八皇后问题. Eight Queens

Turnpike Reconstruction Problem

Given $n(n-1)/2$ distances, reconstruct a point set.

Given $D = \{1, 2, 2, 2, 3, 3, 3, 4, 5, 5, 5, 6, 7, 8, 10\}$.

① $n(n-1)/2 = 15$, $n = 6$.

② $x_1 = 0$, $x_6 = 10$.

③ find the next largest distance and check.

```
bool Reconstruct ( DistType X[ ], DistSet D, int N, int left, int right )
{ /* X[1]...X[left-1] and X[right+1]...X[N] are solved */
    bool Found = false;
    if ( Is_Empty( D ) )
        return true; /* solved */
    D_max = Find_Max( D );
    /* option 1: X[right] = D_max */
    /* check if |D_max-X[i]|∈D is true for all X[i]'s that have been solved */
    OK = Check( D_max, N, left, right ); /* pruning */
    if ( OK ) { /* add X[right] and update D */
        X[right] = D_max;
        for ( i=1; i<left; i++ )  Delete( |X[right]-X[i]|, D);
        for ( i=right+1; i<=N; i++ )  Delete( |X[right]-X[i]|, D);
        Found = Reconstruct ( X, D, N, left, right-1 );
        if ( !Found ) { /* if does not work, undo */
            for ( i=1; i<left; i++ )  Insert( |X[right]-X[i]|, D);
            for ( i=right+1; i<=N; i++ )  Insert( |X[right]-X[i]|, D);
        }
    }
    /* finish checking option 1 */
    if ( !Found ) { /* if option 1 does not work */
        /* option 2: X[left] = X[N]-D_max */
        OK = Check( X[N]-D_max, N, left, right );
        if ( OK ) {
            X[left] = X[N] - D_max;
            for ( i=1; i<left; i++ )  Delete( |X[left]-X[i]|, D);
            for ( i=right+1; i<=N; i++ )  Delete( |X[left]-X[i]|, D);
            Found = Reconstruct (X, D, N, left+1, right );
            if ( !Found ) {
                for ( i=1; i<left; i++ ) Insert( |X[left]-X[i]|, D);
                for ( i=right+1; i<=N; i++ ) Insert( |X[left]-X[i]|, D);
            }
        }
        /* finish checking option 2 */
    } /* finish checking all the options */

    return Found;
}
```

∴从最大开始取 (max-x[i] 就是最小)

∴最大、小两端已处理好.

如何找一个点 8 (next largest).

$x_5 = 8$.

现已有 x_1、x_6.

找 $|x_5 - x_1|$、$|x_5 - x_6|$ 在不在 D 中

在 in 活在 D 中删掉.

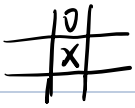
不在 in 活 false 返回.

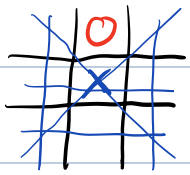
Tic-tac-toe.

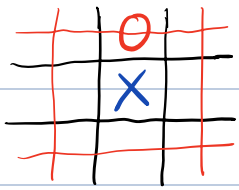
goodness of a position : $f(P) = W_{computer} - W_{Human}$.

W：在当前状况下可能可以实现三连接方式.

X computer. O human.



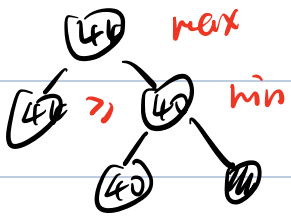
$W_{computer}$:  b

W_{Human}: 

Human 想要 minimize, Alpha-Go 想要 maximize.

α-β pruning α-β 剪枝.

对抗搜索，就是让不能一直往同一个方向.

α pruning 

β pruning