# Advances in Data Structure
# Course Project
# SY C

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<u>Problem Statement</u>: Phone Directory using Tries

```cpp
#include<iostream>
#include<cstdlib>
using namespace std;

struct Trie
{
   struct Trie * children[10];
   bool end;
   string name;
   string email;
};

Trie *root=NULL;

Trie* createNode()
{
   Trie * x = new Trie();
   for(int i=0;i<10;i++)
   {
      x->children[i]=NULL;
   }
   x->end=false;
   return x;
}

bool check(string s)
{
```

```cpp
if(root==NULL)
{
    cout<<"\tcontact not found , database empty\n ";
    return false;
}


Trie * curr=root;
for(int i=0;i<s.length();i++)
{
    int val = s[i]-'0';
    if(curr->children[val]==NULL)
    {
        cout<<"\tcontact not found\n ";
        return false;
    }
    curr= curr->children[val];
    //cout<<"1"<<endl;
}
if(curr!=NULL && curr->end == true)
{
    cout<<" "<<curr->name<<endl;
    cout<<" "<<curr->email<<endl;
    return true;
}
else
{
    cout<<"\tcontact not found\n ";
    return false;
```

```cpp
        }
    }

    void insert(string s,string nam,string emal)
    {
        if(root==NULL)
        {
            root= createNode();
        }


        Trie * curr = root;
        for(int i=0;i<s.length();i++)
        {
            int val = s[i] - '0';
            if(curr->children[val]==NULL)
            {
                curr->children[val] = createNode();
            }
        //cout<<"2\n";
        curr=curr->children[val];
        }
        curr->end=true;
        curr->name = nam;
        curr->email = emal;
    }

    void update(string s,string nam,string emal)
    {
```

```cpp
        if(root==NULL)
        {
            cout<<"\tcontact number not found\n";
            return;
        }


        Trie * curr = root;
        for(int i=0;i<s.length();i++)
        {
            int val = s[i] - '0';
            if(curr->children[val]==NULL)
            {
                cout<<"\tcontact number not found\n ";
                return;              //curr->children[val] = createNode();
            }
            //cout<<"2\n";
            curr=curr->children[val];
        }


        curr->end=true;
        curr->name = nam;
        curr->email=emal;
}


int main()
{
    string s;
    string name;
```

```cpp
    string email;
    int ch;
    while(1)
    {
        cout<<"\tEnter your choice\n\t1]add contact\n\t2]search
contact\n\t3]update\n\t4]exit\n ";
        cin>>ch;
        switch(ch)
        {
            case 1:
                cout<<"\tEnter mobile number\n ";
                cin>>s;
                cout<<"\tEnter name\n ";
                cin>>name;
                cout<<"\tEnter email\n ";
                cin>>email;
                insert(s,name,email);
                cout<<endl;
                break;

            case 2:
                cout<<"\tEnter mobile number\n ";
                cin>>s;
                check(s);
                cout<<endl;
                break;

            case 3:
```

```cpp
                cout<<"\tEnter mobile number, which is to be updated\n ";
                cin>>s;
                cout<<"\tEnter updated name\n ";
                cin>>name;
                cout<<"\tEnter updated email\n ";
                cin>>email;
                update(s,name,email);
                cout<<endl;
                break;


            case 4:
                exit(0);
        }
    }
    return 0;
}
```

OUTPUT:

```
C:\Users\Gargi\Documents\AiDS_course_project_tries.exe

        Enter your choice
        1]add contact
        2]search contact
        3]update
        4]exit
1
        Enter mobile number
9922416206
        Enter name
Sagarica
        Enter email
saga@roma.com

        Enter your choice
        1]add contact
        2]search contact
        3]update
        4]exit
1
        Enter mobile number
9156092416
        Enter name
Darshan
        Enter email
dar@gmail.com

        Enter your choice
        1]add contact
        2]search contact
        3]update
```

C:\Users\Gargi\Documents\AiDS_course_project_tries.exe

```
        4]exit
1
        Enter mobile number
9890454507
        Enter name
Neha
        Enter email
neha@vit.edu

        Enter your choice
        1]add contact
        2]search contact
        3]update
        4]exit
2
        Enter mobile number
9890454507
Neha
neha@vit.edu

        Enter your choice
        1]add contact
        2]search contact
        3]update
        4]exit
3
        Enter mobile number, which is to be updated
9890454507
        Enter updated name
Nehaaaaaaaa
```

C:\Users\Gargi\Documents\AiDS_course_project_tries.exe

```
        Enter updates email
nia@vit.edu

        Enter your choice
        1]add contact
        2]search contact
        3]update
        4]exit
```