

Practical 1(b): Program to determine uniquely decodable codes.

```
#include<iostream>
#include<vector>
using namespace std;
vector<string> v;
void printlist()
{
    cout<<"List : ";
    for(int k=0;k<v.size();k++)
        cout<<v[k]<<" ";
    cout<<endl<<endl;
}
void checkthis(string temp,int len)    //temp = latest added string len=n
{
    for(int i=0;i<len;i++)
    {
        int upto=v[i].size();
        if(v[i].size() < temp.length() && v[i]==temp.substr(0,upto))
        {
            string test=temp.substr(upto);
            v.push_back(test);
            cout<<"Added "<<test<<" in the list because element "<<i+1<<
            " is prefix of element "<<v.size()-1<<endl;
            printlist();
            checkthis(test,len);
        }
    }
}

int main()
{
    int len,decodable=true,lastindex;
    cout<<"How many codes you want to enter : ";cin>>len;
```

```

for(int i=0;i<len;i++)
{
    string temp;
    cout<<i+1<<" :";cin>>temp;
    v.push_back(temp);
}
printlist();
for(int i=0;i<v.size();i++)
{
    for(int j=0;j<v.size();j++)
    {
        if(i!=j)
        {
            if(v[i]==v[j] && (i<len || j<len) )
            {
                cout<<"Element "<<i+1<<" and "<<j+1<<" is matching so
                it can not be UDC.";
                decodable=false;
                break;
            }
            else if( v[i].size() < v[j].size() &&
v[i]==v[j].substr(0,v[i].size()) && (i<len || j<len) &&
j!=lastindex)
            {
                string temp;
                temp=v[j].substr(v[i].size(),v[j].size());
                lastindex=j;
                cout<<"Added "<<temp<<" in the list because element
                "<<i+1<<" is prefix of element "<<j+1<<endl;
                v.push_back(temp);
                printlist();
                checkthis(temp,len);
            }
        }
    }
    if(decodable==false)
    break;}

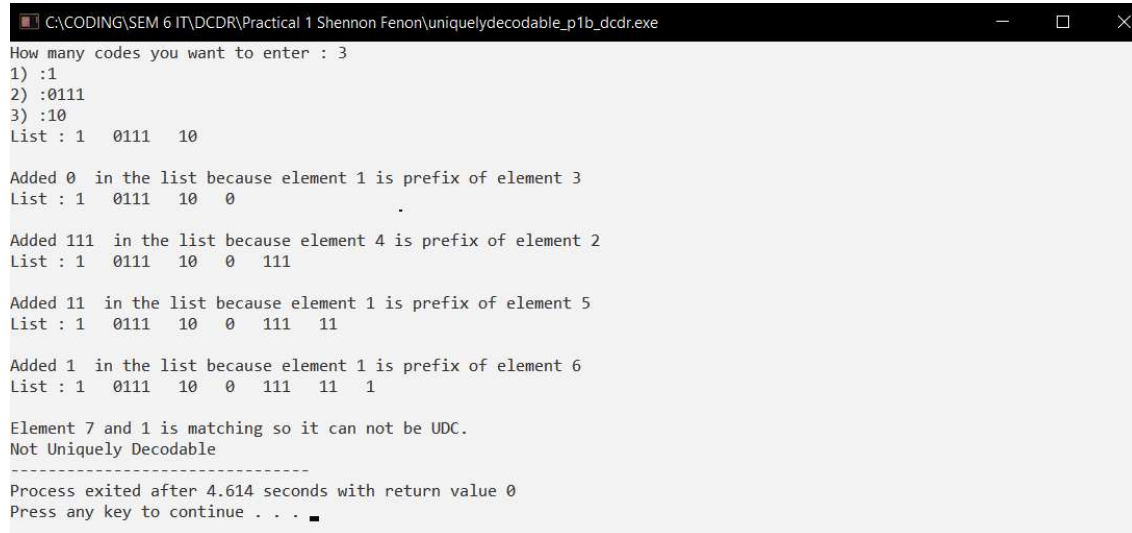
```

```

    if(decodable)
        cout<<endl<<"Uniquely Decodable";
    else
        cout<<endl<<"Not Uniquely Decodable";
}

```

OUTPUT:



```

C:\CODING\SEM 6 IT\DCDR\Practical 1 Shannon Fenon\uniquelydecodable_p1b_dcdr.exe
How many codes you want to enter : 3
1) :1
2) :0111
3) :10
List : 1  0111  10

Added 0  in the list because element 1 is prefix of element 3
List : 1  0111  10  0

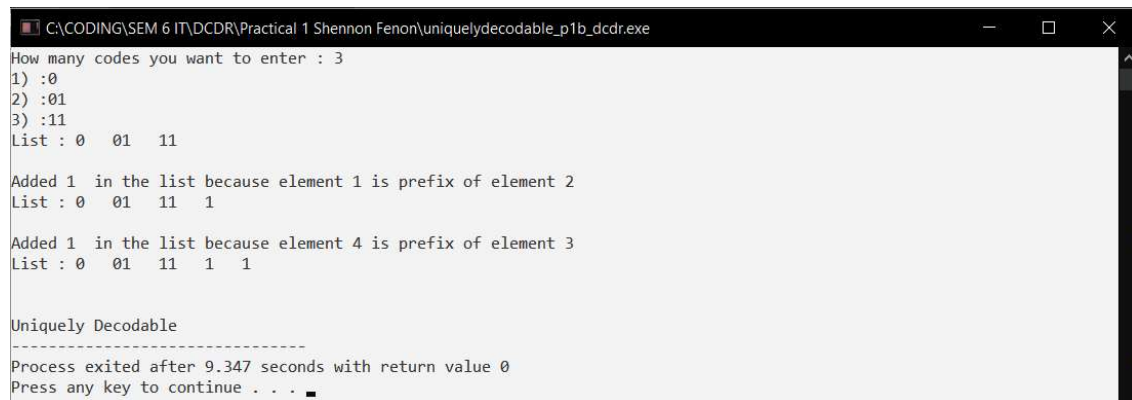
Added 111 in the list because element 4 is prefix of element 2
List : 1  0111  10  0  111

Added 11  in the list because element 1 is prefix of element 5
List : 1  0111  10  0  111  11

Added 1   in the list because element 1 is prefix of element 6
List : 1  0111  10  0  111  11  1

Element 7 and 1 is matching so it can not be UDC.
Not Uniquely Decodable
-----
Process exited after 4.614 seconds with return value 0
Press any key to continue . . .

```



```

C:\CODING\SEM 6 IT\DCDR\Practical 1 Shannon Fenon\uniquelydecodable_p1b_dcdr.exe
How many codes you want to enter : 3
1) :0
2) :01
3) :11
List : 0  01  11

Added 1  in the list because element 1 is prefix of element 2
List : 0  01  11  1

Added 1  in the list because element 4 is prefix of element 3
List : 0  01  11  1  1

Uniquely Decodable
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Process exited after 9.347 seconds with return value 0
Press any key to continue . . .

```