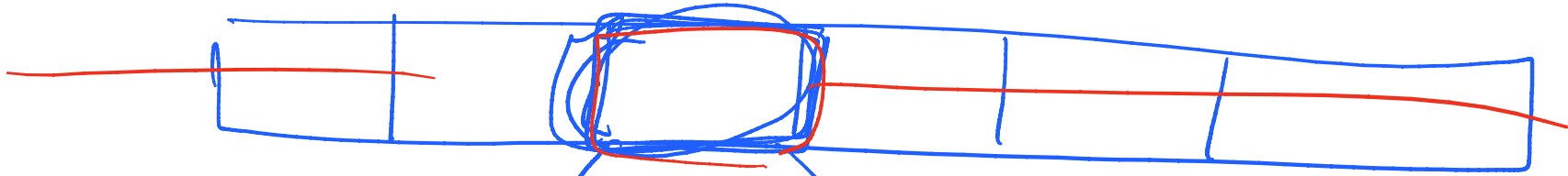


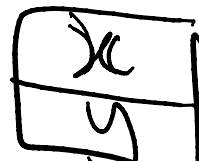
allStudents [i] = {



allStudents [i].
letterGrade [c]



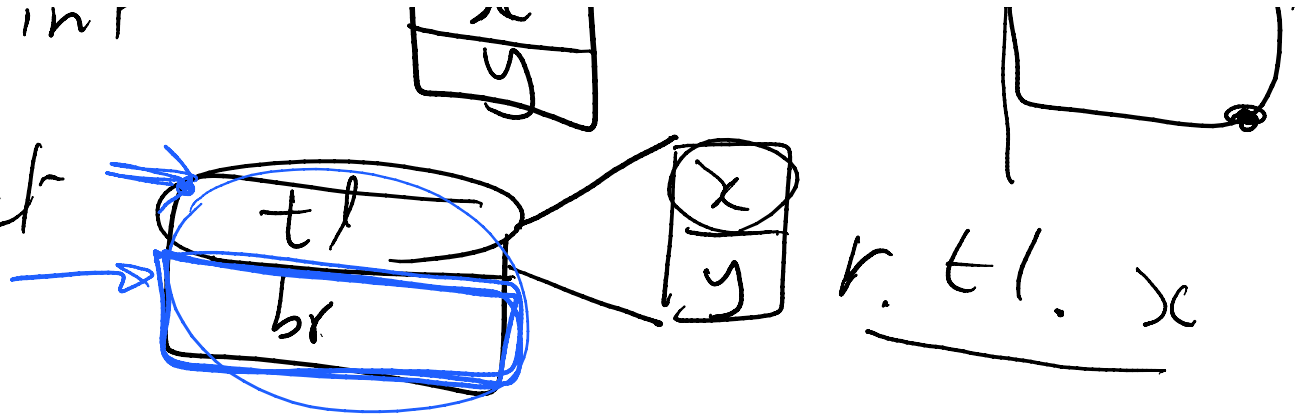
Struct Point



struct Point

struct Rect

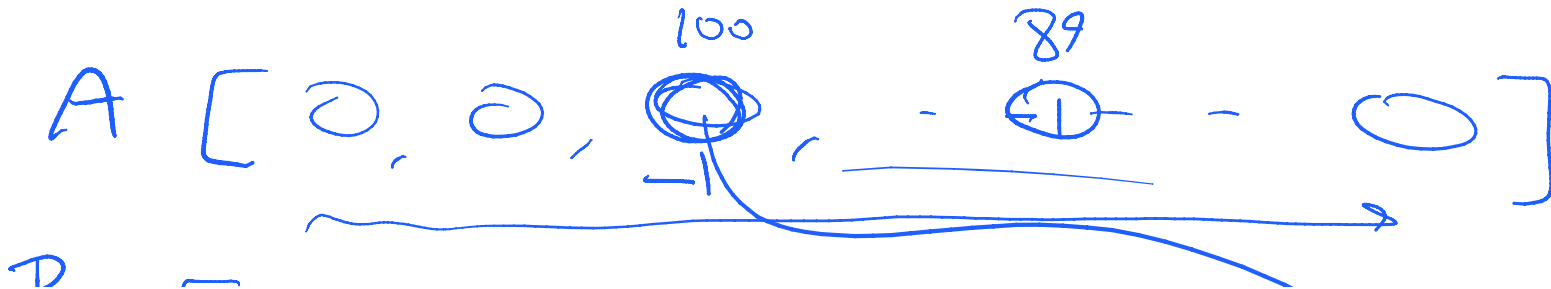
Rect r;

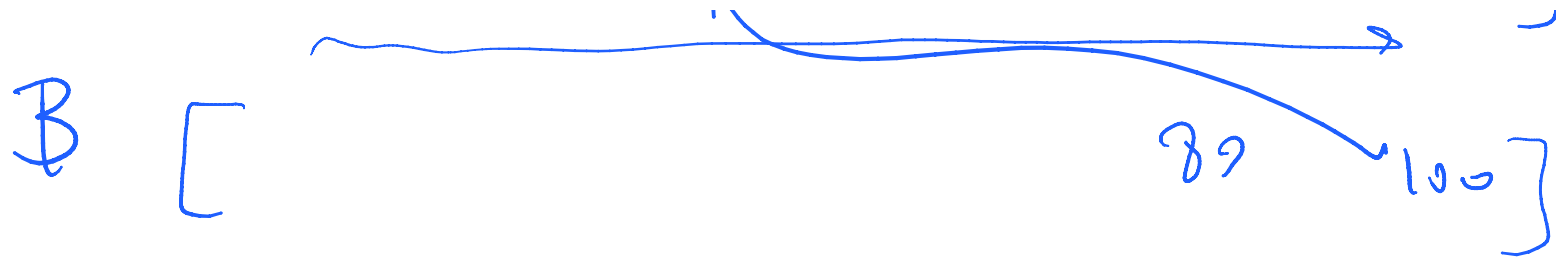


```

struct Rect {
    int top;
    int bottom;
    left;
    right;
}

```





N passes

↳ each pass N items

$$N^2$$

[10 15 8 20 92 3]

[10 15 8 20 3 92]

[10 15 8 3 20 92]

2-92

↳ loss

↙

$$\left[\begin{array}{ccc|ccc} 10 & 3 & 8 & 15 & 20 & 92 \end{array} \right]$$

$$\left[\begin{array}{ccc|ccc} 8 & 3 & 10 & 15 & 20 & 92 \end{array} \right]$$

$$\left[\begin{array}{ccc|ccc} 3 & 8 & 10 & 15 & 20 & 92 \end{array} \right]$$

↘

$$\begin{aligned} & \textcircled{(N-1)} + (N-2) + (N-3) + \dots + 3 + 2 + 1 \\ & \frac{(N-1)(N-2)}{2} = \frac{1}{2} N^2 - \frac{N}{2} \end{aligned}$$