

# Australian Voting

## Program:

```
#include <bits/stdc++.h>
using namespace std;

struct Candidate
{
    string Name;
    int Votes;
    bool Eleminated;
};

Candidate Cands[21];
int Ballots[1000][1001];
void initVotes()
{
    for (int i=1; i<=20; i++) Cands[i].Votes = 0;
}

void initeleminated()
{
    for (int i=1; i<=20; i++) Cands[i].Eleminated = false;
}

int checkAbove50(int nVoters, int nCandidates)
{
    for (int i=1; i<= nCandidates; i++) if ((double)Cands[i].Votes > nVoters/2.0)
        return i;
    return -1;
}

void countVotes(int nVoters)
{
    for (int i=0; i<nVoters; i++)
        for (int j=0; j<3; j++)
            if (!Cands[Ballots[i][j]].Eleminated)
                {Cands[Ballots[i][j]].Votes++; break;}
}

bool eliminate(int nCandidates)
{
    int Highest=-1, Lowest=10000;
```

```

        for (int i=1; i<=nCandidates; i++)
        {
            if (Cands[i].Votes > Highest && !Cands[i].Eleminated) Highest = Cands[i].
Votes;
            if (Cands[i].Votes < Lowest && !Cands[i].Eleminated) Lowest = Cands[i].V
otes;
        }

        if (Lowest == Highest) return false;

        for (int i=1; i<=nCandidates; i++) if (Cands[i].Votes == Lowest) Cands[i].Ele
minated = true;

        return true;
    }
int main()
{

    int N;

    cin >> N;
    cin.get();
    cin.get();
    int nCandidates;

    for (int f=0; f<N; f++)
    {
        cin >> nCandidates;
        cin.get();

        for (int i=1; i<=nCandidates; i++) getline(cin,Cands[i].Name);

        initeleminated();
        int nVoters=0;
        for (nVoters=0;nVoters <1000; nVoters++)
        {
            char input;
            input = cin.get();
            if (input == '\n') break;
            cin.putback(input);

            for (int i=0; i<nCandidates; i++)
                cin >> Ballots[nVoters][i];
        }
    }
}

```

```

        cin.get();
    }
    int winner = -1;
    do
    {
        initVotes();
        countVotes(nVoters);
        winner = checkAbove50(nVoters,nCandidates);
        if (winner != -1) break;
    }
    while(eleminate(nCandidates));

    if (winner == -1)
    {   for (int i=1; i<=nCandidates; i++)
        if (!Cands[i].Eleminated) cout << Cands[i].Name << endl;
    }
    else cout << Cands[winner].Name << endl;
    if (f < N-1) cout << endl;
}

return 0;
}

```

## Output:

```

1
3
John Doe
Jane Smith
Jane Austen
1 2 3
2 1 3
2 3 1
1 2 3
3 1 2

John Doe

```