Problem 1:

	1	2	3	4	5.
P_i	0.5	2	3	9.8	11.75.
Density	0.5	1	1	2.45	2.35.

with rod length $n=5$.

In this case, the Greedy strategy select {4 and 1}. the price is 10.3, However, it is better to sold the rod with $n=5$, which price is 11.75.

Problem 2: I think this question can't be solved by dynamic-programming. Because it doest not obey sub-optimality property.

For example.

Input is [BB⋯B (21 characters), This, line, ends, in, the].

suppose $M=21$.

then, the solution should be:

BB⋯B (21 characters). — 0 empty space.

This line ends in the (21 characters) — 0 empty space.

optimal solution is 0

However If input is [BB⋯B (21), This, line, ends, in, the (subset), the, word, is, astronomical]

Ⓐ case: one is:

BB⋯B (21) (0 empty)

This line ends in the (0 empty)

The word is (10 empty)

astronomical

optimal solution is 1000.

However Ⓑ case:

BB⋯B (21) (0 empty)

This line ends in (4 empty)

the the word is (6 empty)

Astronomical

The optimal is $4^3+6^3=280$.

it is a more optimal solution [illegible]

[illegible]

☆☆ Ⓑ case is more optimal than Ⓐ case, but [illegible]

Ⓐ case should be the optimal solution. it is contradict with sub optimality property.

P3.

	Q	A	G	G	T	A	B
Q	0	0	0	0	0	0	0
G	0	←0	↖1	↖1	←1	←1	←1
X	0	↑0	↑1	↑1	↑1	↑1	↑1
T	0	↑0	↑1	↑1	↖2	←2	←2
X	0	↑0	↑1	↑1	↑2	↑2	↑2
A	0	↖1	↑1	↑1	↑2	↖3	←3
Y	0	↑1	↑1	↑1	↑2	↑3	↑3
B	0	↑1	↑1	↑1	↑2	↑3	↖4

traceback, $B_4 \rightarrow A \rightarrow T \rightarrow G$.