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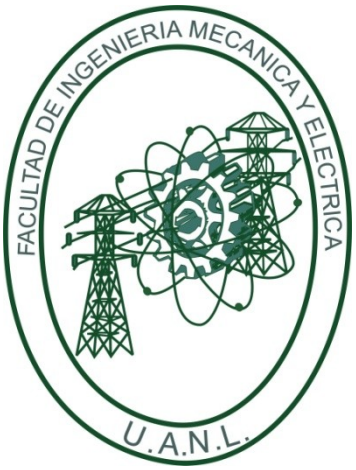

Knapsack Problem

Nombre del Alumno: Jorge Alejandro González Guerra

Matrícula: 1889169

Carrera: Ingeniería en Tecnologías de la Información (*ITS*)

Maestro: Iris Abril Martínez Salazar

Curso: Temas Selectos de Optimización

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Description:

It is required to test 3 different strategies to solve a Knapsack problem:

1. Considering Most Valuable Items first.
2. Considering Items with Less Weight first.
3. Considering Value/Weight relation, with the better relations first.

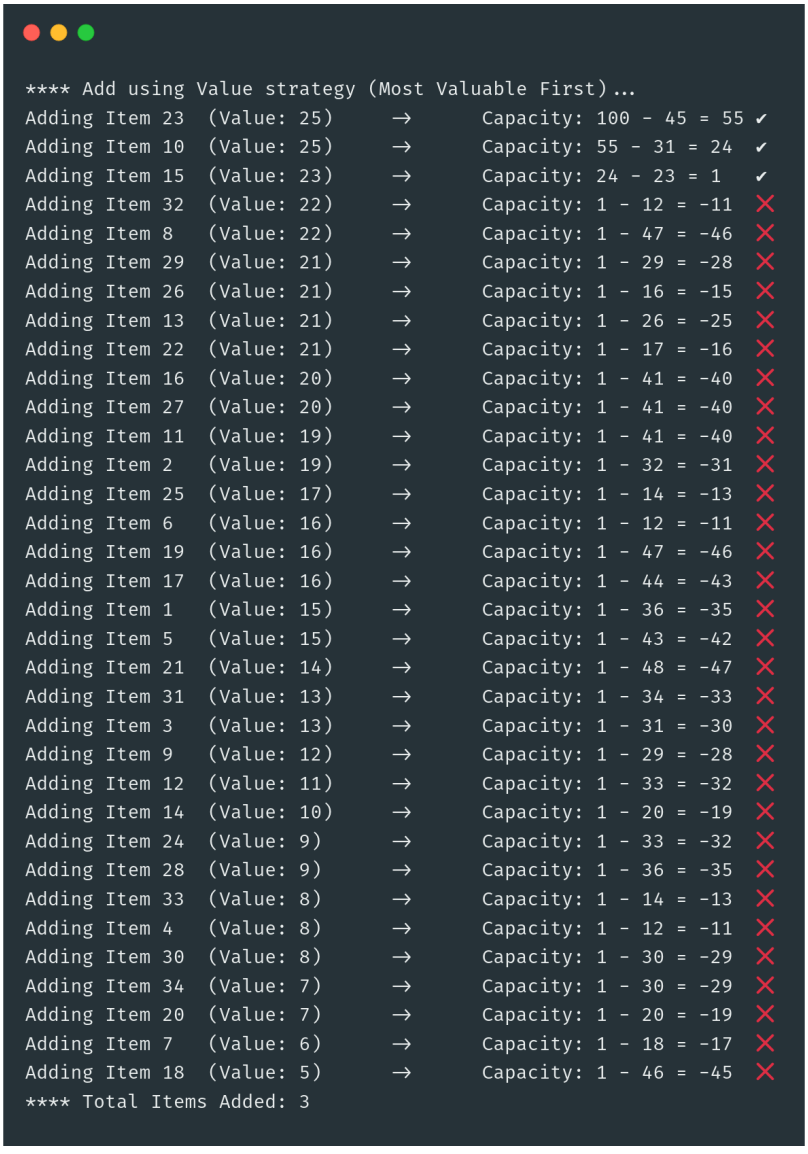
Our knapsack has a Maximum capacity of 100 (weight carry capacity), and we're provided with 35 items to test:

Item	Value	Weight
1	36	15
2	32	19
3	31	13
4	12	8
5	43	15
6	12	16
7	18	6
8	47	22
9	29	12
10	31	25
11	41	19
12	33	11
13	26	21
14	20	10
15	23	23
16	41	20
17	44	16
18	46	5
19	47	16
20	20	7
21	48	14
22	17	21
23	45	25
24	33	9
25	14	17

26	16	21
27	41	20
28	36	9
29	29	21
30	30	8
31	34	13
32	12	22
33	14	8
34	30	7

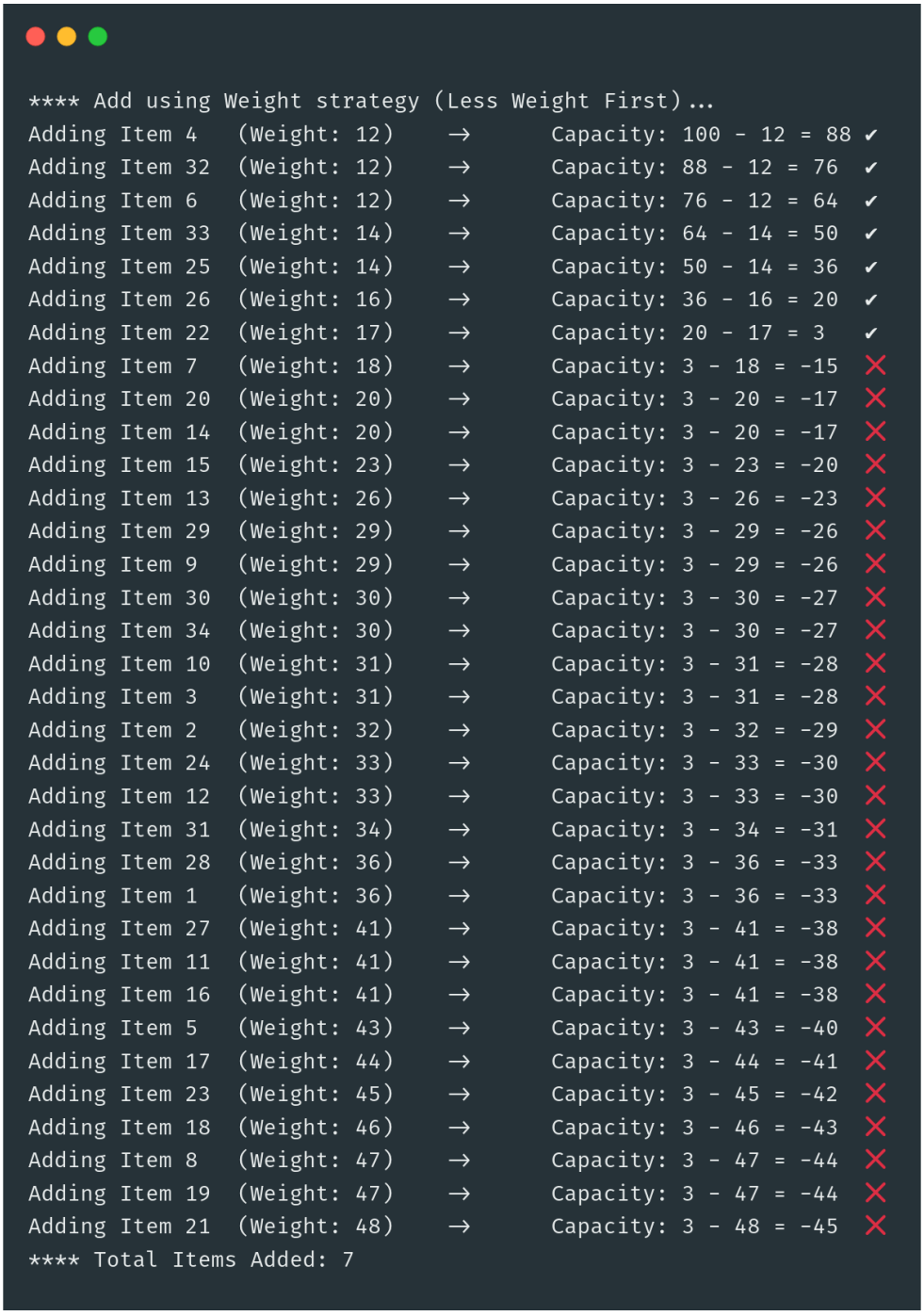
First Strategy: Most Valuable First

Our results were not what we expected. We ended up adding way less items than initially predirected:



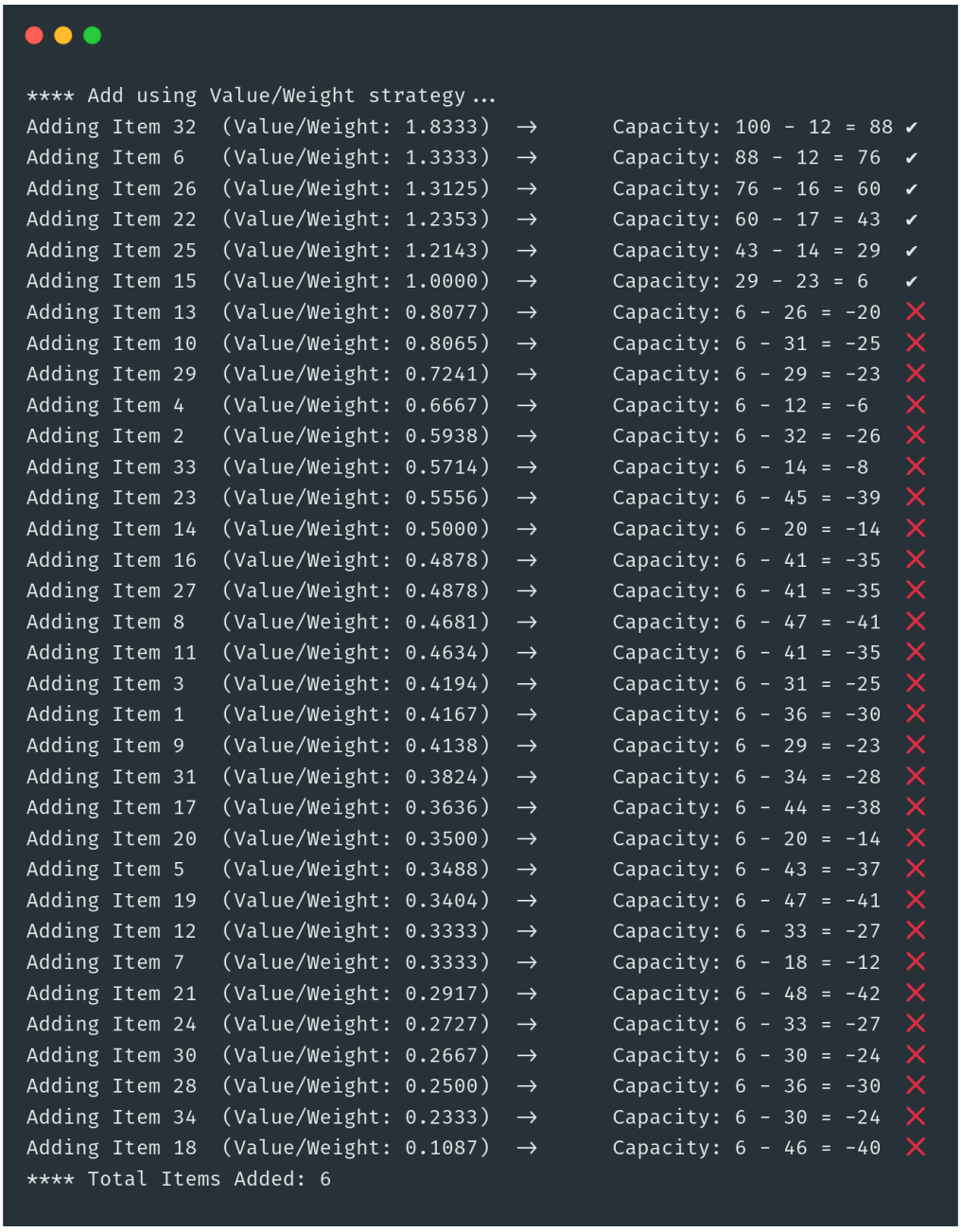
Second Strategy: Less Weight First

Here, our results were aswell not what we expected. We were able to add more items than predicted:



Third Strategy: Value/Weight Relation

Our results were almost those that we expected. Enough values were added to the knapsack (considering the overall weight) but we ended up adding a little less items than with the second strategy:



So, which strategy turned out to work better?

The *Less Weight First* strategy ended up working better for this scenario. I believe that the *Value/Weight Relation* strategy can work better in some other scenarios where the knapsack has a higher capacity, or the overall value and weight of the items are not that similar, a better categorization can take place with the third strategy.