Instructions:

I. A hiker has an **8 kg knapsack** and wants to pack the most valuable items for a trip. Help the hiker decide which items to take. **(Show your calculations and computation).**

Item	Item Name	Weight (wt i)	Value (val i)
1	Sleeping bag	2	1
2	First aid kit	3	2
3	Flashlight	4	5
4	Water Filter	5	6

II. **If you can solve the problem using Dynamic Programming Approach:** Determine the time and space complexity of the problem (Refer to the example in the Power point)

Submission:

Item	Item Name	Weight (*wt[i]*)	Value (*val[i]*)
1	Sleeping bag	2	1
2	First aid kit	3	2
3	Flashlight	4	5
4	Water Filter	5	6

DP Table Calculation

We initialize a table with 5 rows (4 items + 1) and 9 columns (max weight 8 + 1).

i \ w	0	1	2	3	4	5	6	7	8
0	0	0	0	0	0	0	0	0	0
1	0	0	1	1	1	1	1	1	1
2	0	0	1	2	2	3	3	3	3
3	0	0	1	2	5	5	6	7	7
4	0	0	1	2	5	6	7	7	8

Optimal Solution

The maximum value the hiker can carry is **8** (from row 4, column 8).

Final selection: First Aid Kit and **Water Filter**