Ferdinand Mudjialim

Lab 09

Weight Max = 11

[1, 2, 5, 6, 7] -> Values of [1, 6, 18, 22, 28]

Key Computations for “Improvement Changes”

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Items | Weight Limit of Briefcase | | | | | | | | | | | |
|  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| [1] | 0 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| [1,2] | 0 | 1 | 6 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 | 7 |
| [1,2,3] | 0 | 1 | 6 | 7 | 7 | 18 | 19 | 24 | 25 | 25 | 25 | 25 |
| [1,2,3,4] | 0 | 1 | 6 | 7 | 7 | 18 | 22 | 24 | 28 | 29 | 29 | 40 |
| [1,2,3,4,5] | 0 | 1 | 6 | 7 | 7 | 18 | 22 | 28 | 29 | 34 | 35 | 40 |

To find the values for each subset and current weight limit:

Compare the following values:

V1: The best value of the previous subset’s (current weight limit)

V2: Adding (last item value) to best value of previous subset’s (current weight limit) - (last item weight)

(That is, the last item in the array of items)

And simply take the higher of the two values.

For example, for the item set [1,2,3,4] at a weight limit of 11, the maximum value is 40 because the best value of the previous subset [1,2,3] at the weight limit of 11 is **25**, while adding item 4’s value to the best value of the previous subset at the weight limit of 11 - the weight of item 4 (essentially the best value of the previous subset at the weight limit of 5 + the value of item 4) = 18 + 22 = **40**. Since 40 > 25, the best value of the current subset at the weight limit of 11 is **40**.

Work:

Items [1,2,3]

|  |  |  |
| --- | --- | --- |
| Weight Limit | V1 | V2 |
| 5 | 7 | 18 + 0 = 18 |
| 6 | 7 | 18 + 1 = 19 |
| 7 | 7 | 18 + 6 = 24 |
| 8 | 7 | 18 + 7 = 25 |

[continued on next page]

Items [1,2,3,4]

|  |  |  |
| --- | --- | --- |
| Weight Limit | V1 | V2 |
| 6 | 19 | 22 + 0 = 22 |
| 7 | 24 | 22 + 1 = 23 |
| 8 | 25 | 22 + 6 = 28 |
| 9 | 25 | 22 + 7 = 29 |
| 11 | 25 | 22 + 18 = 40 |

Items [1,2,3,4,5]

|  |  |  |
| --- | --- | --- |
| Weight Limit | V1 | V2 |
| 7 | 24 | 28 + 0 = 28 |
| 8 | 28 | 28 + 1 = 29 |
| 9 | 29 | 28 + 6 = 34 |
| 10 | 29 | 28 + 7 = 35 |
| 11 | 40 | 28 + 7 = 35 |