.addActionListener(new ActionListener() {

```

```

public void actionPerformed(ActionEvent e) {
    try {
        File file = new File "comments.txt";
        if !file.exists() {
            file.createNewFile();
        }

        FileWriter fw = new FileWriter new
        File("comments.txt",true);
        BufferedWriter bw = new BufferedWriter(fw);
        PrintWriter pw = new PrintWriter(bw);

        pw.println "Comment : "+textArea.getText());
        pw.println "Commented by : "+textField.getText());
        pw.println "Commented on : "+new java.util.Date());
        pw.println "";
        //fw.close();
        //bw.close();
        pw.close();
        dispose();
    } catch (IOException e1) {
        JOptionPane.showMessageDialog null,"File not
        found", null JOptionPane.ERROR_MESSAGE;
    }
}

};

btnSubmit.setBounds(10, 227, 89, 23);
contentPane.add(btnSubmit);

JButton btnDispose = new JButton "EXIT";
btnDispose.addActionListener new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        dispose();
    }
};

btnDispose.setBounds(335, 230, 89, 23);
contentPane.add(btnDispose);
}
}

// END OF SOURCE CODE

```

- ✓ Files :
- ✓ PeriodicTable.txt

History of the periodic table of chemical elements ::

In 1809 :

At least 47 elements were discovered, and scientists began to see patterns in the characteristics.

In 1863 :

English chemist John [Newlands](#) divided the then discovered 56 elements into 11 groups, based on characteristics.

In 1869 :

Russian chemist [Dimitri Mendeleev](#) started the development of the periodic table, arranging chemical elements by atomic mass. He predicted the discovery of other elements, and left spaces open in his periodic table for them.

In 1894 :

Sir [William Ramsay](#) and Lord [Rayleigh](#) discovered the noble gases, which were added to the periodic table as group 0.

In 1897 :

English physicist J. J. [Thomson](#) first discovered electrons; small negatively charged particles in an atom.

In 1900 :

[Bequerel](#) discovered that electrons and beta particles as identified by the [Curies](#) are the same thing.

In 1903 :

[Rutherford](#) announced that [radioactivity](#) is caused by the breakdown of atoms.

In 1911 :

[Rutherford](#) and German physicist [Hans Geiger](#) discovered that electrons orbit the nucleus of an atom.

In 1913 :

[Bohr](#) discovered that electrons move around a nucleus in discrete energy called orbitals.

In 1914 :

[Rutherford](#) first identified protons in the atomic nucleus.

In 1932 :

James [Chadwick](#) first discovered [neutrons](#), and isotopes were identified. This was the complete basis for the periodic table.

In 1945 :

[Glenn Seaborg](#) identified [lanthanides](#) and [actinides](#) (atomic number >92), which are usually placed below the periodic table

✓ Info.txt :

INFORMATION

The periodic table consists of 118 elements, with 94 of these naturally occurring on the Earth and the rest being synthetic. Each element is contained in a small block. Information in the block includes the name of the element, its chemical symbol, atomic number and atomic mass.

Atomic Number and Mass

As the table progresses from left to right, and top to bottom, the atomic number of the elements increases. The atomic number is the count of the protons in the atomic nucleus.

The table also shows atomic mass, which is the total number of neutrons and protons in the atom's nucleus, averaged according to the relative abundance of the element's isotopes.

For elements with no stable isotope, the table gives in parenthesis the atomic mass of the isotope with the longest half-life; in other words, the most stable form of the element.

The Periods

The seven rows in the table represent periods. Each element in a single row has the same number of electron shells that surround the atomic nucleus. The elements hydrogen and helium have a single orbital shell; elements in the second row have two orbitals, and so on.

In the seventh period, elements have a seventh orbital shell.

The Groups

The table's 18 columns, read vertically from top to bottom, represent groups. All elements in a group have the same number of electrons orbiting the nucleus in the outermost shell.

The exceptions to this rule include hydrogen, helium and the "transitional elements," which occupy groups three through 12. Elements in a group share important chemical characteristics. Group 18, for example, includes the "inert" or "noble" gases. Group 17 includes the five halogens.

Lanthanides and Actinides

At the bottom of the periodic table are two additional rows of 14 elements each. The top row

shows the lanthanides, elements 58 through 71; these are also called rare earths. The bottom row is the actinides, which begin with element 90 and end at 103; note, however, that elements beyond 103 exist and will continue to be added to the periodic table as scientists discover new ones. The first elements in these two series are contained in the main body of the periodic table: lanthanum (57) and actinium (89).

The Element Groups

There are nine basic groups of elements shown in the periodic table. They are the alkali metals, alkaline earth metals, transition metals, other metals, metalloids, non-metals, halogens, noble gases and rare earth elements.

List of Representative Elements in S Block

The S Block elements or the elements in columns 1A and 2A on the left of the periodic table include Hydrogen (H), Lithium (Li), Sodium (Na), Potassium (K), Rubidium (Rb), Cesium (Cs), Francium (Fr), Beryllium (Be), Magnesium (Mg), Calcium (Ca), Strontium (Sr), Barium (Ba) and Radium (Ra).

List of Representative Elements in P Block

The P Block elements or the elements in columns 3A through 8A on the right of the periodic table include Boron (B), Aluminum (Al), Gallium (Ga), Indium (In), Thallium (Tl), Carbon (C), Silicon (Si), Germanium (Ge), Tin(Sn), Lead (Pb), Ununquadium (Uug), Nitrogen (N), Phosphorus (P), Arsenic (As), Antimony (Sb), Bismuth (Bi), Oxygen (O), Sulfur (S), Selenium (Se), Tellurium (Te), Polonium (Po), Fluoride (F), Chlorine (Cl), Bromine (Br), Iodine (I), Astatine (At), Helium (He), Neon (Ne), Argon (Ar), Krypton (Kr), Xenon (Xe) and Radon (Rn).

-----ALL THESE INFORMATIONS ARE FROM RELIABLE SOURCES-----

✓ Question.txt :

How many groups are in the modern periodic table? [In number]
How many periods are in the modern periodic table? [In number]
What is the full element name for 'Ar' ?

What is the symbol of element gold?

List all Noble Gas symbolic name separetd by one space :

Hydrogn is a _____ element ?

List all Halogen symbolic name separated by one space :

What is the atomic number for Tin [Sn] ?

Who is called the father of modern periodic table ?

What is the last element of periodic table ?

Answer.txt :

18

7

Argon

Au

He Ne Ar Kr Xe Rn Og

Nonmetal

F Cl Br I At Ts

50

Dmitri Mendeleev

Og

IMAGES OF STEP STEP DESCRIPTION OF THIS PROJECT

Sample of Code :

There are thousands of line of code here : 5600 + lines

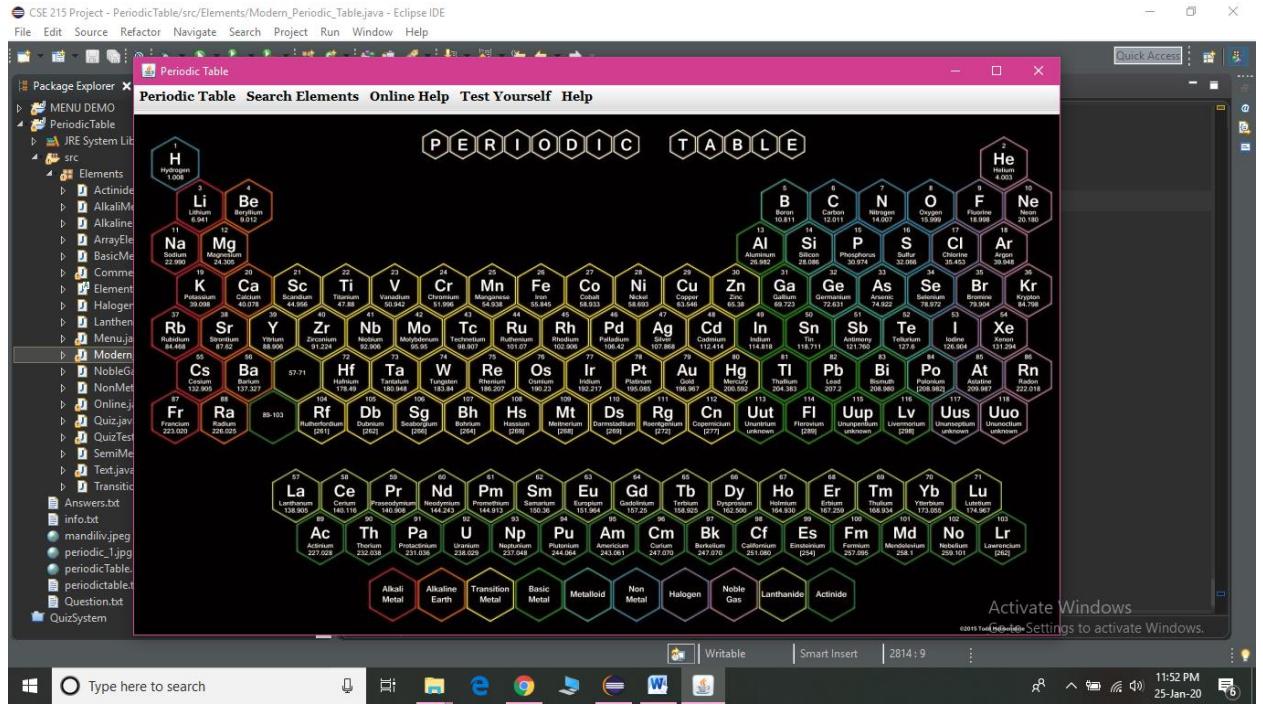
```
btmHalogen.setForeground(Color.WHITE);
btmHalogen.setFont(new Font("Tahoma", Font.BOLD, 12));
btmHalogen.setBounds(331, 170, 113, 43);
contentPane.add(btnHalogen);

JButton btnNobleGas = new JButton("Noble Gas");
btnNobleGas.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        JOptionPane.showMessageDialog(null, new NobleGas().properties());
    }
});
btnNobleGas.setBackground(Color.YELLOW);
btnNobleGas.setForeground(Color.WHITE);
btnNobleGas.setFont(new Font("Tahoma", Font.BOLD, 12));
btnNobleGas.setBounds(460, 170, 113, 43);
contentPane.add(btnNobleGas);

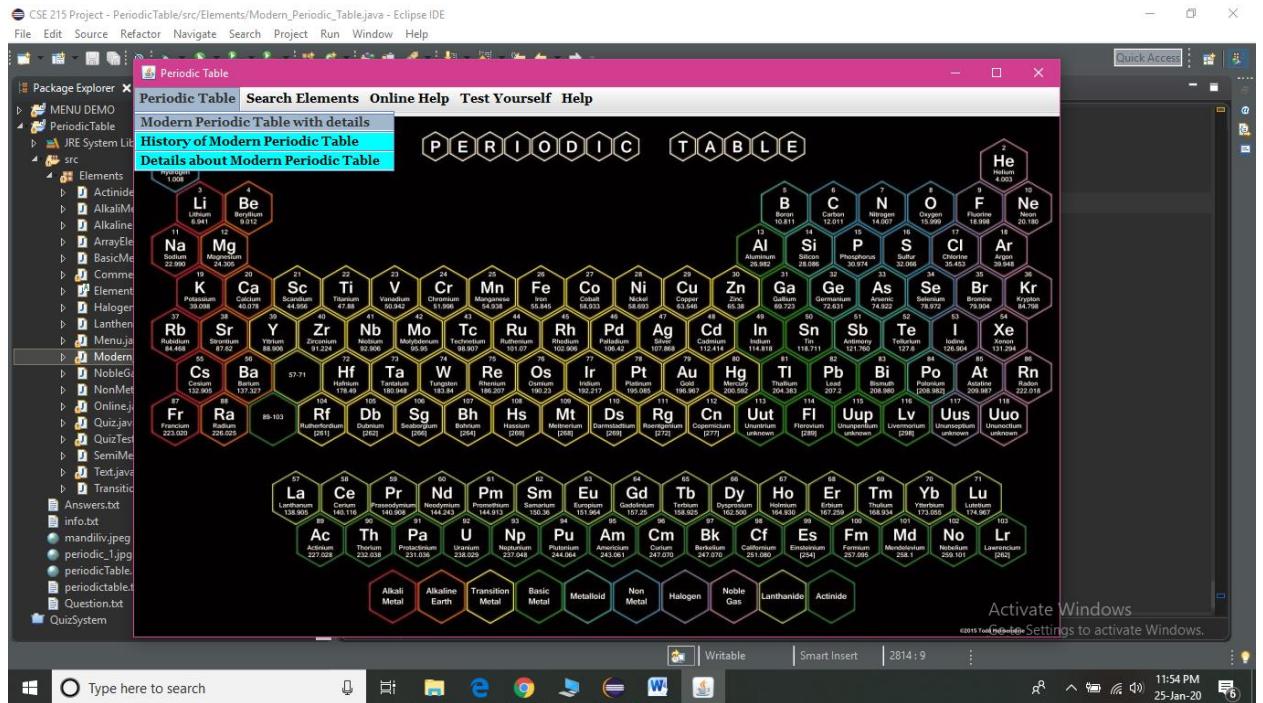
JButton btnLanthanide = new JButton("Lanthanide");
btnLanthanide.addActionListener(new ActionListener() {
    public void actionPerformed(ActionEvent e) {
        JOptionPane.showMessageDialog(null, new Lanthanide().properties());
    }
});
btnLanthanide.setBackground(Color.GREEN);
```

Main menu :

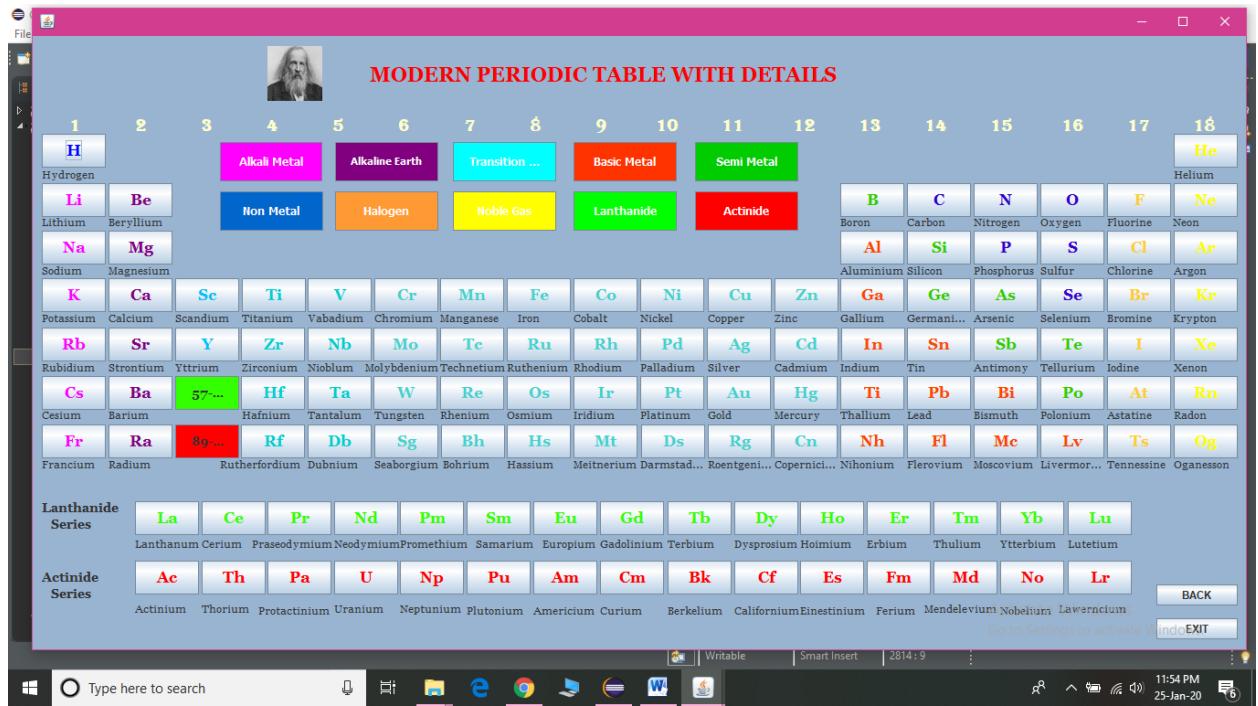
The main menu is interactive. There are some sub menu like “Periodic Table, Search Elements, Online help, Test Yourself , Help” option. We can access any option by clicking on it.



Selecting “Periodic Table” we get :



Here I've selected the first option "Modern Periodic Table with details" , which opens an interactive periodic table in a new window.



This window is totally interactive. The numbers above are group numbers.

Every elements are in the BOX shape. If we click any one of them. That shows the details about that element.

There is a back option to go back to main menu and an exit option to exit the program.

If we click the colored boxes :

MODERN PERIODIC TABLE WITH DETAILS

The screenshot shows the main interface of the application. At the top, there's a portrait of a man. Below the title, the periodic table is displayed with various categories color-coded: Alkali Metal (pink), Alkaline Earth (purple), Non Metal (blue), Halogen (orange), Noble Gas (yellow), Transition ... (cyan), Basic Metal (red), Lanthanide (green), Actinide (red), and Semi Metal (green). A tooltip for Hydrogen (H) is open, stating: "Properties : Found in column 1A of the periodic table. Have one electron in their outermost layer of electrons. Easily ionized. Silvery, soft, and not dense. Low melting points and incredibly reactive." An "OK" button is at the bottom of the tooltip.

By clicking the elements : Example O :

MODERN PERIODIC TABLE WITH DETAILS

A modal window is open for Oxygen (O). It contains the following details:

- Atomic Number ----- 8,
- Name ----- Oxygen,
- Symbol ----- O,
- Electron Configuration ----- [He] 2s 2 p4,
- Origin of Name ----- the Greek 'oxy' and 'genes' meaning acid-forming,
- Group ----- 16,
- Block ----- p,
- Atomic Weight ----- 15.999 Kelvin,
- Melting Point ----- 54.36 Kelvin,
- Boiling Point ----- 90.2 g/cm³.

Properties : Nonmetals have high ionization energies and electronegativities. Solid nonmetals are generally brittle, with little or no metallic luster. Most nonmetals have the ability to gain electrons easily.

Behaviour : Generally poor conductors of heat and electricity.

At the bottom of the modal, there are "PRINT" and "BACK" buttons.

If we click the print option. The information is printed on a text file and shows the location of the file in the window :

MODERN PERIODIC TABLE WITH DETAILS

Properties : Nonmetals have high ionization energy. Nonmetals are generally brittle, with little or no ability to gain electrons easily.

Behaviour : Generally poor conductors of heat and electricity.

PRINT BACK

1	H	Hydrogen	Atomic Number ----- 8, Name ----- Oxygen, Symbol ----- O, Electron Configuration ----- [He] 2s ₂ 2p ₄ , Origin of Name ----- the Greek 'oxy' and 'genes' meaning acid-forming, Group ----- 16, Block ----- p, Atomic Weight ----- 15.999 Kelvin, Melting Point ----- 54.36 Kelvin, Boiling Point ----- 90.2 g/cm ³ ,	11	12	13	14	15	16	17	18
				Semi Metal	B	C	N	O	F	He	
				Actinide	Boron	Carbon	Nitrogen	Oxygen	Fluorine	Neon	
					Al	Si	P	S	Cl	Ar	
					Aluminum	Silicon	Phosphorus	Sulfur	Chlorine	Argon	
					Ga	Ge	As	Se	Br	Kr	
					Gallium	Germanium	Arsenic	Selenium	Bromine	Krypton	
					In	Sn	Sb	Te	I	Xe	
					Indium	Tin	Antimony	Tellurium	Iodine	Xenon	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
					Roentgenium	Copernicium	Nihonium	Flerovium	Moscovium	Livermorium	
										Ts	
										Og	
										Oganesson	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
										Oganesson	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
					Tb	Dy	Ho	Er	Tm	Yb	
					Dysprosium	Hoium	Erbium	Thulium	Ytterbium	Lutetium	
					Cu	Zn	Ga	Ge	Tb	Lu	
					Copper	Zinc	Gallium	Germanium	Terbium	Lutetium	
					Ag	Cd	In	Sn	Yb	Lu	
					Silver	Cadmium	Indium	Tin	Antimony	Terbium	
					Au	Hg	Tl	Pb	Bi	Po	
					Gold	Mercury	Thallium	Lead	Bismuth	Polonium	
					Rg	Cn	Nh	Fl	Mc	Lv	
										Ts	
										Og	
				</td							

CSE 215 Project - PeriodicTable/src/Elements/Modern_Periodic_Table.java - Eclipse IDE

File Edit Source Refactor Navigate Search Project Run Window Help

Periodic Table Search Elements Online Help Test Yourself Help

Modern Periodic Table with details

History of Modern Periodic Table

Details about Modern Periodic Table

Activate Windows
Settings to activate Windows.

Writable Smart Insert 2814 : 9

11:55 PM 25-Jan-20

CSE 215 Project - PeriodicTable/src/Elements/Modern_Periodic_Table.java - Eclipse IDE

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Periodic Table

History of the periodic table of chemical elements ::

In 1809 :

- At least 47 elements were discovered, and scientists began to see patterns in the characteristics.

In 1863 :

- English chemist John Newlands divided the then discovered 56 elements into 11 groups,
- based on characteristics.

In 1869 :

- Russian chemist Dimitri Mendeleev started the development of the periodic table, arranging chemical elements by atomic mass. He predicted the discovery of other elements,
- and left spaces open in his periodic table for them.

In 1894 :

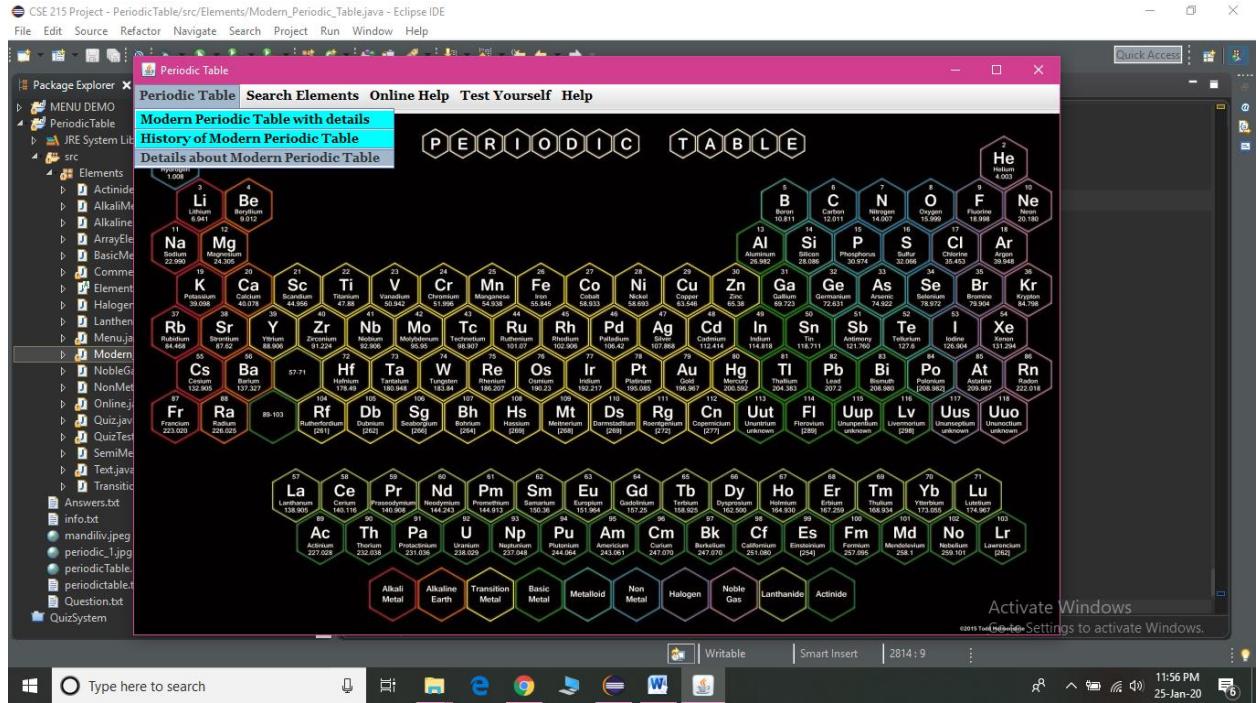
- Sir William Ramsay and Lord Rayleigh discovered the noble gases, which were added to the periodic table as group 0.

PRINT

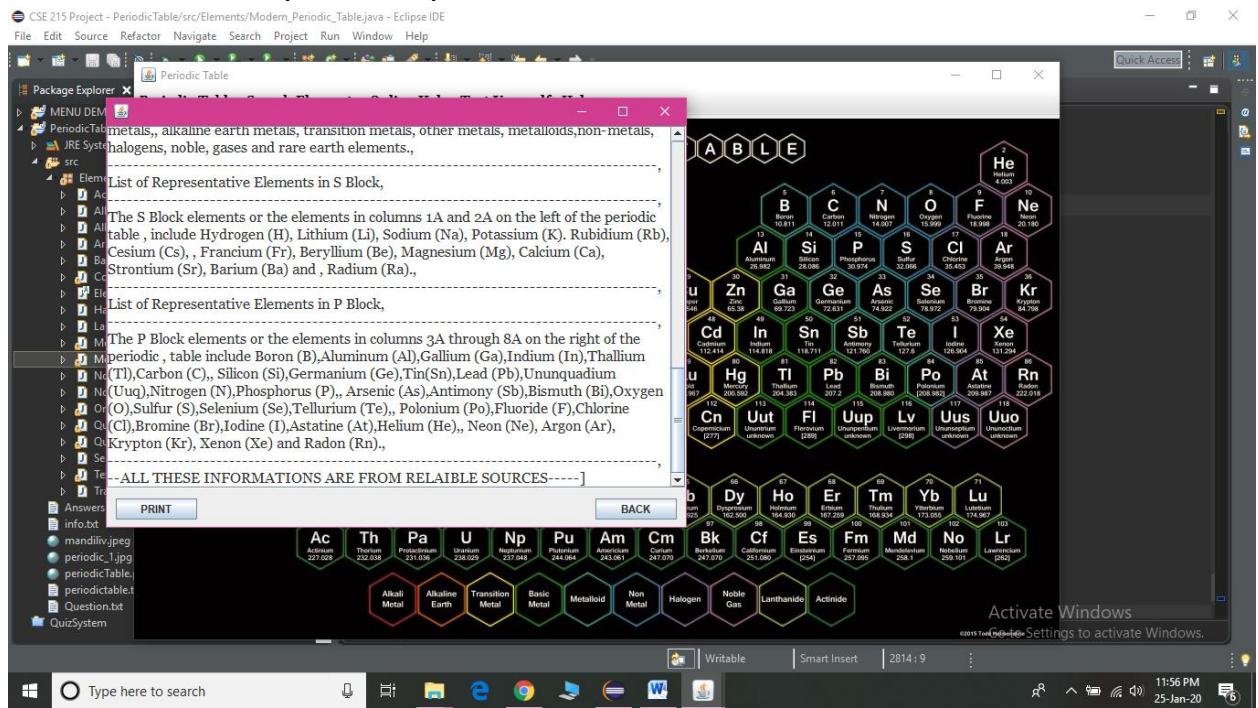
Activate Windows
Settings to activate Windows.

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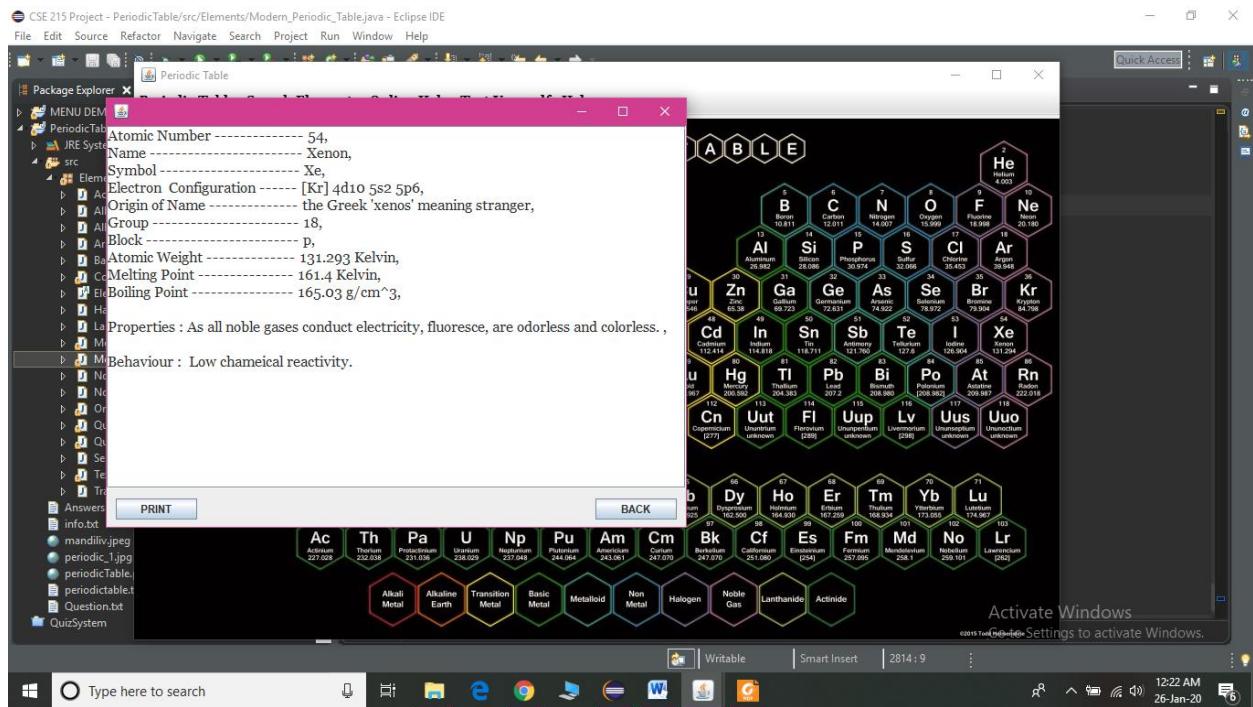
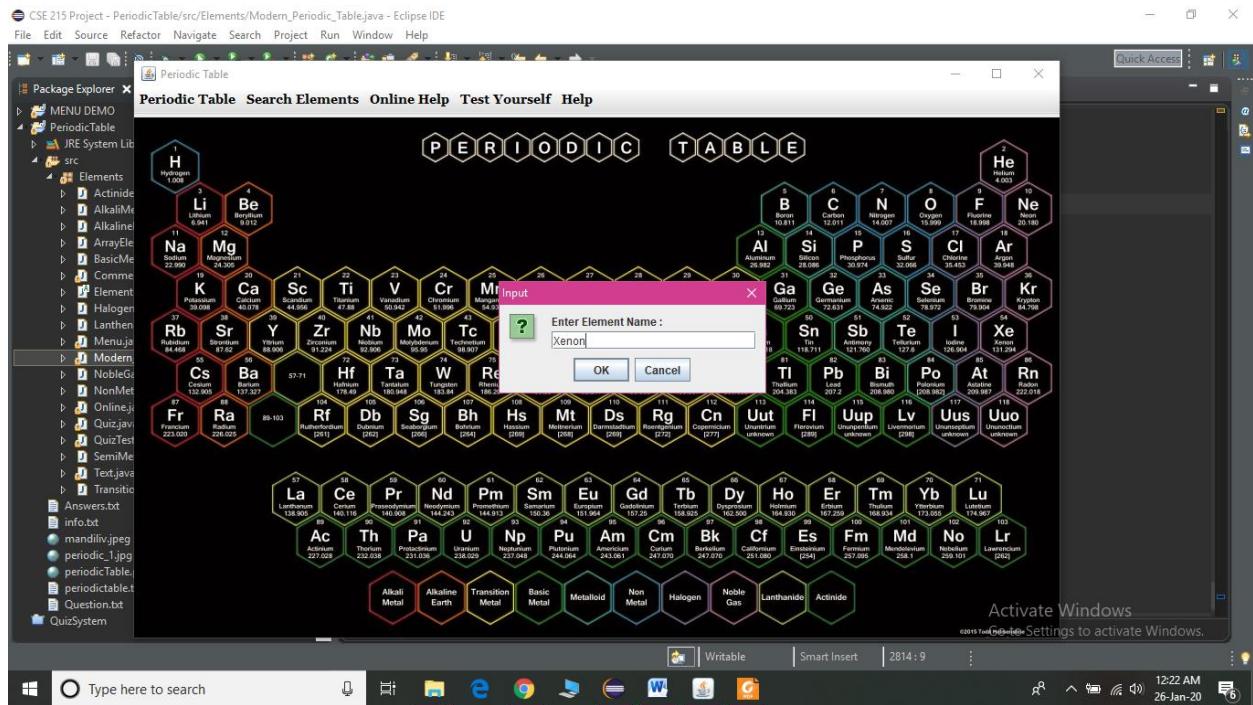


There is also an option for print this information as well.

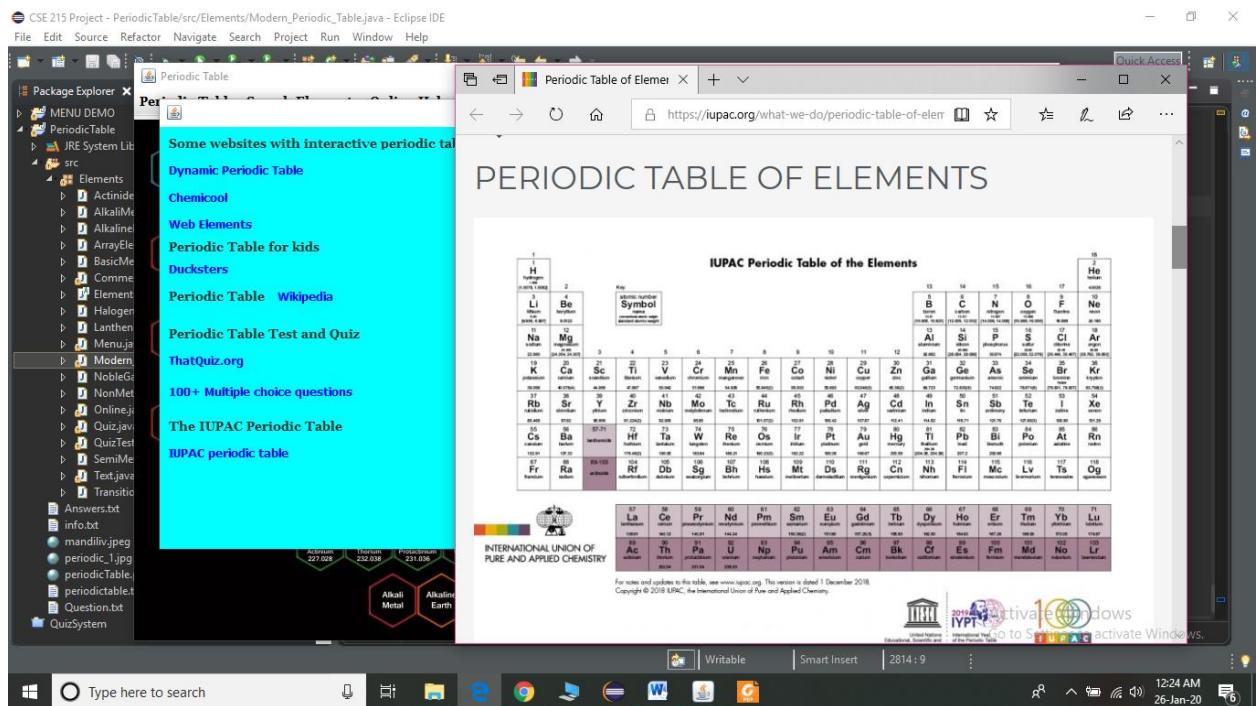
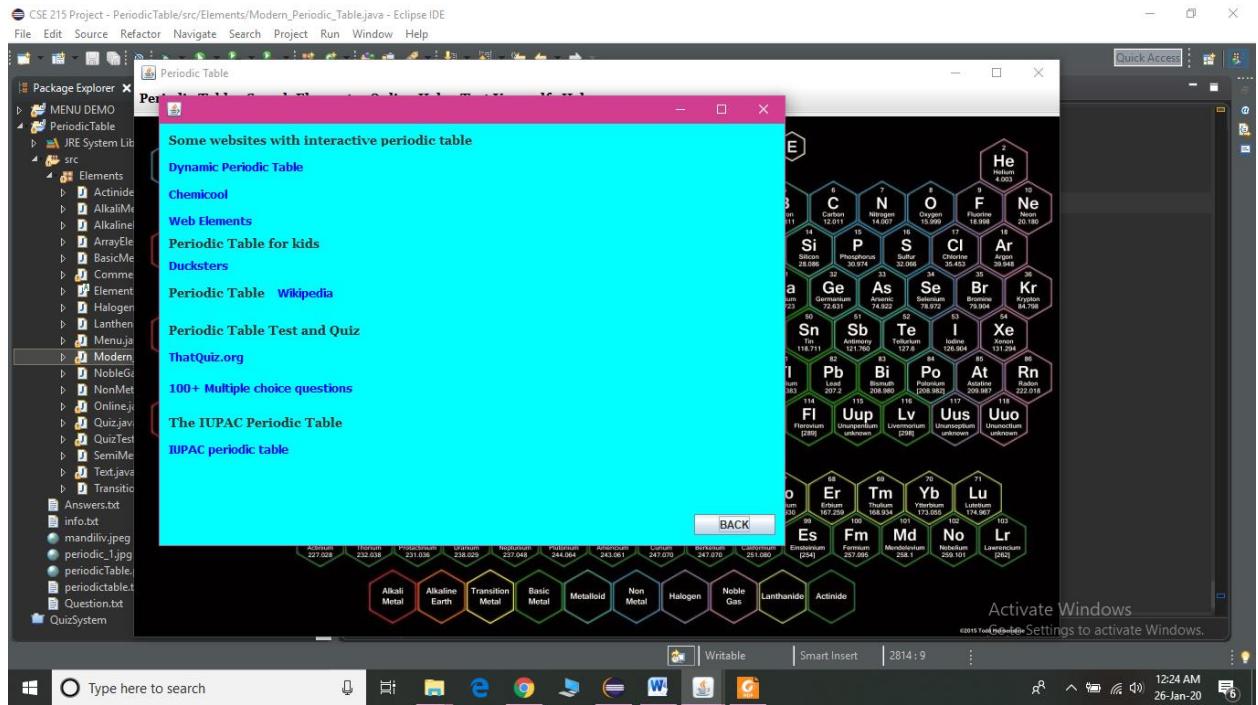


“SearchElements” option. There are three ways to search : search by name , search by number and search by symbol. And any wrong input shows an error message. Search by name option is shown here :

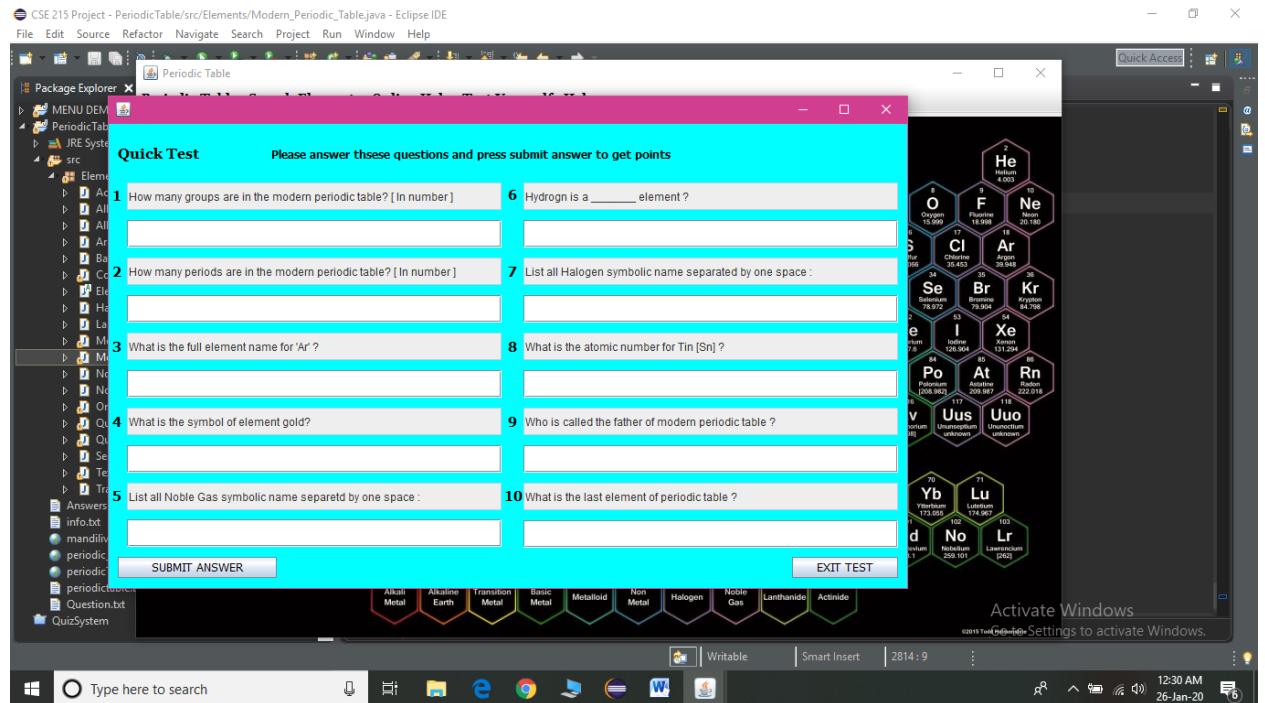
Example if enter Xenon :



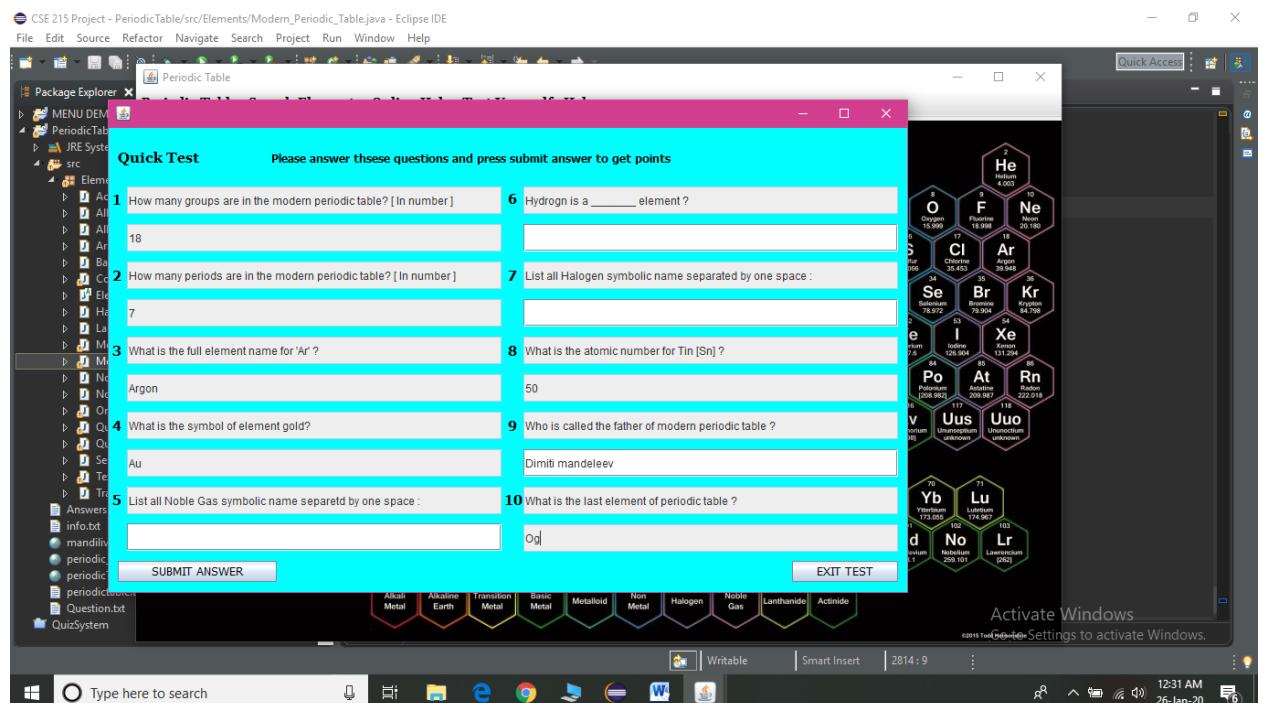
By clicking on the “Online Help ”option opens a new window with some online website links. If we click on the blue texts. The default browser opens and browse that page :



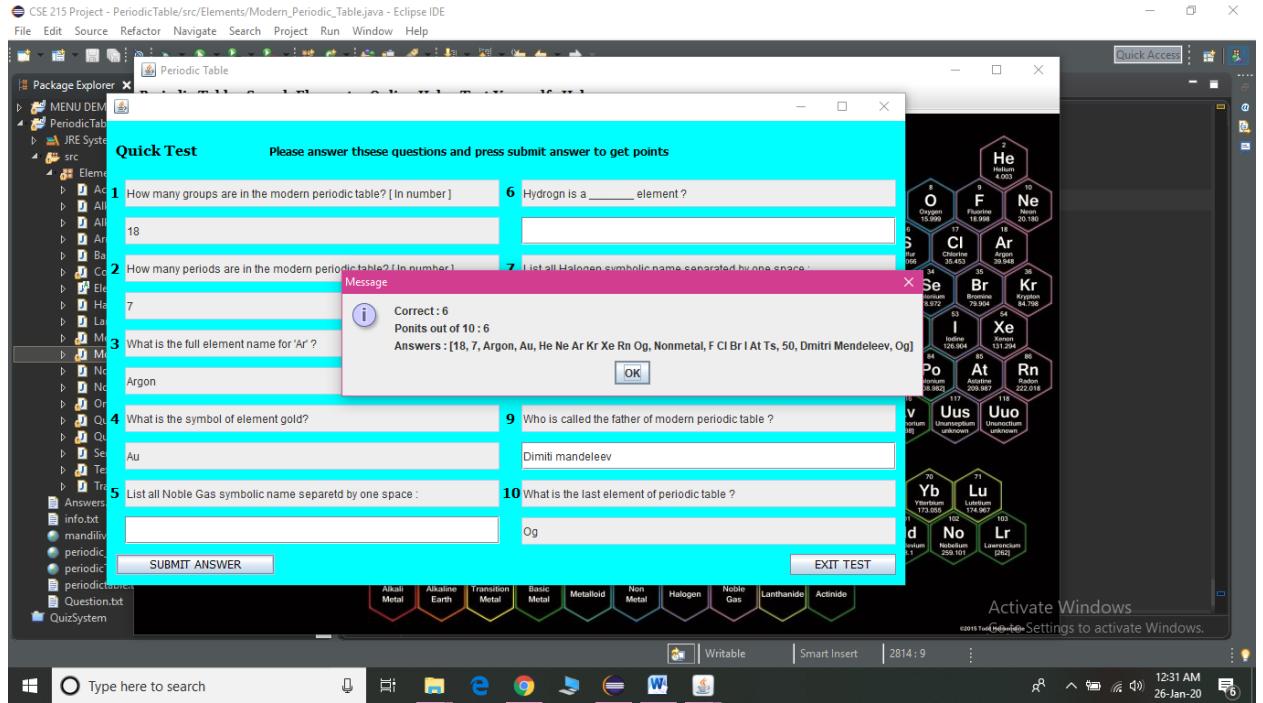
The Test Yourself option is a helpful option to test your general knowledge on periodic table.



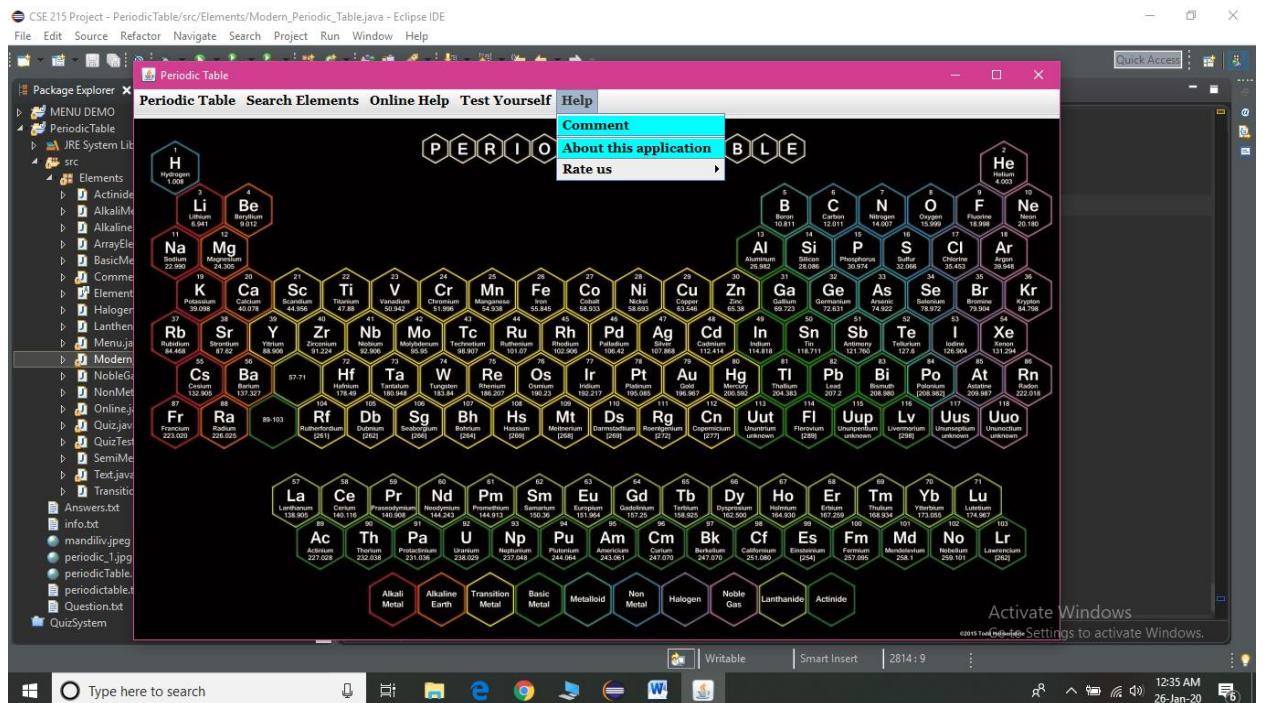
We can write the answers here and then submit it.



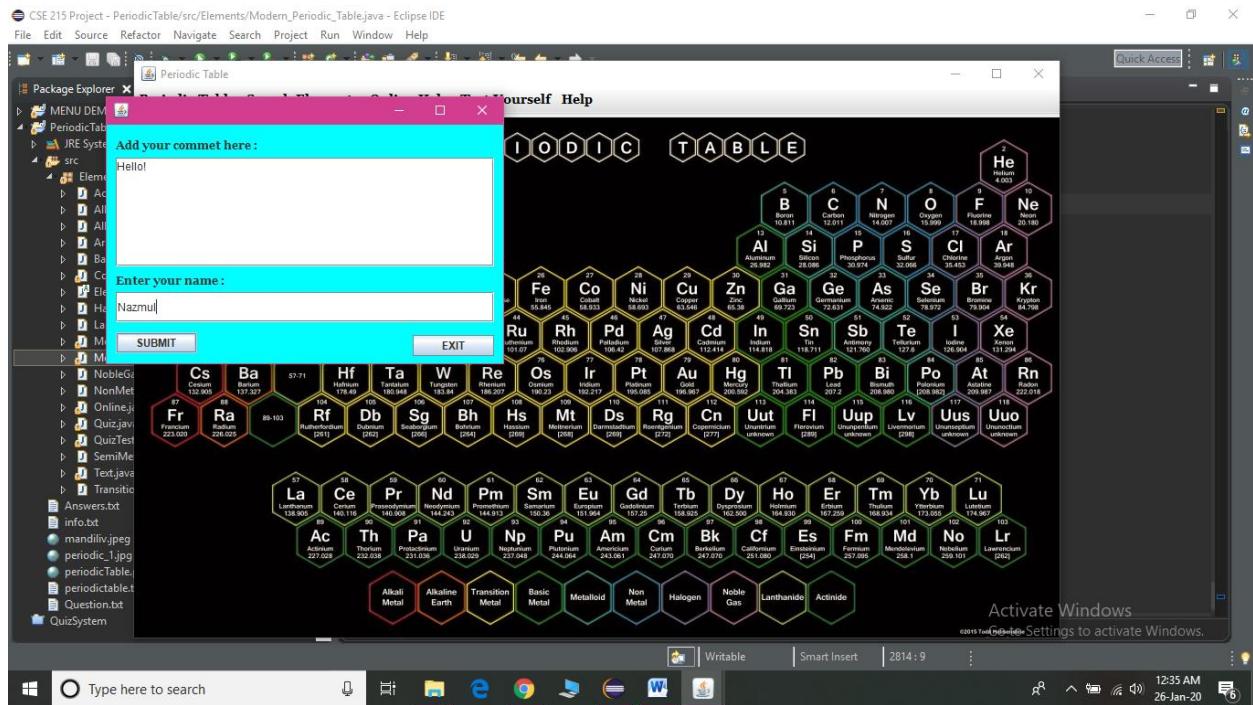
After submitting the answer total gained mark will be shown like :



"Help" has 3 more options : "Comment, About the application and rate us"



The comment option : User can comment about his feeling about it here. All the comments are printed in a file named comments.txt.



Comments :

File Home Share View Picture Tools Screenshots

Comment : Test comment. Hello!!!!!!!!!!
Commented by : Nazmul Hasan
Commented on : Sun Jan 05 09:36:03 BDT 2020

Comment : very good
Commented by : Bithi
Commented on : Sun Jan 05 10:03:09 BDT 2020

Comment : nice
Commented by : samya
Commented on : Sun Jan 05 11:58:04 BDT 2020

Comment : fdsdfwdw
Commented by : ehyer
Commented on : Sun Jan 05 13:41:31 BDT 2020

Comment : nice
Commented by : ratna
Commented on : Mon Jan 06 14:23:12 BDT 2020

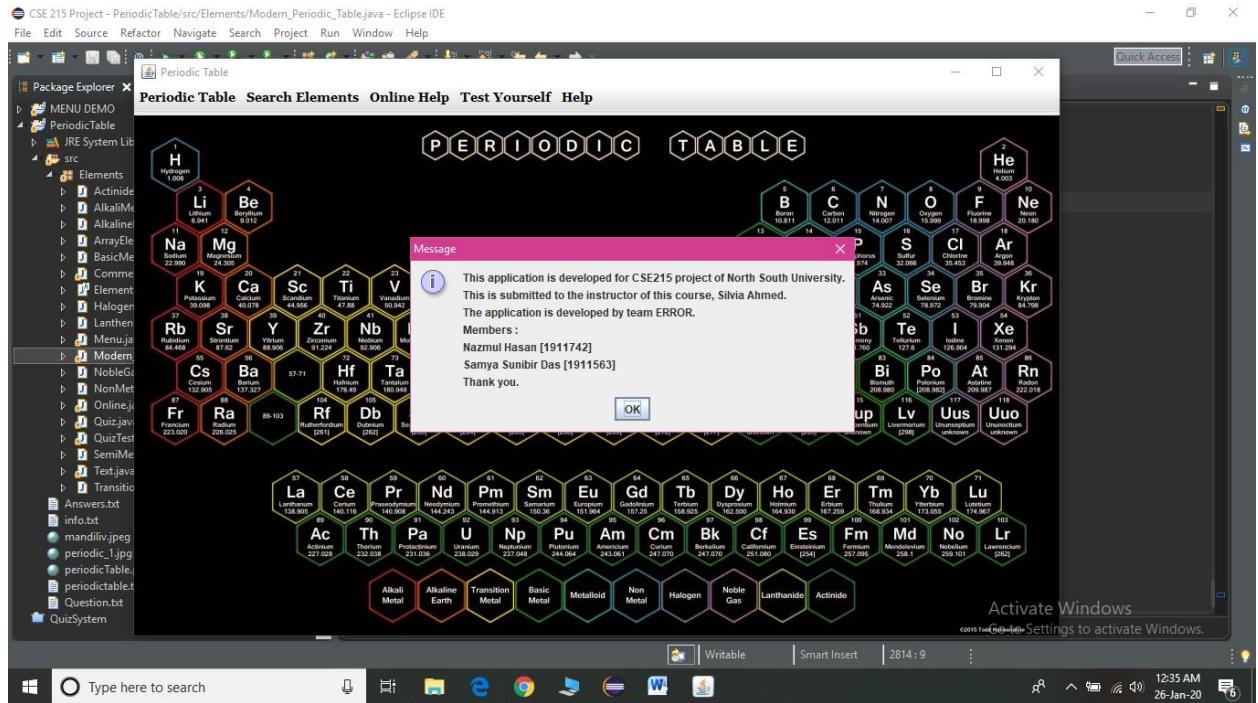
Comment : This is designed nicely. A perfect project. Please add account system. B
Commented by : Mahir
Commented on : Tue Jan 07 15:20:02 BDT 2020

Comment : Hello!
Commented by : Nazmul
Commented on : Sun Jan 26 00:35:34 BDT 2020

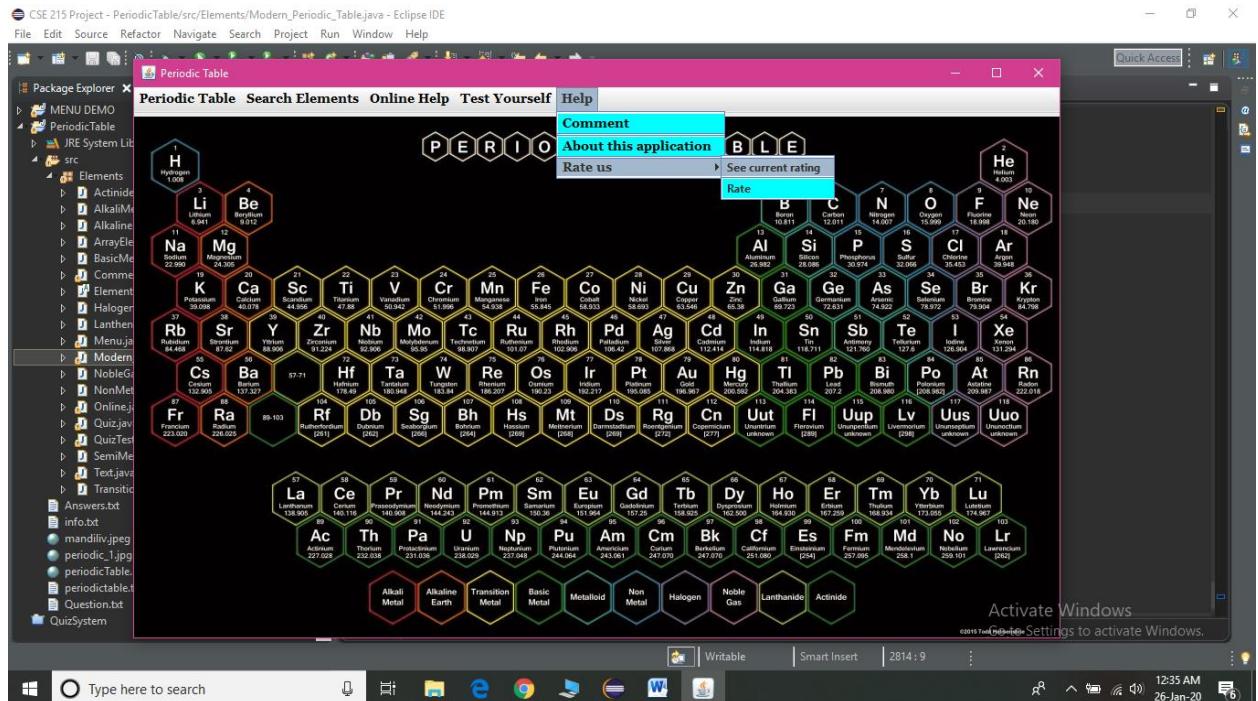
File Edit Format View Help

Activate Windows
Go to Settings to activate Windows.

About the application :



User can rate it and see the current rating from here :



THANKS FOR USING