Problem Definition:

This program aims at managing details of organ donors. Manually managing details would be very tough so as to keep record of new donors, old donors and the existing ones. This is very useful in real life as organ donation has become common and important. More than 100 hundred people a day are registering themselves to be a donor. More than 10% of the donors are donating their organs in a week. Donors develop poor health and can no longer donate. Hence, records should also be checked for eligibility. A person who is older than 80 years cannot donate organs. A person suffering from chronic ailments cannot donate. Such information should be updated occasionally. Not only the personal details of the donor, even the organ which is to be donated should be kept track off. When an eye donor is required, records of all the eye donors available should be viewed. After donation, the person's record should be updated, as they cannot donate the same organ more than once. Keeping track of all these and reporting statistics would be very complicate. Records should be viewed, edited and updated whenever necessary.

Problem Analysis:

This program stores information such as name, date of birth, blood group, address, phone number etc. The records can be viewed or edited. Each donor is given a donor number which is unique and is used for identification.

This program takes input only after reinforcing data validation. Program stores and updates records from file "Donors.dat".

Menu screen of the program will be:

Welcome!

Become an organ donor today.

This is a gift anyone can give. It has no cost, and it can be tremendously powerful.

Please select to continue:

- 1. To become a donor.
- 2. To update details of a donor.
- 3. To view details of a donor.
- 4. Know more about Organ donation.

5. Exit.

The input is received and the functions new_donor(), upd_donor(), view_donor(), info_donor(), exit() are called, respectively.

Function 1: new_donor()

This function is used to create a record of a new donor. It asks the user to confirm if the user isn't suffering from chronic ailments, and is not older than 80. Only if those conditions are satisfied, the programs calls the member functions, init_stat() [Initializes status with 1], init_eligi() [Initializes eligibility with 1], in_organ() [Gets input for the data members and is supported by data validation] and assign_no() [Which assigns the user a unique donor number].

It then copies the record to the file "Donors.dat"

Function 2: upd_donor()

This function first receives the unique donor number from the user. It matches the number with the records present. If match is found, it displays the name of the donor and requests the choice of detail to be updated. If a detail of the following list is to be updated, the corresponding member function is called which updates the detail.

Address	ad_upd()
City	city_upd()
Phone Number	ph_upd()
Emergency Contact Name	emer_upd()
Emergency Contact Phone number	emerno_upd()
Organ	organ_upd()
Status	status_upd()
Eligibility	eligi_upd()

If a match is not found, it displays no record found.

Function 3: view_donor()

This function displays the details of a donor according to the need of the user. It displays records of donors matching the user's requirements or the number of donors (eligible, not eligible or others). The program gets input from the user if they wish to view details of donors who match their requirements or number of donors based on conditions.

If the user chooses to view donors which match their requirement, function stat_y() is called.

Function 3.1: stat_y()

The user is asked for the details of the organ, blood group and city which they require. The file is searched and all donors matching the requirements and status=eligibility=1 will be printed. Functions ret_organ(), ret_bgroup(), ret_city() , ret_stat, ret_eligi() [Which return the respective details] are used to compare with the requirements.

If the user chooses to view numbers of donors in categories, function reports() is called.

Function 3.2: reports()

This function gives the user three options to categorize the donors(i.e., eligible, non eligible, others like blood group city and organs.) The number is calculated by reading all records in the file and printing the number of donors in that list.

Function 4: info_donor()

This function displays unknown facts about organ donation. It works like an encouragement, clearing all suspicion of donors.

Hardware Required: Printer, to print the required documents of the project. Compact Drive, Processor: Pentium III, Ram: 64 MB Hard disk: 20 GB.

Software Required: Operating system: Windows XP/7, Turbo C++, for execution of program and Ms Word, for presentation of output

Future Enhancements: This program can be further improved by addition of classes/ functions. As C++ doesn't support internet sharing, this program can be improved to make it available on the internet. Information will be available even if user doesn't have Turbo C++ downloaded. Data can be made more secure and safe by the addition of account-based programming where one can have an account and cannot access unnecessary details. Hospitals can also have an account and can have more access than a normal man.

```
Source Code:
#include<iostream.h>
#include<fstream.h>
#include<conio.h>
#include<string.h>
#include<stdio.h>
#include<stdlib.h>
#includecess.h>
#include<ctype.h>
class donor
{ long int d_no,organ;
class dob
{ public: int dd,mm,yy; }date;
char gend, name[100], address[100], city[20],b_group[3];
int phone[10];
char emer_name[100];
int emer_phno[10], status, eligibility;
public:
donor()
{ status=0; eligibility=0; }
char* ret_bgroup()
{ return b_group;}
char* ret_address()
{ return address; }
```

```
long int ret_organ()
{ return organ;}
char* ret_name()
{ return name; }
void in_organ();
void ad_upd();
void city_upd();
void ph_upd();
void emer_upd();
void emerno_upd();
void organ_upd();
void stat_upd();
void eli_upd();
void assign_no();
int ret_stat();
int ret_eligi();
long int ret_no();
void dis_organ();
char* ret_city();
void init_stat();
void init_eligi();
};
void donor:: ad_upd()
{ char a[100];
  cout<<"\n Enter new address ";</pre>
gets(a);
for( int i=0; i<strlen(a); i++)</pre>
```

```
{ if( a[i] != ' ' && ! isalnum(a[i]) )
{ cout<<"\n Sorry ";
 i=-1;
cout<<"\n Enter address again ";</pre>
gets(a);
 } }
strcpy(address,a);
cout<<"\n Updated successfully ";</pre>
}
void donor:: city_upd()
{ char a [20];
 cout<<"\n Enter city ";</pre>
     gets(a);
for(int i=0; i<strlen(a); i++)</pre>
{ if( a[i]!=' ' && !isalpha(a[i]) )
   { cout<<"\n Enter city again ";
     i=-1; gets(a);
} }
strcpy(city,a);
cout<<"\n Updated successfully ";</pre>
}
void donor ::ph_upd()
{ int no[10];
 cout<<"\n Enter phone number ";</pre>
for(int i=0; i<10; i++)
```

```
cin>>no[i];
for( i=0;i<10; i++)
{ phone[i]=no[i]; }
cout<<"\n Updated successfully ";</pre>
}
void donor:: emer_upd()
{ char a[100];
cout<<"\n Enter emergency contact name ";</pre>
gets(a);
for(int i=0;i<strlen(a); i++)</pre>
{ if(a[i]!=' ' && ! isalpha(a[i]) )
   \{ i=-1; 
   cout<<"\n Enter again ";</pre>
   gets(a);}
}
strcpy(emer_name,a);
cout<<"\n Updated successfully "; }</pre>
void donor:: emerno_upd()
{ int n[10];
cout<<"\n Enter emergency phone number ";</pre>
for(int i=0; i<10; i++)
  cin>>n[i];
for( i=0;i<10; i++)
{ emer_phno[i]=n[i]; }
cout<<"\n Updated successfully ";</pre>
```

```
}
void donor:: organ_upd()
{ long int d;
cout<<"\n 1.Eyes \n 2.Kidney \n 3.Heart \n 4.Lungs \n 5.Liver \n
6.Pancreas \n 7.All of these ";
cout<<" \n Eg. Enter 12 for eyes and kidney or Enter 1 for eyes
alone. ":
cin>>d;
organ=d; cout<<"\n Updated successfully ";</pre>
 }
void donor:: stat_upd()
{ status=0; cout<<"\n Updated ";
}
void donor::eli_upd()
{ eligibility=0; cout<<"\n Updated ";
}
void donor:: in_organ()
{
 cout<<" * cannot be edited later \n ";</pre>
 cout<<"Name*: ";</pre>
  gets(name);
  name[0]=toupper(name[0]);
for(int i=0;i<strlen(name);i++)</pre>
{ if( isalpha(name[i])==0&&isspace(name[i])==0 )
  { cout<<"\n Please enter your name again ";
```

```
i=-1; gets(name); name[0]=toupper(name[0]); } }
cout<<"\n Date of Birth*: ";</pre>
cout<<" DD.MM.YYYY ";</pre>
b :
cin>>date.dd>>date.mm>>date.yy;
if( date.dd>=1 && date.dd<=31&& date.mm>=1&&date.mm<=12&&
date.yy>1900&& date.yy<2015)
     if(
(date.mm!=1&&date.mm!=3&&date.mm!=5&&date.mm!=7
&&date.mm!=10&&date.mm!=12) && date.dd==31 )
        { cout<<"\n Enter Date of birth again ";
          goto b;}
    if( date.yy%4!=0 && date.mm==2 && date.dd>28 )
     { cout<<"\n Enter Date of birth again ";
      goto b;}
}
else {cout<<"Enter date again ";</pre>
goto b;
                                  }
cout<<"Sex*: ";
cout<<"(M or F) ";
c : cin>>gend;
if( gend!='M' && gend!='F')
 { cout<<"Enter sex again ";
goto c; }
 cout<<"Enter 10 digit phone number:" ;</pre>
```

```
for( i=0; i<10; i++)
  cin>>phone[i];
cout<<"Address: ";</pre>
gets(address);
cout<<"City: ";</pre>
gets(city);
for( i=0; i<strlen(city); i++)</pre>
{ if( isalpha(city[i]) ==0 && city[i]!=' ')
    {cout<<"Enter city again ";
       i=-1; gets(city); }}
cout<<"Blood group*: ";</pre>
 cout<<" Example: For A positive enter A+ ";
gets(b_group);
for(i=0;i<strlen(b_group); i++)</pre>
   { if( (b_group[i]!='A' && b_group[i]!='a'&& b_group[i]!='0'&&
b_group[i]!='o'&&b_group[i]!='B' &&b_group[i]!='b') &&(
b_group[i]!='+' &&b_group[i]!='-') )
       {cout<<"Enter blood group again ";
     i=-1; gets(b_group); } }
cout<<"Organs: ";</pre>
cout<<" 1. Eyes \n 2.Kidney \n 3.Heart \n 4. Lungs\n 5.Liver
\n 6.Pancreas \n 7.All of these
```

```
cout<<" \n Eq. Enter 12 for eyes and kidney. Enter 1 for eyes
alone.
cin>>organ;
cout<<"Emergency contact person \n name: ";</pre>
      gets(emer_name);
for(i=0;i<strlen(emer_name); i++)</pre>
  { if( emer_name[i]!=' ' &&isalpha(emer_name[i])==0)
    { cout<<"Please enter contact name again ";
   goto ab; } }
cout<<"Enter emergency contact \n phone number ";</pre>
  for( i=0; i<10; i++)
  cin>>emer_phno[i];
}
void donor:: assign_no()
{ ifstream a("Donors.dat",ios::binary|ios::ate);
donor e;
if(a.tellg()==0)
{ d_no=10001;}
else
{ a.seekg(a.tellg()-sizeof(e), ios::beg);
a.read((char*)&e, sizeof(e));
d_no=e.d_no+1;}
cout<<"\t \t Thank you ";</pre>
```

```
cout<<"\n Your unique donor numer is ";</pre>
cout<<d_no; }</pre>
int donor:: ret_stat()
{ return status;}
int donor::ret_eligi()
{ return eligibility; }
long int donor:: ret_no()
{ return d_no; }
void donor:: dis_organ()
{ cout<<"Donor number:"<< d_no<<"\n "<<"Name:"<<name<<"\n
"<<"Gender:"<<gend;
cout<<"\n "<<"Date of birth:"<<date.dd<<"-"<<date.mm<<"-</pre>
"<<date.yy<<" ";
cout<<"\n"<<"Blood group:"<<b_group<<"\n</pre>
"<<"Organs:"<<organ<<"\n ";
cout<<"Address:"<<address<<"\n City: ";</pre>
puts(city);
cout<<"Phone: ";</pre>
for(int i=0;i<10;i++)
cout<<phone[i];</pre>
cout<<"\n Emergency contact person: ";</pre>
cout<<"Name: "<<emer_name<<"\n"<<"Phone: ";</pre>
for(i=0;i<10;i++)
cout<<emer_phno[i]; }</pre>
char* donor ::ret_city()
```

```
{ return city; }
void donor::init_stat()
{ status=1;}
void donor:: init_eligi()
{ eligibility=1;}
void new_donor()
{
ofstream a("Donors.dat", ios::binary|ios::app);
donor b; char i1,i2;
cout<<"Are you suffering from any chronic ailments like HIV or
Cancer? Y or N ";
k: cin>>i1;
if(i1=='Y')
{
  cout<<"Sorry you cannot be a donor "; }</pre>
else if(i1=='N')
      {
         cout<<"Are you older than 80? Y or N ";</pre>
        j: cin>>i2;
          { if(i2=='Y')
             cout<<"Sorry you cannot be a donor ";</pre>
                  else if(i2=='N')
                      { b.init_stat();
```

```
b.init_eligi();
                      b.in_organ();
                      b.assign_no();
                         a.write((char*) &b, sizeof(b));}
                else{ cout<<"Invalid option. Please enter again
'';
                       goto j; } } }
else
{cout<<"Invalid option. Please enter again ";
goto k; }
a.close();
}
void upd_donor()
{ int ch,k=0;
  long int no;
donor b; int f=1;
cout<<"Please enter your unique donor number ";</pre>
cin>>no;
fstream a("Donors.dat", ios::binary|ios::out| ios::in);
while( !a.eof())
{ a.read((char *)&b, sizeof(b));
if(b.ret_no()==no)
     {f=0; cout<<b.ret_name()<<"\t ";</pre>
cout<<"\n Which of the following do you want to update? ";</pre>
while(k==0)
```

```
{ cout<<"\n 1. Address. \n 2. City \n 3. Phone number \n 4.
Emergency contact name \n 5. Emergency contact phone number \n
6.Organ \n 7.Status \n 8. Eligibilty \n ";
cin>>ch;
 switch(ch)
{ case 1: k++; b.ad_upd(); break;
case 2: k++; b.city_upd(); break;
case 3: k++; b.ph_upd(); break;
case 4: k++; b.emer_upd(); break;
case 5: k++; b.emerno_upd(); break;
case 6: k++;b.organ_upd(); break;
case 7: k++; b.stat_upd(); break;
case 8: k++; b.eli_upd(); break;
default: cout<<"Please enter choice again "; k=0;</pre>
 }}
  a.seekp(a.tellp()-sizeof(b),ios::beg);
a.write((char*)&b, sizeof(b)); break; }
}
      if(f==1)
      cout<<"No record found ";</pre>
 a.close(); }
void stat_y()
{ int ch, ch1,ch2;
char b[3], chcity[20];
ifstream d("Donors.dat", ios::binary);
donor d1;
```

```
cout<<"Please choose the requirement of organ
 cout << "\n 1.Eyes \n 2.Kidney \n 3.Heart \n 4.Lungs \n 5.Liver
\n 6.Pancreas \n 7.All of these ";
cout<<" \n Eg. Enter 12 for eyes and kidney. Enter 1 for eyes
alone. ";
cin>>ch2;
cout<<"Please enter blood group ";</pre>
v : cout<<" Example: For A positive enter A+ ";
gets(b);
for(int i=0;i<strlen(b); i++)</pre>
   { if( (b[i]!='A' && b[i]!='a'&& b[i]!='0'&& b[i]!='o'&&
b[i]!='B' &&b[i]!='b') &&( b[i]!='+' && b[i]!='-'))
       {cout<<"Enter blood group again ";
     goto v;} }
cout<<"City ";</pre>
1 : gets(chcity);
for( i=0; i<strlen(chcity); i++)</pre>
{ if( isalpha(chcity[i]) ==0 && chcity[i]!=' ')
    {cout<<"Enter city again ";
     goto 1; }}
int f=0;
while( !d.eof())
{ d.read((char*)&d1, sizeof(d1));
```

```
if(d.eof())
break;
else
{
if( d1.ret_stat()==1 && d1.ret_eligi()==1)
  { if(strcmpi(d1.ret_city(), chcity)==0 &&
(strcmpi(d1.ret_bgroup(),b)==0) \& (d1.ret_organ()==ch2||
d1.ret_organ()==7)
      {f++; cout<<"\n ";
       d1.dis_organ(); cout<<"\n "; } }}</pre>
 }
if( f==0)
{ cout<<"Sorry. No donors available ";
}
d.close(); }
void reports()
{ int ch, n, org,cto=0,ctci=0;
char cit[20];
ifstream f("Donors.dat" ,ios::binary);
donor a:
cout<<"1. Number of eligible donors "; cout<<"\n ";</pre>
cout<<"2. Number of ineligible donors "; cout<<"\n ";</pre>
cout<<"3. Categorize on other details "; cout<<"\n ";</pre>
cin>>ch;
int ct=0;
```

```
int n1=0;
switch (ch)
{ case 1: { while(!f.eof())
             { f.read((char*)&a, sizeof(a));
                if(f.eof())
               break;
            else
               { if(a.ret_eligi()==1) ct++; } }
cout<<"Number of eligible donors are "<<ct; ct=0; break;}</pre>
case 2: { while(!f.eof())
             { f.read((char*)&a, sizeof(a));
                if(f.eof())
               break;
                else
               { if(a.ret_eligi()==0) n1++; } }
cout<<"Number of ineligible donors are "<<n1; n1=0; break;}</pre>
case 3: {
cout<<"1. Blood group
cout<<"2. Organs
cout<<"3.City
cin>>n;
int a1=0, a2=0, b1=0, b2=0, o1=0, o2=0, ab1=0;
switch(n)
{ case 1: { while(!f.eof())
             { f.read((char*)&a, sizeof(a));
                if(f.eof())
```

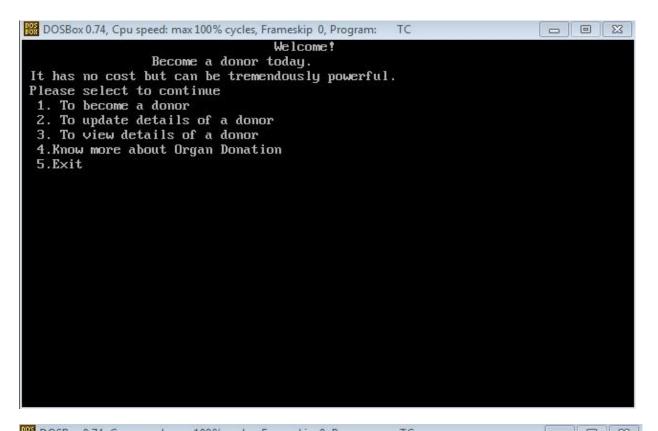
```
break;
            else
                { if(strcmpi(a.ret_bgroup(),"a+")==0)
                      a1++;
           else if(strcmpi(a.ret_bgroup(),"a-")==0)
              a2++;
else if (strcmpi(a.ret_bgroup(),"b+")==0)
   b1++;
else if(strcmpi(a.ret_bgroup(),"b-")==0)
b2++;
else if(strcmpi(a.ret_bgroup(),"o+")==0)
01++;
else if(strcmpi(a.ret_bgroup(),"o-")==0)
02++;
else if(strcmpi(a.ret_bgroup(),"ab+")==0)
ab1++;} }
cout<<" Number of \n ";
cout << "A+" << a1 << " \ A-" << a2 << " \ B+" << b1 << " \ B-" << b2 << " \ N
0+"<<01<<"\n 0-"<<02<<" \n AB+"<<ab1; break; }
case 2: { cout<<"Enter your organ choice "; cin>>org;
         while(!f.eof())
             { f.read((char*)&a, sizeof(a));
                if(f.eof())
               break;
            else
                { if(a.ret_organ()==org) cto++; } }
cout<<"Number of donors are"<<cto; break;}</pre>
case 3: { cout<<"Enter city "; cin>>cit;
```

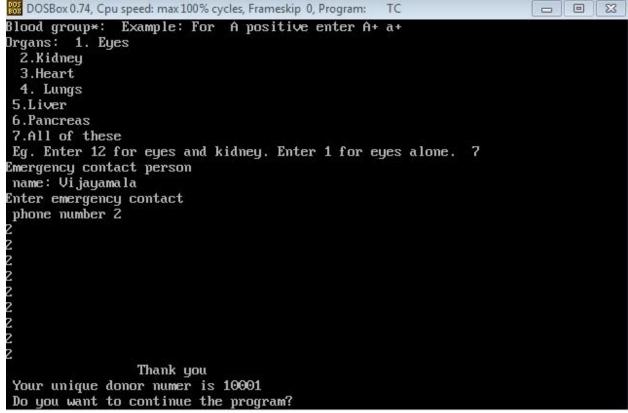
```
while(!f.eof())
             { f.read((char*)&a, sizeof(a));
                 if(f.eof())
                break;
            else
                { if(strcmpi(a.ret_city(),cit)==0) ctci++; } }
cout<<"Number of donors"<<ctci;</pre>
break;} }f.close();
}}}
void view_donor()
{ int n;
cout<<"Please choose ";</pre>
x : cout<<" \n 1. Status Y donors \n 2. Reports \n ";
cin>>n;
if( n==1 )
 { stat_y(); }
else if(n==2)
{ reports();}
else goto x; }
void info_donor()
{
cout<<"\n ";</pre>
cout<<"Did you know? ";</pre>
cout<<"\n ";
cout<<"1.Organs are matched by blood and tissue typing, ";</pre>
cout<<"organ size, medical urgency, waiting time and
geographic location. ";
```

```
cout<<"\n \n ";
cout<<"2.Organs and tissues that can be donated include: ";
cout<<"heart, kidneys, lungs, pancreas, liver, intestines, ";</pre>
cout<<" corneas, skin, tendons, bone, and heart valves. ";
cout<<"\n
          \n ";
cout<<"3. There is no cost to the donor family or estate for
organ ";
 cout<<"and tissue donation. ":</pre>
cout<<"\n \n ";
cout<<"4.If you are sick or injured and admitted to the hospital
cout<<" the number one
                              priority is to save your life. ";
cout<<" Organ donation can only be considered after brain
death ";
cout<<" has been declared by a physician. ";
cout<<"\n \n ";
cout<<"5.Information about an organ donor is only released to
the recipient ";
cout<<" if the family of the donor requests or agrees to it.
cout<<" Otherwise, a patient privacy is
                                               maintained for
both donor families and recipients. ";
cout<<"\n \n ";
cout<<"6.Living donation increases the existing organ supply. ";
cout<<"\n \n ";
cout<<"7.Donors are needed for all races and ethnic groups. ";
cout<<"Transplant success rates increase when organs are matched
cout<<" between members of the same ethnic background. ";</pre>
cout<<"\n \n ";
```

```
cout<<"You are not a donor yet? GO register now. ";</pre>
cout<<"\n \n "; }</pre>
void main()
{ randomize();
clrscr();
  int ch;
 char rep='y';
cout << "\t \t \t \t ";
cout<<"Welcome! ";</pre>
cout<<"\n \t \t ";
cout<<"Become a donor today. ";</pre>
cout<<"\n ";</pre>
cout<<"It has no cost but can be tremendously powerful. ";</pre>
while(rep=='y')
{cout<<"\n ";
cout<<"Please select to continue ":</pre>
cout<<"\n ";</pre>
cout<<" 1. To become a donor ";</pre>
cout<<"\n ";</pre>
cout<<" 2. To update details of a donor ";
cout<<"\n ";
cout<<" 3. To view details of a donor ";</pre>
cout<<"\n ";</pre>
cout<<" 4.Know more about Organ Donation ";</pre>
cout<<"\n ";
cout<<" 5.Exit \n ";</pre>
```

```
cin>>ch;
switch(ch)
{ case 1: new_donor(); break;
case 2: upd_donor(); break;
case 3: view_donor(); break;
case 4: info_donor(); break;
case 5: exit(0);
default: cout<<"Sorry Invalid option ";
}
cout<<" \n Do you want to continue the program? ";
cin>>rep; }
}
```





```
- E X
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program:
Blood group*: Example: For A positive enter A+ b+
Organs: 1. Eyes
 2. Kidney
  3.Heart
 4. Lungs
 5.Liver
6.Pancreas
7.All of these
Eg. Enter 12 for eyes and kidney. Enter 1 for eyes alone. 1
Emergency contact person
name: Asaikannu
Enter emergency contact
phone number 3
999999
                 Thank you
 Your unique donor numer is 10002
Do you want to continue the program?
DOSBox 0.74, Cpu speed: max 100% cycles, Frameskip 0, Program: TC
                                                                      - P X
Please enter your unique donor number 10001
Sriranjini
Which of the following do you want to update?

    Address.

2. City
3. Phone number
4. Emergency contact name
5. Emergency contact phone number
6.Organ
7.Status
8. Eligibilty
1.Eyes
2. Kidney
3.Heart
4. Lungs
5.Liver
6.Pancreas
7.All of these
Eg. Enter 12 for eyes and kidney or Enter 1 for eyes alone. 7
Updated successfully
Do you want to continue the program?
```

