

```

#include<iostream>

using namespace std;

void insert_withoutreplacement(int n)
{
    int arr1[n-1];
    int arr2[n-1];
    int flag[n-1];
    for(int i=0;i<n;i++)
    {
        flag[i]=0;
    }
    cout<<"Enter the elements "<<"\n";
    for(int i=0;i<n;i++)
    {
        cin>>arr1[i];
    }
    for (int i=0;i<n;i++)
    {
        arr2[i]=-1;
    }
    //actual code
    for(int i=0;i<n;i++)
    {
        int a=arr1[i]%n;
        if(arr2[a]==-1)
        {
            arr2[a]=arr1[i];
            flag[a]=1;
        }
        else
        {

```

```
int c=a+1;
int flag1=0;
while(c!=a && flag1==0)
{
    if(flag[c]==0 && c<n)
    {
        arr2[c]=arr1[i];
        flag[c]=1;flag1=1;
        break;
    }

    else
    {
        if(c==n)
        {
            c=-1;
        }
        c++;
    }
}

cout<<" Hashing table is ";
cout<<"\n";
for(int j=0;j<n;j++)
{
    cout<<arr2[j]<<" ";
}
}
```

```

void insert_replacement(int n)
{
    int arr1[n-1];
    int arr2[n-1];
    int flag[n-1];
    for(int i=0;i<n;i++)
    {
        flag[i]=0;
    }
    cout<<"Enter the elements "<<"\n";
    for(int i=0;i<n;i++)
    {
        cin>>arr1[i];
    }
    for (int i=0;i<n;i++)
    {
        arr2[i]=-1;
    }
    for(int i=0;i<n;i++)
    {
        int a=arr1[i]%n;
        if(arr2[a]==-1)
        {
            arr2[a]=arr1[i];
            flag[a]=1;
        }
        else
        {
            int c=a+1;
            int flag1=0;
            while(c!=a && flag1==0)

```

```
{  
if(flag[c]==0 && c<n)  
{  
arr2[c]=arr1[i];  
flag[c]=1;flag1=1;  
//swapping  
int temp;  
temp=arr2[a];  
arr2[a]=arr2[c];  
arr2[c]=temp;  
c++;  
break;
```

```
}  
else  
{  
if(c==n)  
{  
c=-1;  
}  
c++;  
}  
}  
}
```

```
}
```

```
cout<<" Hashing table is ";  
cout<<"\n";  
for(int j=0;j<n;j++)
```

```

{
    cout<<arr2[j]<<" ";
}
}

void insert_student(int n)
{
    int arr1[n-1];
    int arr2[n-1];
    int flag[n-1];
    for(int i=0;i<n;i++)
    {
        flag[i]=0;
    }
    cout<<"Enter the rollno of students "<<"\n";
    for(int i=0;i<n;i++)
    {
        cin>>arr1[i];
    }
    for (int i=0;i<n;i++)
    {
        arr2[i]=-1;
    }
    //actual code
    for(int i=0;i<n;i++)
    {
        int a=arr1[i]%n;
        if(arr2[a]==-1)
        {
            arr2[a]=arr1[i];
            flag[a]=1;
        }
    }
}

```

```
else
{
int c=a+1;
int flag1=0;
while(c!=a && flag1==0)
{
if(flag[c]==0 && c<n)
{
arr2[c]=arr1[i];
flag[c]=1;flag1=1;
break;
}
```

```
else
{
if(c==n)
{
c=-1;
}
c++;
}
}
}
```

```
}
```

```
cout<<" Roll No. Of students are ";
cout<<"\n";
for(int j=0;j<n;j++)
{
cout<<arr2[j]<<" ";
```

```

    }
}
int main()
{
    int choice=1,ch;
    do
    {
        cout<<" Hashing "<<"\n";
        cout<<"1.Linear probing without replacement"<<"\n";
        cout<<"2.Linear probing with replacement"<<"\n";
        cout<<"3.Hash Table to store the rollno of students "<<"\n";
        cout<<"Enter your choice";
        cin>>ch;

        switch(ch)
        {
            case 1:
                int n1;
                cout<<"Enter the max length of hashing table: ";
                cin>>n1;
                insert_withoutreplacement(n1);
                break;
            case 2:
                int n2;
                cout<<"Enter the max length of hashing table: ";
                cin>>n2;
                insert_replacement(n2);
                break;
            case 3:
                int n3;
                cout<<"Enter the total no. of students in the class: "<<"\n";

```

```
cin>>n3;
insert_student(n3);
break;
}
cout<<"Press 1 to continue"<<"\n";
cin>>choice;
}while(choice==1);
return 0;
}
```