SYSTEM PROGRAMMING LABWORK(Credits:Sarvat Meer)

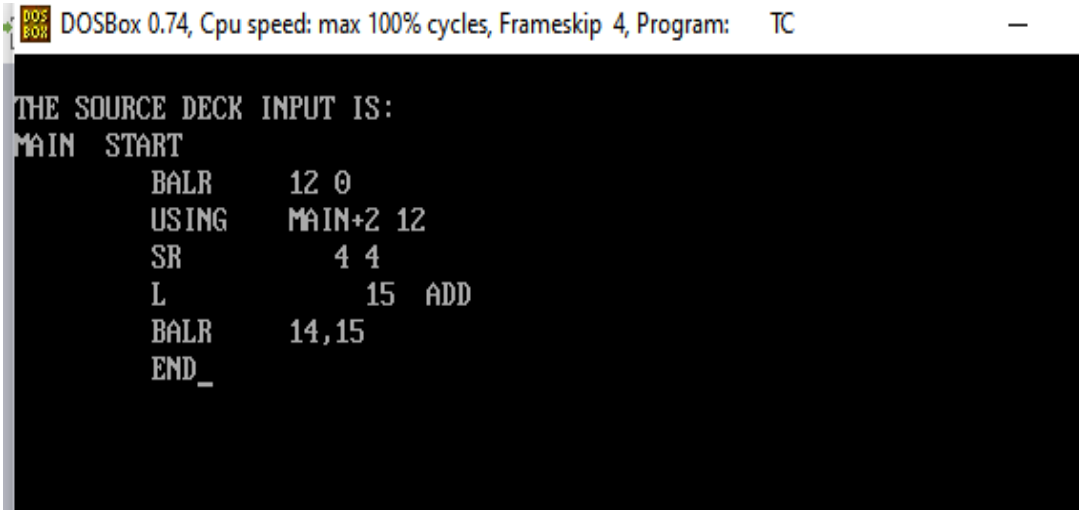
PROGRAM:Absolute linking loader simulation for the given program

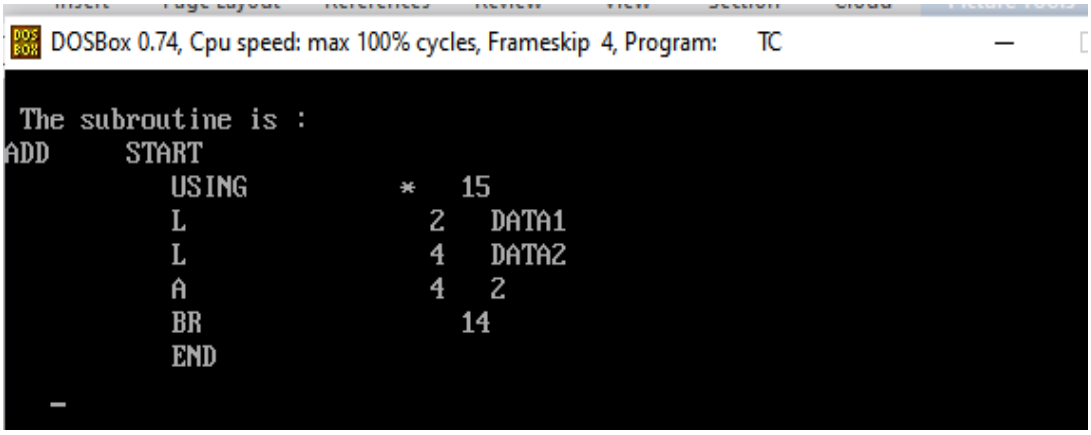
```
//This program takes as input the given program ,add subroutine and addresses
//where the main program and subroutine will be loaded and generates output deck
//showing where in memory each instruction will be loaded
//it doesnt take cards as input
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
#include<iostream.h>
#include<string.h>
FILE *f1,*f2,*f3,*f4,*f5;//f1 is pointer for spp.txt,f2 is for mot, f3 is for symbol table
//f4 is for psuedo op table
int addrmain,addrsub;// to store address of main and subrout
void readf(FILE *fp)
{
   rewind(fp);
   char ch=fgetc(fp);

   while(ch!=EOF)
   {
     if(ch!='X')
     cout<<ch;      ch=fgetc(fp);
   }
   getch();
}
char la[20],mne[20],opnd1[12],opnd2[12];
```

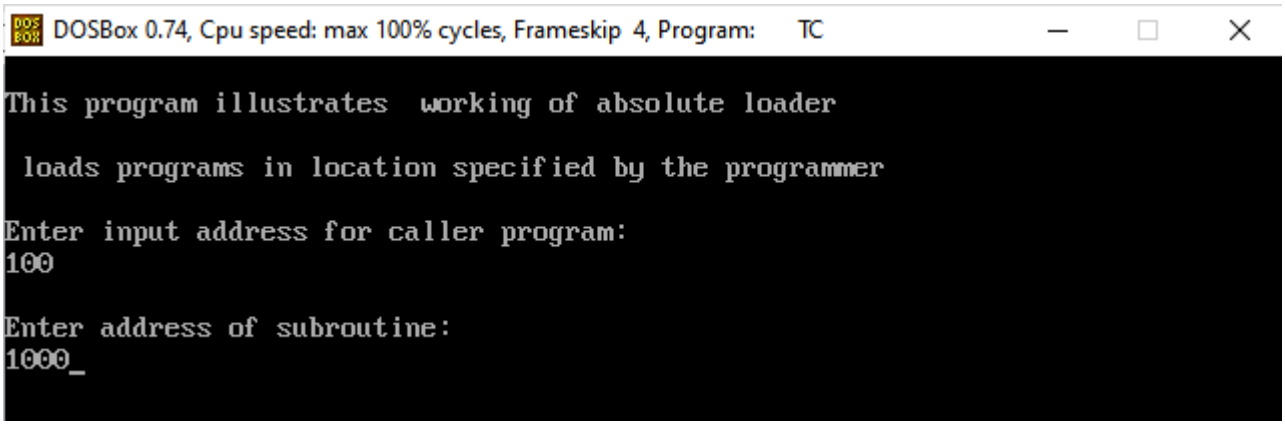
```
void absolute_loader(int temp,FILE *fp)
{      rewind(fp);
        fscanf(fp,"%s%s",la,mne);
        fprintf(f4,"\n%s:\t%s\n","SEGMENT NAME:",la);
        fscanf(fp,"%s%s%s%s",la,mne,opnd1,opnd2);
        int i=0;
        while(i++<4)
        {

      ab:
            //    if(strcmp(mne,"END")!=0)//if end not encountered yet
      //{
         //discard psuedo ops
         if(strcmp(mne,"USING")==0||strcmp(mne,"START")==0 )
            { fscanf(fp,"%s%s%s%s",la,mne,opnd1,opnd2);    //skip the instruction with psuedo ops
              goto ab;}
              //move to next one
         else    //process it if it contains machine op
          {    if(strcmp(opnd2,"ADD")==0)      //if there is call to subroutine
              {      temp+=4;
              fprintf(f4,"\n%d\t\t%s\t\t%s\t\t\t\t%s,%d\n",temp,la,mne,opnd1,addrsub);
              }
                else      //    else
                { temp+=2;
                fprintf(f4,"\n%d\t\t%s\t\t%s\t\t\t\t%s,%s\n",temp,la,mne,opnd1,opnd2);
                }
           }
            fscanf(fp,"%s%s%s%s",la,mne,opnd1,opnd2);
```

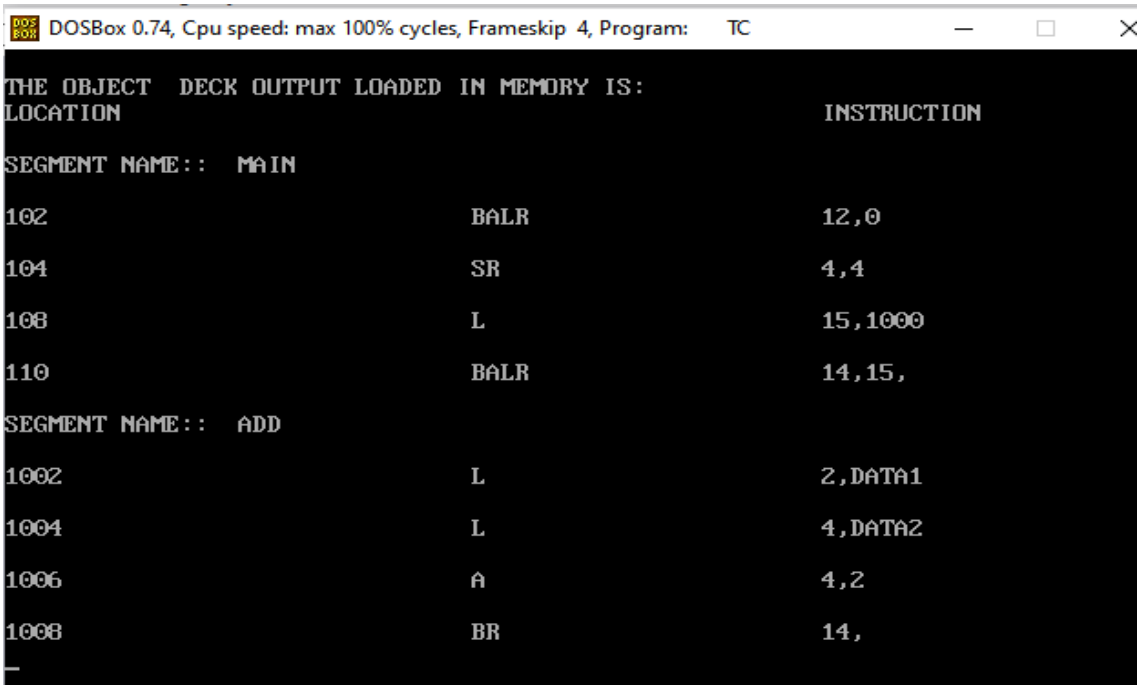
```
    //}//end if

     }

}


void main()
{                clrscr();
    f1=fopen("inp.txt","r"); //open the text file contaning program in read mode
          //   f2=fopen("pot1.txt","r");    //table files to be created are opened in write mode
    //f3=fopen("mot1.txt","r");
    f4=fopen("outputdeck.txt","w+");
    fprintf(f4,"%s\t\t\t\t\t\t%s\n","LOCATION","INSTRUCTION");
    f5=fopen("subrout.txt","r");
    cout<<"\nTHE SOURCE DECK INPUT IS:\n";
    readf(f1);
    clrscr();
    cout<<"\n The subroutine is :\n";
    readf(f5);
    clrscr();
    cout<<"\nThis program illustrates    working of absolute loader\n";
    cout<<"\n loads programs in location specified by the programmer\n";
    cout<<"\nEnter input address for caller program:\n";
     cin>>addrmain;          // cout<<addrmain;
     cout<<"\nEnter address of subroutine:\n";
     cin>>addrsub;               //cout<<addrsub;
     absolute_loader(addrmain,f1);
```

```
    absolute_loader(addrsub,f5);
  clrscr();
  cout<<"\nTHE OBJECT    DECK OUTPUT LOADED IN MEMORY IS:\n";
    readf(f4);      getch();
}
```









Input files used:

//inp.txt

```
MAIN    START
X           BALR      12 0
X           USING     MAIN+2 12
X           SR            4 4
X           L               15   ADD
X           BALR      14,15
X           END
```

```
ADD     START
 X          USING       *   15
 X          L             2   DATA1
 X          L             4   DATA2
 X          A             4   2
X           BR              14
X           END
```