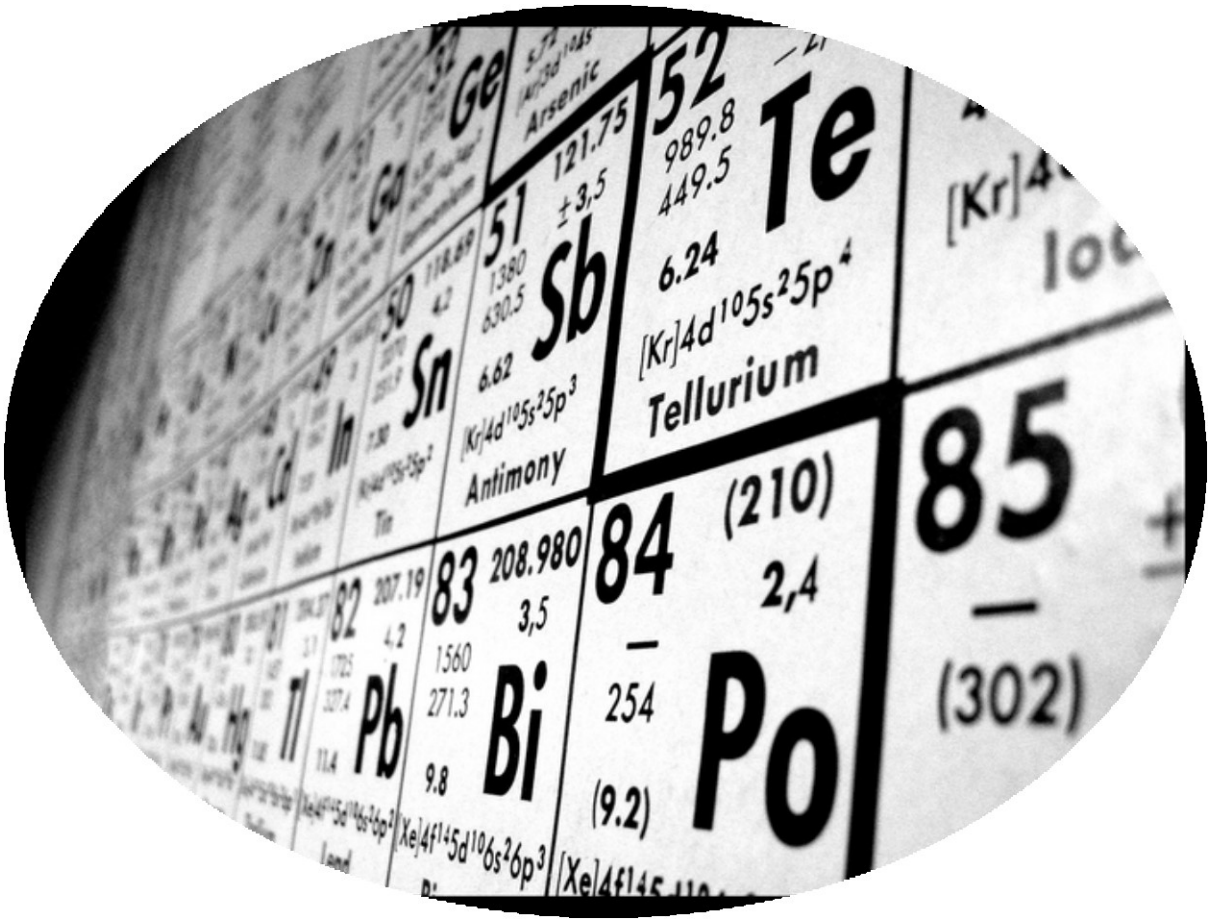
Computer Science Project



Periodic Table

By

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Roll No: 4619368

CERTIFICATE

This is to certify that **Vilas M** *of Class* **12** *has satisfactorily completed his Project in Computers – **Periodic Table** as prescribed by the Central Board of Secondary Education for* **AISSCE- 2015.**

Signature of Teacher-in-charge

Signature of the External Examiner

Official School Seal:

Date of Examination:

Registration Number: **4619368**

Acknowledgment

Acknowledgement is a wonderful way of expressing your gratitude.

I am greatly indebted to my Computer Science Teacher, Mr. Girish S. for his guidance and support throughout this project.

I also thank my parents for being a constant source of encouragement.

Vilas M

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Objective:

To develop an interactive software for managing the Periodic Table using the C++ Language.

Requirements:

Hardware:

- Processor Pentium 4 or above
- 512 MB RAM (Minimum)
- Hard Disk 20 GB

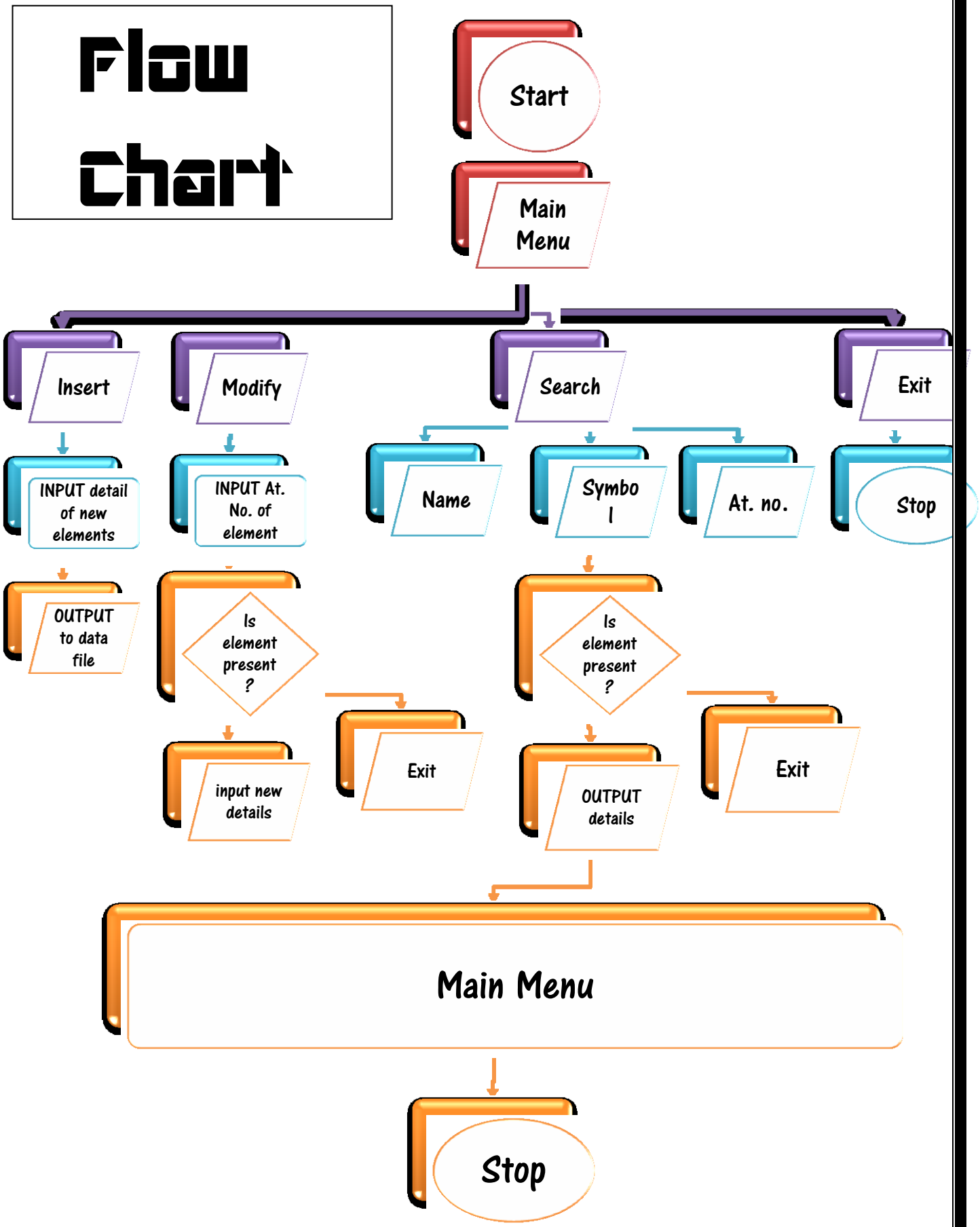
Software:

- Windows XP or a higher version
- Turbo or Borland C++

Header Files:

1) <stdio.h>
2) <conio.h>
3) <fstream.h>
4) <iomanip.h>
5) <string.h>
6) <process.h>

Flow Chart


Start
Main Menu
Insert
Modify
Search
Exit
INPUT detail of new elements
INPUT At. No. of element
Name
Symbo l
At. no.
Stop
OUTPUT to data file
Is element present ?
Is element present ?
Exit
input new details
Exit
OUTPUT details
Main Menu
Stop

Source Code:

```
#include<iostream.h>
 #include<stdio.h>
 #include<conio.h>
 #include<fstream.h>
 #include<iomanip.h>
 #include<string.h>
 #include<process.h>

 class element              //Declaration of class element
 {
   int atomic_no;
   float atomic_mass, elec_neg ;
   char name[15], symbol[3], elec_config[50];

   public:

   void input(void);
   void output(void);
   int get_atm_no(void);
   int get_name(char str[]);
   int get_sym(char str[]);
```

```
};                          //End of class declaration

 void element::input()          //Function to input details
{
 cout<<endl<<"\tName: ";
 gets(name);
 cout<<endl<<"\tAtomic Number: ";
 cin>>atomic_no;
 cout<<endl<<"\tAtomic Mass: ";
 cin>>atomic_mass;
 cout<<endl<<"\tSymbol: ";
 gets(symbol);
 cout<<endl<<"\tElectronic Configuration: ";
 gets(elec_config);
 cout<<endl<<"\tElectronegativity: ";
 cin>>elec_neg;

};

void element::output()              //Function to output details
{
 clrscr();
 gotoxy(25,7);
 cout<<"Details of the element:";
 gotoxy(15,9);
 cout<<"Name: "<<name;
 gotoxy(15,11);
```

```
cout<<"Atomic Number: "<<atomic_no;
gotoxy(15,13);
cout<<"Atomic Mass: "<<atomic_mass;
gotoxy(15,15);
cout<<"Symbol: "<<symbol;
gotoxy(15,17);
cout<<"Electronic Configuration: ";
gotoxy(15,19);
cout<<elec_config;
gotoxy(15,21);
cout<<"Electronegativity: "<<elec_neg;
gotoxy(10,5);

for(int j=0; j<50; j++)

{
cout<<"*";
}

for(int i=0; i<20; i++)
{
gotoxy(10,i+5);
cout<<"*";
gotoxy(60,i+5);
cout<<"*";
}
gotoxy(10,24);
```

```
 for(i=0;i<50; i++)
 {
 cout<<"*";
 };
};


int element::get_atm_no()          /*Function to return
                                   the value of atomic number*/
{
 return(atomic_no);
};

int element::get_name(char str[])     /*Function to compare the
                                      name with the argument*/
 {  int r;

    if(strcmpi(name,str)==0)
 {
   r=0;
 }
    else
 {
   r=1;
 } ;
```

```
 return r;
};

int element::get_sym(char str[])    /*Function to compare the symbol
                                    with the argument*/
{
 int r;
 if(strcmpi(symbol,str)==0)
 {
r=0;
 }

 else
 {
r=1;
 } ;
 return r;
};

void display()                      //Main Page
{
 clrscr();

 gotoxy(30,2);
 cout<<"THE PERIODIC TABLE";
 gotoxy(13,5);  cout<<"H";
 gotoxy(13,7);  cout<<"Li";
```

```
gotoxy(13,9);  cout<<"Na";
gotoxy(13,11); cout<<"K";
gotoxy(13,13); cout<<"Rb";
gotoxy(13,15); cout<<"Cs";
gotoxy(13,17); cout<<"Fr";
gotoxy(16,7);  cout<<"Be";
gotoxy(16,9);  cout<<"Mg";
gotoxy(16,11); cout<<"Ca";
gotoxy(16,13); cout<<"Sr";
gotoxy(16,15); cout<<"Ba";
gotoxy(16,17); cout<<"Ra";
gotoxy(19,11); cout<<"Sc";
gotoxy(19,13); cout<<"Y";
gotoxy(19,15); cout<<"La";
gotoxy(19,17); cout<<"Ac";
gotoxy(22,11); cout<<"Ti";
gotoxy(22,13); cout<<"Zr";
gotoxy(22,15); cout<<"Hf";
gotoxy(22,17); cout<<"Rf";
gotoxy(25,11); cout<<"V";
gotoxy(25,13); cout<<"Nb";
gotoxy(25,15); cout<<"Ta";
gotoxy(25,17); cout<<"Ha";
gotoxy(28,11); cout<<"Cr";
gotoxy(28,13); cout<<"Mo";
gotoxy(28,15); cout<<"W";
gotoxy(28,17); cout<<"Un";
```

```
gotoxy(31,11); cout<<"Mn";
gotoxy(31,13); cout<<"Tc";
gotoxy(31,15); cout<<"Re";
gotoxy(31,17); cout<<"Ns";
gotoxy(34,11); cout<<"Fe";
gotoxy(34,13); cout<<"Ru";
gotoxy(34,15); cout<<"Os";
gotoxy(34,17); cout<<"Hs";
gotoxy(37,11); cout<<"Co";
gotoxy(37,13); cout<<"Rh";
gotoxy(37,15); cout<<"Ir";
gotoxy(37,17); cout<<"Mt";
gotoxy(40,11); cout<<"Ni";
gotoxy(40,13); cout<<"Pd";
gotoxy(40,15); cout<<"Pt";
gotoxy(40,17); cout<<"Uun";
gotoxy(43,11); cout<<"Cu";
gotoxy(43,13); cout<<"Ag";
gotoxy(43,15); cout<<"Au";
gotoxy(46,11); cout<<"Zn";
gotoxy(46,13); cout<<"Cd";
gotoxy(46,15); cout<<"Hg";
gotoxy(49,7);  cout<<"B";
gotoxy(49,9);  cout<<"Al";
gotoxy(49,11); cout<<"Ga";
gotoxy(49,13); cout<<"In";
gotoxy(49,15); cout<<"Tl";
```

```
gotoxy(52,7);  cout<<"C";
gotoxy(52,9);  cout<<"Si";
gotoxy(52,11); cout<<"Ge";
gotoxy(52,13); cout<<"Sn";
gotoxy(52,15); cout<<"Pb";
gotoxy(55,7);  cout<<"N";
gotoxy(55,9);  cout<<"P";
gotoxy(55,11); cout<<"As";
gotoxy(55,13); cout<<"Sb";
gotoxy(55,15); cout<<"Bi";
gotoxy(58,7);  cout<<"O";
gotoxy(58,9);  cout<<"S";
gotoxy(58,11); cout<<"Se";
gotoxy(58,13); cout<<"Te";
gotoxy(58,15); cout<<"Po";
gotoxy(61,7);  cout<<"F";
gotoxy(61,9);  cout<<"Cl";
gotoxy(61,11); cout<<"Br";
gotoxy(61,13); cout<<"I";
gotoxy(61,15); cout<<"At";
gotoxy(64,5);  cout<<"He";
gotoxy(64,7);  cout<<"Ne";
gotoxy(64,9);  cout<<"Ar";
gotoxy(64,11); cout<<"Kr";
gotoxy(64,13); cout<<"Xe";
gotoxy(64,15); cout<<"Rn";
gotoxy(13,21); cout<<"Lanthanides";
```

```
gotoxy(25,21); cout<<"Ce";
gotoxy(28,21); cout<<"Pr";
gotoxy(31,21); cout<<"Nd";
gotoxy(34,21); cout<<"Pm";
gotoxy(37,21); cout<<"Sm";
gotoxy(40,21); cout<<"Eu";
gotoxy(43,21); cout<<"Gd";
gotoxy(46,21); cout<<"Tb";
gotoxy(49,21); cout<<"Dy";
gotoxy(52,21); cout<<"Ho";
gotoxy(55,21); cout<<"Er";
gotoxy(58,21); cout<<"Tm";
gotoxy(61,21); cout<<"Yb";
gotoxy(64,21); cout<<"Lu";
gotoxy(13,23); cout<<"Actinides";
gotoxy(25,23); cout<<"Th";
gotoxy(28,23); cout<<"Pa";
gotoxy(31,23); cout<<"U";
gotoxy(34,23); cout<<"Np";
gotoxy(37,23); cout<<"Pu";
gotoxy(40,23); cout<<"Am";
gotoxy(43,23); cout<<"Cm";
gotoxy(46,23); cout<<"Bk";
gotoxy(49,23); cout<<"Cf";
gotoxy(52,23); cout<<"Ea";
gotoxy(55,23); cout<<"Fm";
gotoxy(58,23); cout<<"Md";
```

```
gotoxy(61,23); cout<<"No";
gotoxy(64,23); cout<<"Lr";

gotoxy(11,30);
cout<<"MAIN MENU";
cout<<endl;

cout<<endl<<"\t1.Insert a new element";
cout<<endl<<"\t2.Modify a new element";
cout<<endl<<"\t3.Search for an element";
cout<<endl<<"\t4.Exit";
cout<<endl<<endl<<"\tPlease select an option: ";

int opt;
cin>>opt;

void insert(void);
void modify(void);
void search(void);

switch(opt)
{
 case 1:  insert();
    break;

 case 2:  modify();
    break;
```

```
    case 3:  search();
       break;

    case 4:  exit(0);
       break;

    default: cout<<endl<<"\tInvalid option";
       getch();
       display();
       break;
    }
};

void insert()           //Function to insert data
{
  clrscr();
  ofstream fout;
  element e;
  fout.open("element.dat",ios::in|ios::app);
  char ans='y';

  while(ans=='y')
  {
    cout<<endl<<"\tEnter the details of the element to be inserted: ";
    cout<<endl<<endl;
    e.input();
```

```
    fout.write((char*)&e, sizeof(e));
    cout<<endl<<endl<<"\tThe element has been added";
    cout<<endl<<"\tDo you wish to add more elements? (y/n) . . . ";
    cin>>ans;
  }

 fout.close();
 display();
 }

 void modify()              //Function to modify data
 {
  clrscr();
  element e;
  fstream fio("element.dat", ios::in|ios::out|ios::binary);
  int at_no; long pos; char found='f';
  cout<<endl<<"\tEnter the atomic number of the element to be
modified: ";
  cin>>at_no;

   while(!fio.eof()&&found=='f')
   {
    pos= fio.tellg();
    fio.read((char*)&e,sizeof(e));
  if(e.get_atm_no()==at_no)
  {
   cout<<endl<<"\tEnter the new details of the element: ";
```

```
 e.input();
 fio.seekp(pos);
 fio.write((char*)&e,sizeof(e));
 found='t';
};
 };

fio.close();
if(found=='f')
cout<<endl<<endl<<"\tElement not found!";
cout<<endl<<endl<<"\tPress any key to go to the main menu. . . ";
getch();
void display(void);
display();
}

void search()    //Function for the search page
{
 clrscr();
 gotoxy(20,2);
 cout<<"SEARCH: ";
 gotoxy(19,3);

 for(int i = 0; i<9 ; i++)
 {
cout<<"=";
 }
```

```
    gotoxy(1,7);
    cout<<"\tSearch by? :";
    cout<<endl<<"\t1. Element Name";
    cout<<endl<<"\t2. Atomic Number";
    cout<<endl<<"\t3. Element Symbol";
    cout<<endl<<endl<<"\tEnter an option: ";
    int opt,Num,found=0; char str[15];
    cin>>opt;
    ifstream fin;
    element e;
    fin.open("element.dat",ios::in);

    switch(opt)
   {
    case 1:
    cout<<endl<<endl<<"\tEnter the name of the element to be
searched: ";
    gets(str);

   while(!fin.eof()&&found==0)
  {
   fin.read((char*)&e, sizeof(e));
          if(e.get_name(str)==0)
          {
                found=1;
          };
  };
```

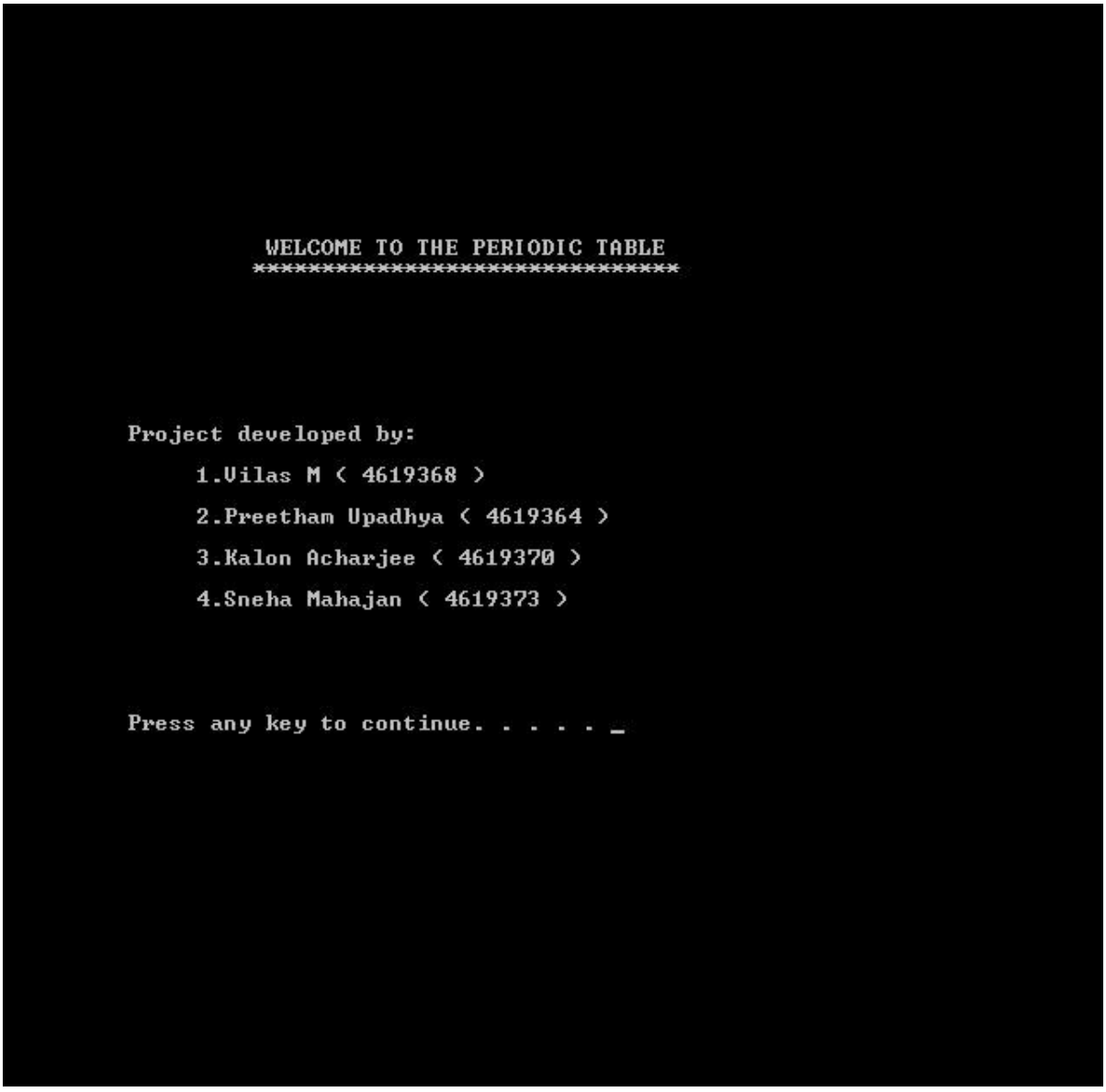
```
    break;


    case 2:
    cout<<endl<<endl;
    cout<<"\tEnter the atomic number of the element to be searched: ";
    cin>>Num;


  while(!fin.eof()&&found==0)
  {
  fin.read((char*)&e, sizeof(e));


  if(e.get_atm_no()==Num)
  {
        found=1;
  };


  };
    break;


    case 3:
    cout<<endl<<endl<<"\tEnter the symbol of the element to be
searched: ";
    gets(str);


  while(!fin.eof()&&found==0)
  {
  fin.read((char*)&e, sizeof(e));
```

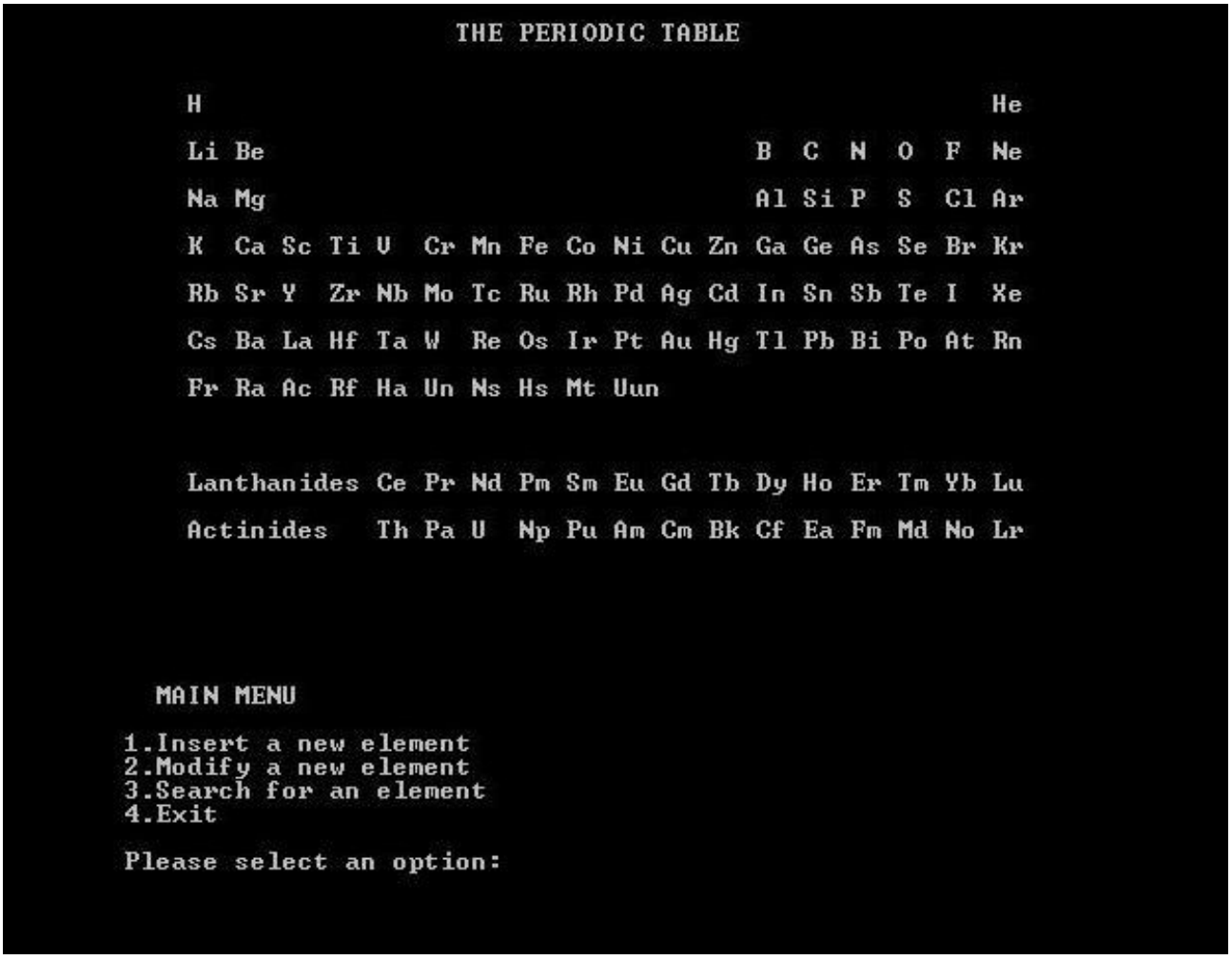
```
if(e.get_sym(str)==0)
{
        found=1;
};

};

 break;

 default:
 cout<<endl<<endl<<"\Invalid Choice";
 break;
 }

 if(opt==1||opt==2||opt==3)
 {
  cout<<endl<<endl<<endl<<setw(25)<<"SEARCH RESULTS";
if(found==1)
{
cout<<endl<<endl<<"\tElement found! ";
cout<<endl<<endl<<endl<<"\tPress any key to display the element . .
. . .";
getch();
clrscr();
e.output();
cout<<endl<<endl<<endl<<endl;
```

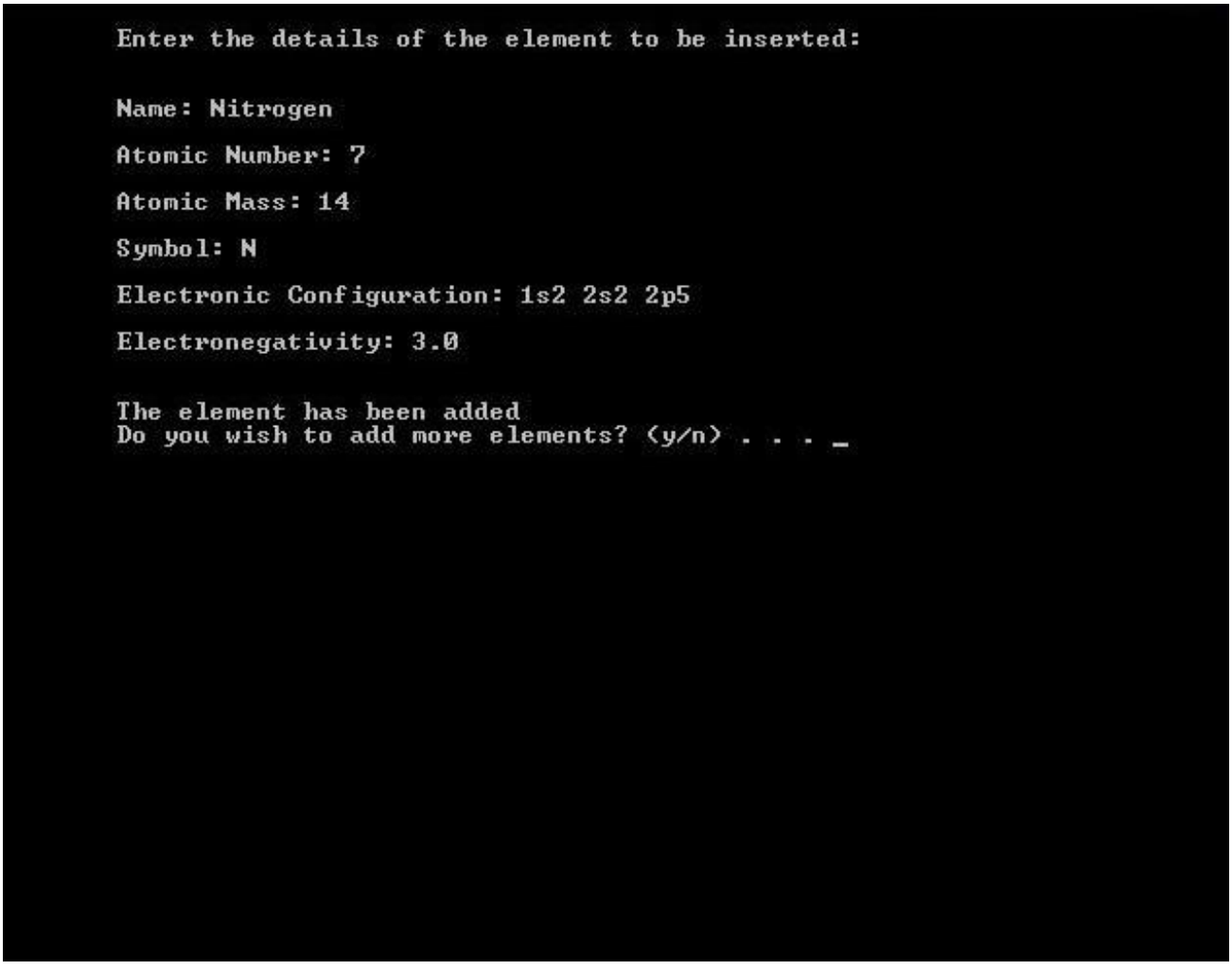
```
 cout<<"\tPress any key to go to the main menu. . . .";
 getch();
 display();
 }

 else
 { cout<<endl<<endl<<setw(5)<<"Sorry! Element not found. ";
  cout<<endl<<endl<<endl<<endl;
  cout<<"Press any key to go to the main menu. . . .";
  getch();
  display();
 }
  }

  else
  {
   cout<<endl<<endl<<endl<<"Press any key to go to the main menu.
. . .";
   getch();
   display();
  }
 };


 int main()
{
 clrscr();
```

```
gotoxy(20,10);
cout<<"WELCOME TO THE PERIODIC TABLE";
gotoxy(19,11);

for(int i=0; i<31 ; i++)
{
cout<<"*";
};

gotoxy(10,19);
cout<<"Project developed by:";
gotoxy(15,21);
cout<<"1.Vilas M ( 4619368 ) ";
gotoxy(15,23);
cout<<"2.Preetham Upadhya ( 4619364 )";
gotoxy(15,25);
cout<<"3.Kalon Acharjee ( 4619370 ) ";
gotoxy(15,27);
cout<<"4.Sneha Mahajan ( 4619373 ) ";
gotoxy(10,33);
cout<<"Press any key to continue. . . . . ";
getch();
display();
getch();
return(0);
}
```

Output Screenshots:

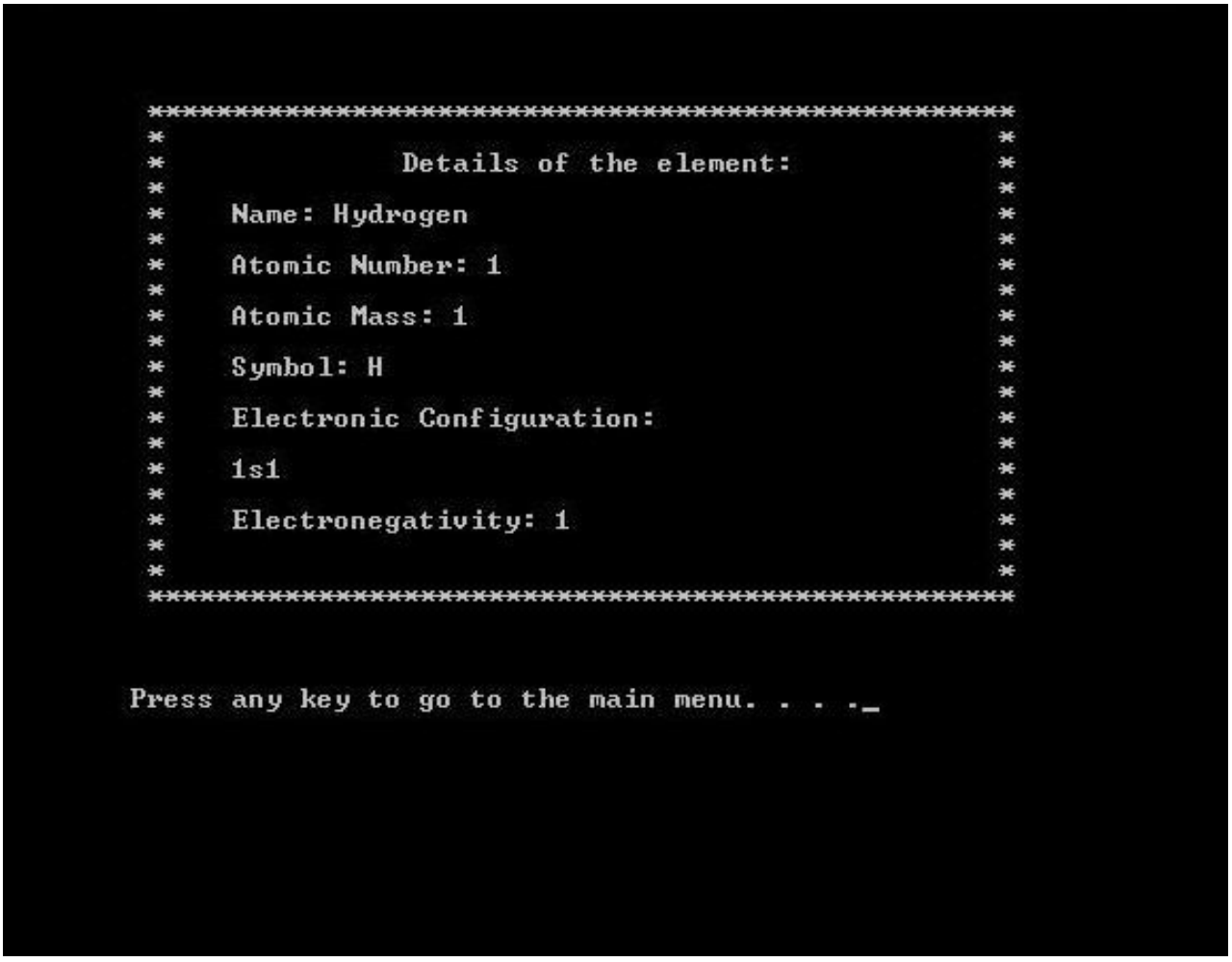


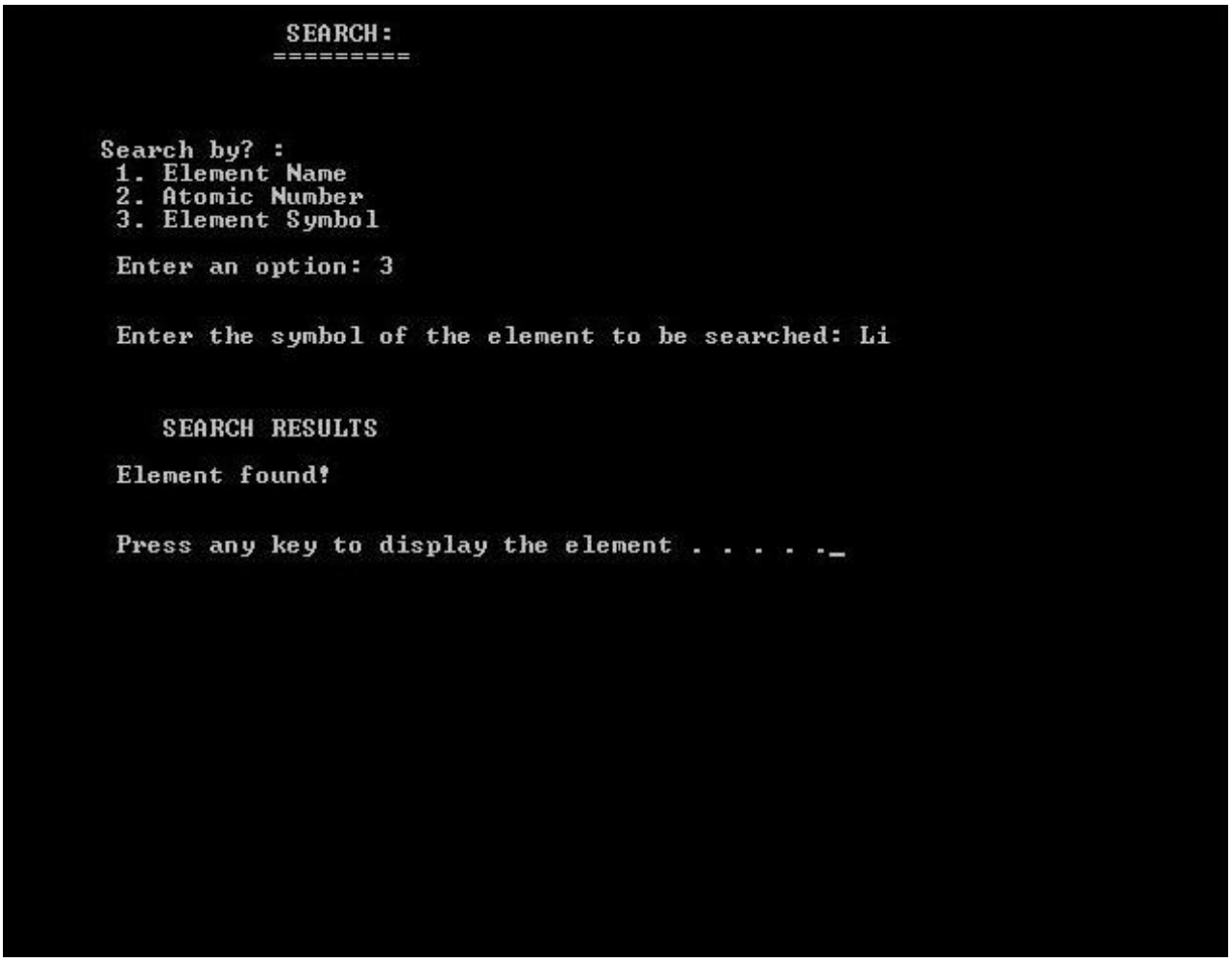

THE PERIODIC TABLE
H He
Li Be B C N O F Ne
Na Mg Al Si P S Cl Ar
K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe
Cs Ba La Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn
Fr Ra Ac Rf Ha Un Ns Hs Mt Uun
Lanthanides Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu
Actinides Th Pa U Np Pu Am Cm Bk Cf Ea Fm Md No Lr
MAIN MENU
1.Insert a new element
2.Modify a new element
3.Search for an element
4.Exit
Please select an option:

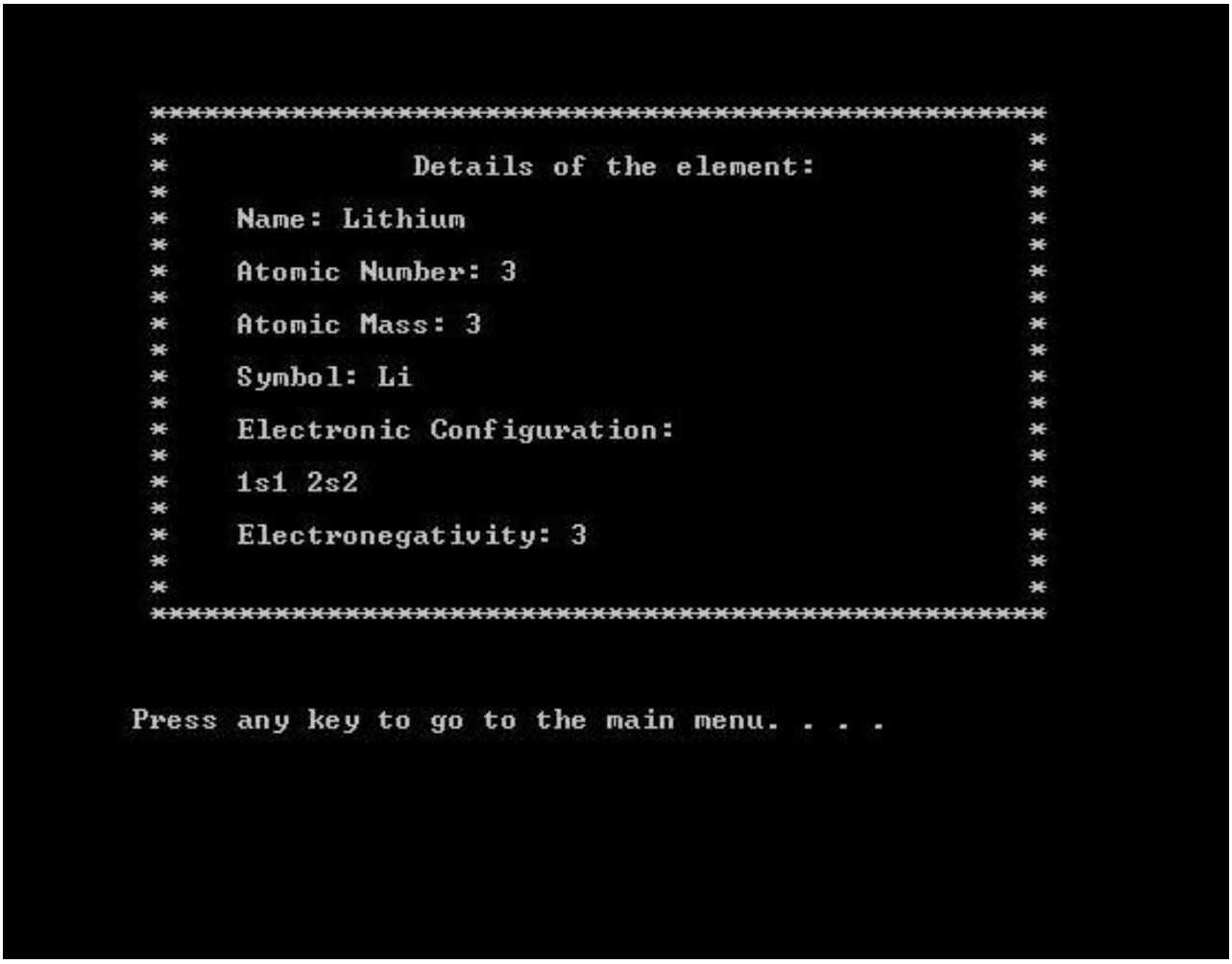

Enter the details of the element to be inserted:
Name: Nitrogen
Atomic Number: 7
Atomic Mass: 14
Symbol: N
Electronic Configuration: 1s2 2s2 2p5
Electronegativity: 3.0
The element has been added
Do you wish to add more elements? (y/n) . . . _

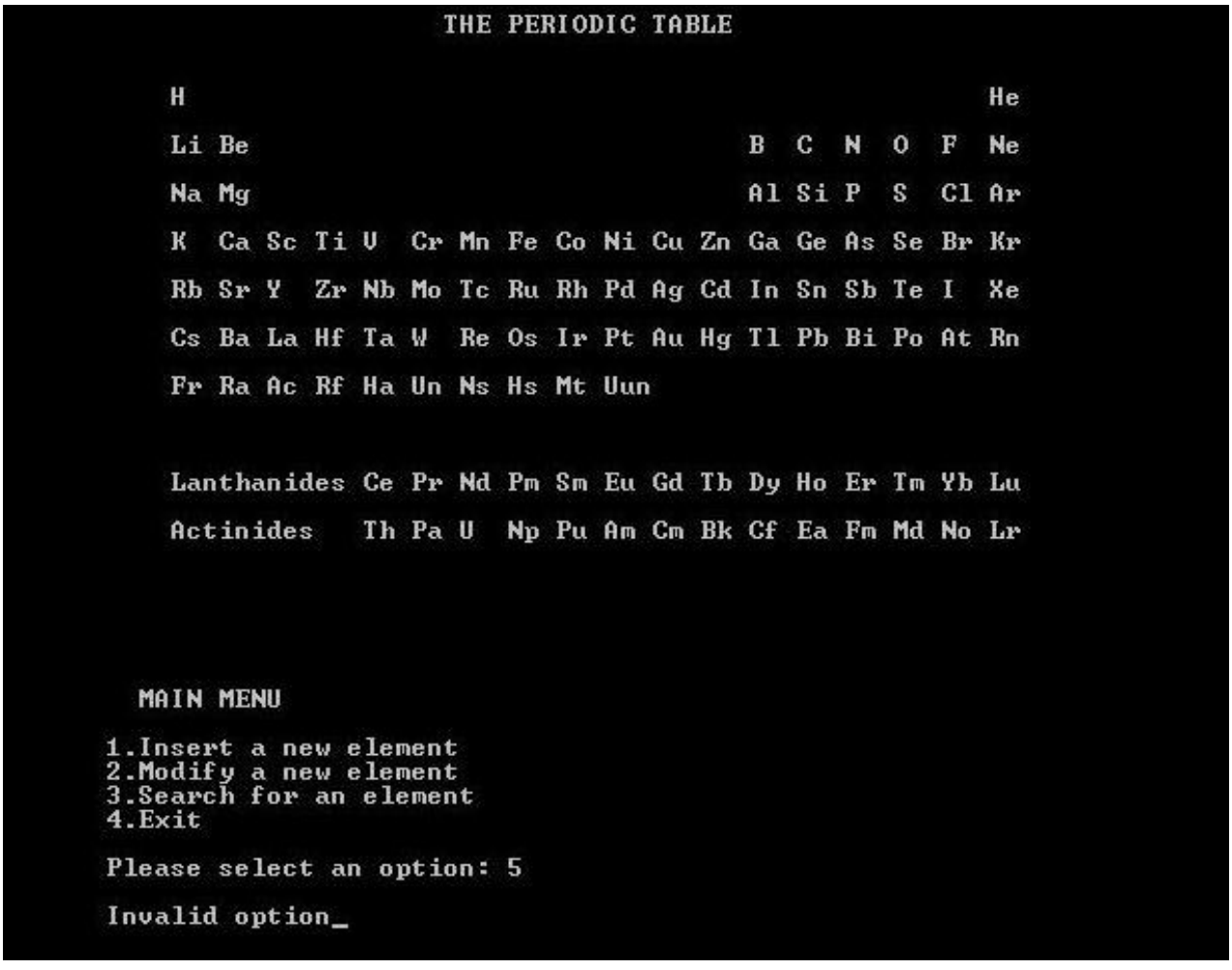
```
Enter the atomic number of the element to be modified: 7

Enter the new details of the element:
Name: Nitrogen

Atomic Number: 7

Atomic Mass: 14

Symbol: N

Electronic Configuration: 1s2 2s2 2p5

Electronegativity: 3.1

Press any key to go to the main menu. . . _
```

```
            SEARCH:
           =========


Search by? :
 1. Element Name
 2. Atomic Number
 3. Element Symbol

 Enter an option: 1

 Enter the name of the element to be searched: Hydrogen


    SEARCH RESULTS

 Element found!

 Press any key to display the element . . . . ._
```


Details of the element:
Name: Hydrogen
Atomic Number: 1
Atomic Mass: 1
Symbol: H
Electronic Configuration:
1s1
Electronegativity: 1
Press any key to go to the main menu. . . .


SEARCH:
Search by? :
1. Element Name
2. Atomic Number
3. Element Symbol
Enter an option: 3
Enter the symbol of the element to be searched: Li
SEARCH RESULTS
Element found!
Press any key to display the element . . . . .


Details of the element:
Name: Lithium
Atomic Number: 3
Atomic Mass: 3
Symbol: Li
Electronic Configuration:
1s1 2s2
Electronegativity: 3
Press any key to go to the main menu. . . .


THE PERIODIC TABLE
H He
Li Be B C N O F Ne
Na Mg Al Si P S Cl Ar
K Ca Sc Ti V Cr Mn Fe Co Ni Cu Zn Ga Ge As Se Br Kr
Rb Sr Y Zr Nb Mo Tc Ru Rh Pd Ag Cd In Sn Sb Te I Xe
Cs Ba La Hf Ta W Re Os Ir Pt Au Hg Tl Pb Bi Po At Rn
Fr Ra Ac Rf Ha Un Ns Hs Mt Uun
Lanthanides Ce Pr Nd Pm Sm Eu Gd Tb Dy Ho Er Tm Yb Lu
Actinides Th Pa U Np Pu Am Cm Bk Cf Ea Fm Md No Lr
MAIN MENU
1.Insert a new element
2.Modify a new element
3.Search for an element
4.Exit
Please select an option: 5
Invalid option_