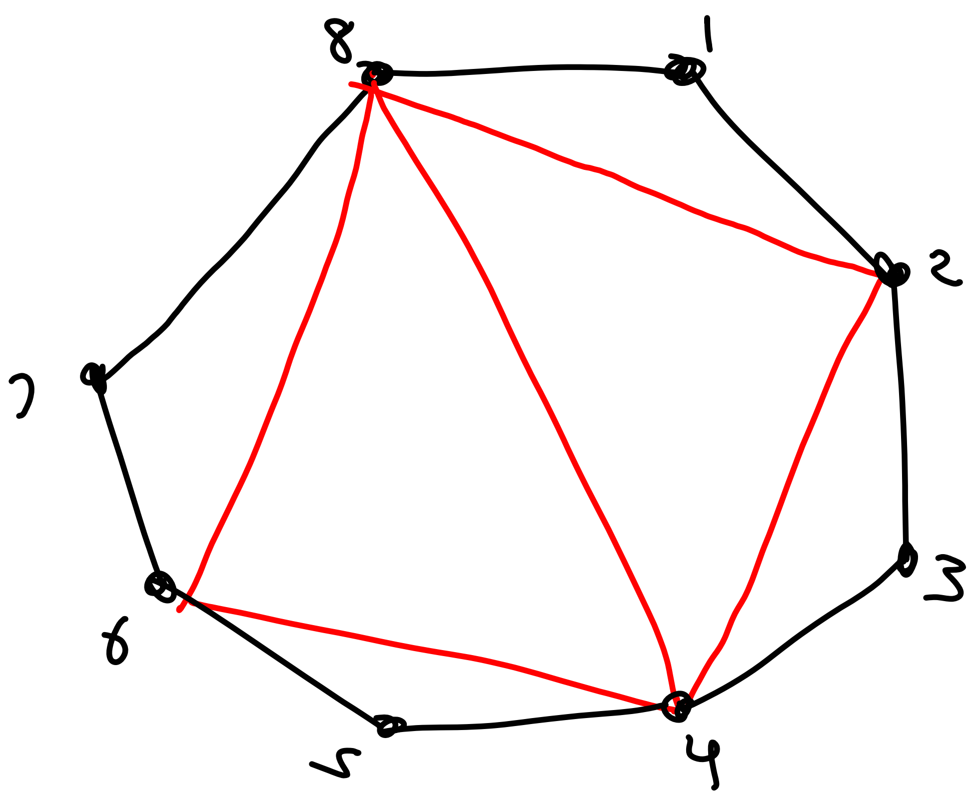
9\4\09

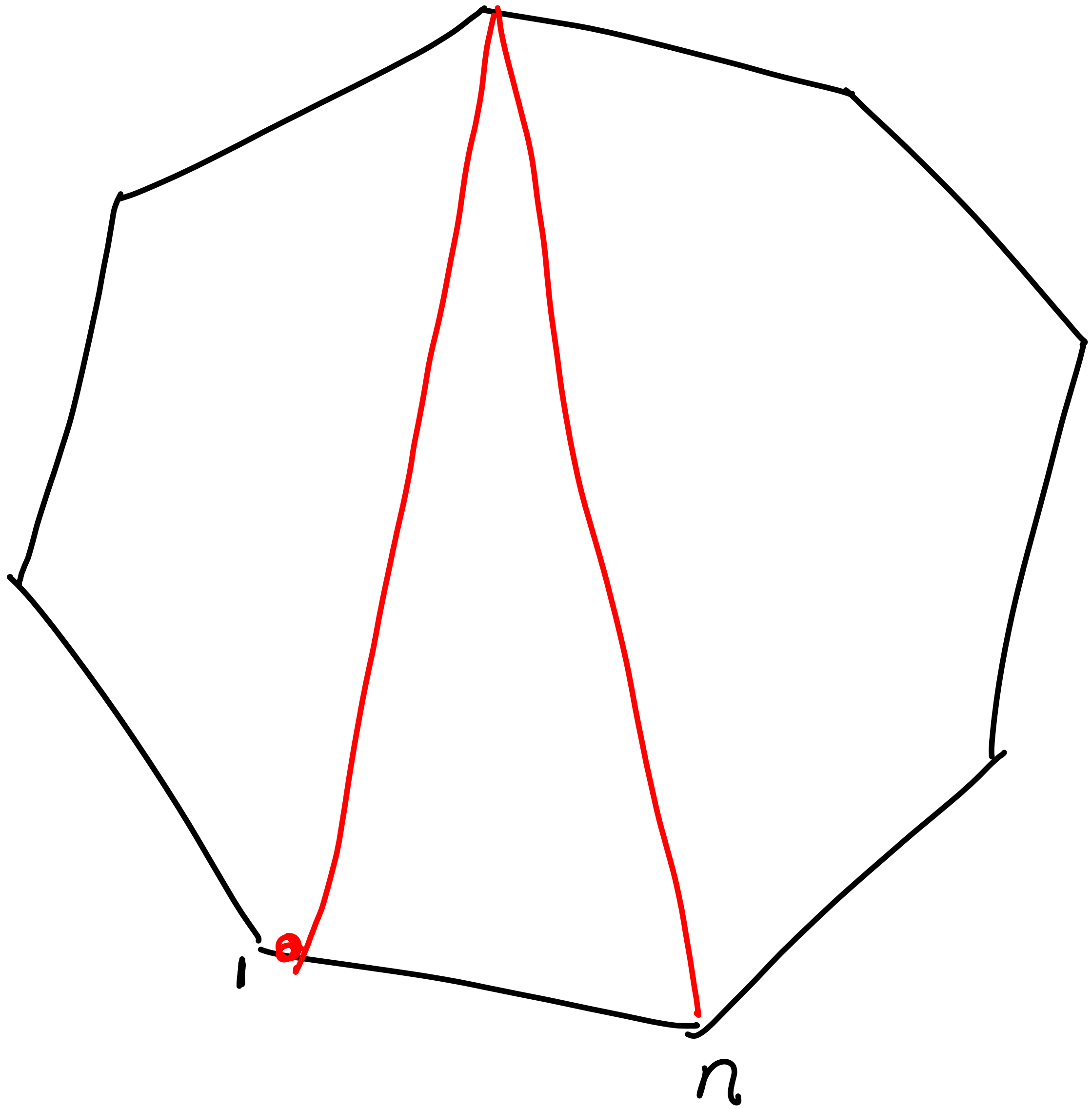


Triangulation

length = 2-8
+ 2-4
+ :
.

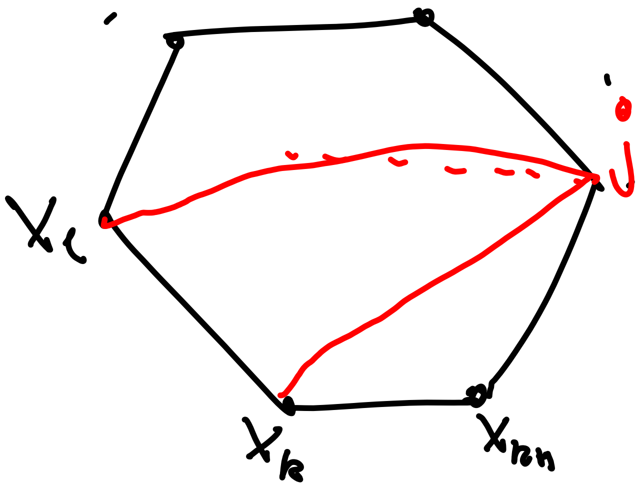
Problem: Length of a triangulation
= sum of lengths of internal edges

Find min. length triangulation



1
n

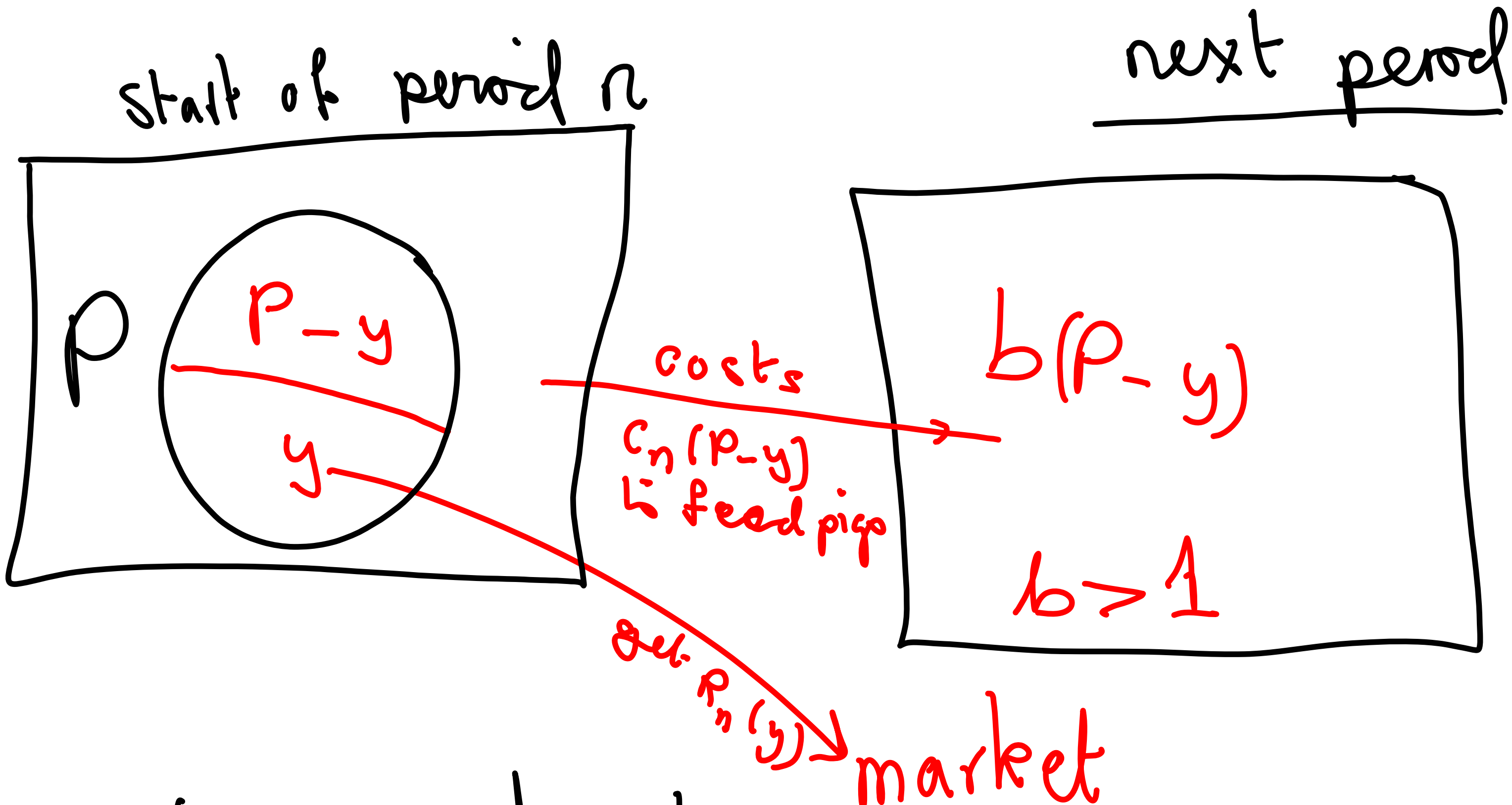
$m^*_{k,l}$ = min. length of triangulation on $x_k x_{k+1}, \dots x_l, x_k$



$$m^*_{k,l} = \min_{k<j<l} \left[m^*_{k,j} + m^*_{j,l} + |x_l, x_j| + |x_k, x_j| \right]$$

Want to compute $m^*_{1,n}$

Pig farming problem



N periods to go.

$$f_n(p) = \max_{0 \le y \le p} \left[R_n(y) - C_n(p-y) + f_{n+1}(b(p-y)) \right]$$

Now assume $R_n(x) = R_n x$ linear
$C_n(x) = C_n x$

Claim: $\exists\, a_1, a_2, \ldots a_{N+1}$ s.t.

$$f_n(P) = a_n P$$

Backward Induction:

$$f_{N+1}(P) = R_{N+1} P$$

$$a_{N+1} = R_{N+1}$$

$$f_n(P) = \max_{0 \le y \le P} \Big[R_n y - C_n(P-y) + a_{n+1} b(P-y) \Big]$$

induction

$$= \max_{0 \le y < P} \Big[a_{n+1} bP - C_n P + (R_n + C_n - a_{n+1} b) y \Big]$$

$$= \begin{cases} R_n P & R_n \ge a_{n+1} b - C_n \quad y = P \\ (a_{n+1} b - C_n) P & R_n < a_{n+1} b - C_n \quad y = 0 \end{cases}$$