

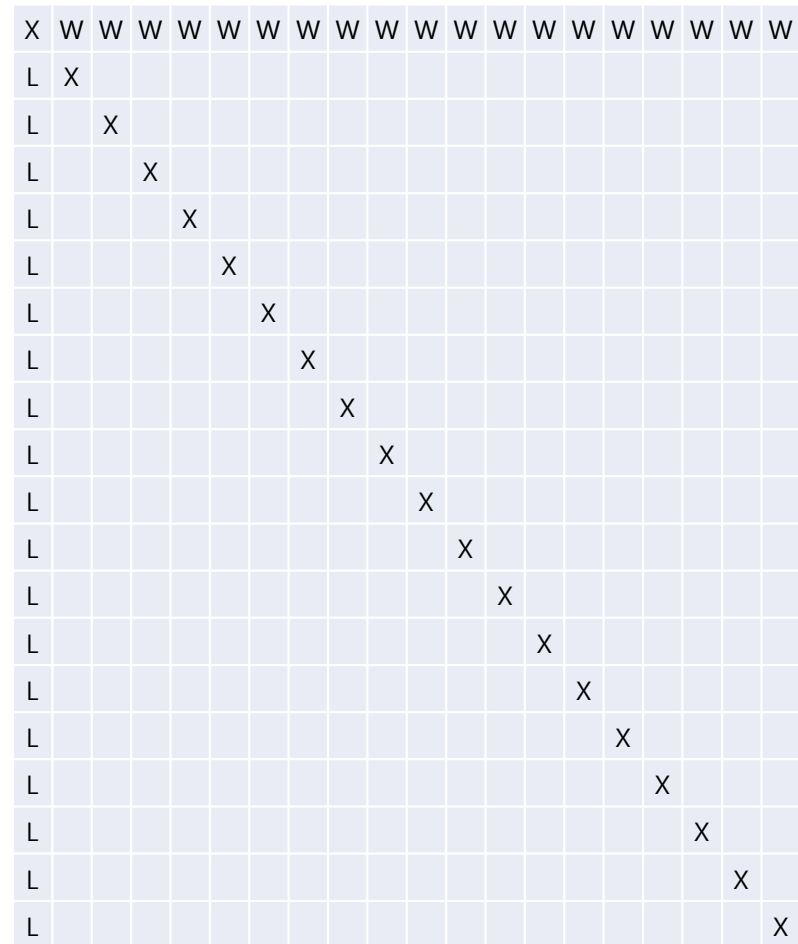
Homework 2B

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Problem explanation

- Points for soccer teams
- A soccer league has 20 teams, and each team plays 19 games, once with all other teams. Each team gets
- A points when it wins, represented by "W" (win),
- B points when it ties, represented by "T" (tie), and
- 0 points when it is defeated, represented by "L" (lose),
- where A and B are integers satisfying $0 < B < A < 10$.
- For given A and B, we want to know all the game results that yield the maximum OR minimum points (D) of a team with the Cth largest scores.
- A and B: $0 < B < A < 10$ (integer)
- C: target ranking (1~20, integer)
- D: 0 (minimum) or 1 (maximum)



[illegible]

Solution explanation

Let consider with $D=1$ first

If $C=2$, then I should make 2nd team who got win as much as they can.

And it can't be 19*Win. If some team don't lose, then the other team have to got at least 1 Lose.

So I decide to make $18 * \text{Win} + 1 * \text{Tie}$

At the first largest team and second largest team as well.

And I'm only considering 2st largest scores,
so I don't need to consider the other teams.

Therefore, I'm going to full with T to the other position.

[illegible]

Solution explanation

Let consider with $D=1$ first

If $C=3$, then I should make 3rd team who got win as much as they can.

And it can't be 19*Win. If some team don't lose, then the other team have to got at least 2 Lose.

So I decide to make $17 \cdot \text{Win} + 2 \cdot \text{Tie}$

At the first largest team and second largest team as well.

And I'm only considering 3rd largest scores,
so I don't need to consider the other teams.

Therefore, I'm going to full with T to the other position.

[illegible]

Solution explanation

So, if $C=k$, I can decide k th record as $(19-k+1)*Win+(k-1)*Tie$.

And these record should be same from largest team to kth largest team.

So, I can make it like right matrix.

[illegible]

Solution explanation

When $D=0$, solution is similar.

If I change W to L, that's it.

So, if $C=k$, I can decide k th record as

$$(19-k+1)*\text{Lose}+(k-1)*\text{Tie}.$$

And these record should be same from smallest team to kth smallest team.

So, I can make it like right matrix.

[illegible]

Solution explanation

This is main code.

```
int main(){
    char Matrix[20][20];
    int Score[20];
    int A,B,C,D;
    for(int i=0; i<20; i++) Score[i]=0;
    scanf("%d %d %d %d",&A, &B, &C, &D);
    if(D==1){
        for(int i=0; i<C;i++){
            for(int j=0;j<20;j++){
                if(i==j) Matrix[i][j]='X';
                else if(j<C) Matrix[i][j]='T';
                else Matrix[i][j]='W';
            }
        }
        for(int i=C; i<20;i++){
            for(int j=0;j<20;j++){
                if(i==j) Matrix[i][j]='X';
                else if(j<C) Matrix[i][j]='L';
                else Matrix[i][j]='T';
            }
        }
    }
    else if(D==0){
        for(int i=0; i<C;i++){
            for(int j=0;j<20;j++){
                if(i==j) Matrix[i][j]='X';
                else if(j<C) Matrix[i][j]='T';
                else Matrix[i][j]='L';
            }
        }
        for(int i=C; i<20;i++){
            for(int j=0;j<20;j++){
                if(i==j) Matrix[i][j]='X';
                else if(j<C) Matrix[i][j]='W';
                else Matrix[i][j]='T';
            }
        }
    }
}
```