HW14

Daniel Ginsburg

|  |  |  |  |
| --- | --- | --- | --- |
| Item | name | Weight | Value |
| 1 | W1 | 2 | 3 |
| 2 | W2 | 4 | 5 |
| 3 | W3 | 5 | 6 |
| 4 | W4 | 7 | 8 |
| 5 | W5 | 8 | 10 |

1)

Pack a knapsack with capacity = 20 so that the total value is maximized

Graph of optimal value



Maximum value: 24

2)

|  |  |  |  |
| --- | --- | --- | --- |
| Item | name | Weight | Value |
| 1 | W1 | 2 | 3 |
| 2 | W2 | 4 | 5 |
| 3 | W3 | 5 | 6 |
| 4 | W4 | 7 | 8 |

Pack a knapsack with capacity = 19 so that the total value is maximized

Graph of optimal value



Maximum value: 22

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Total weight available | | | | | | | | | | | | | | | | | | | | | | |
| # items considered |  | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 2 | 0 | 0 | 3 | 3 | 5 | 5 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 | 8 |
| 3 | 0 | 0 | 3 | 3 | 5 | 6 | 8 | 9 | 9 | 11 | 11 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 | 14 |
| 4 | 0 | 0 | 3 | 3 | 5 | 6 | 8 | 9 | 9 | 11 | 11 | 14 | 14 | 16 | 17 | 17 | 19 | 19 | 22 | 22 | 22 |
| 5 | 0 | 0 | 3 | 3 | 5 | 6 | 8 | 9 | 10 | 11 | 13 | 14 | 15 | 16 | 18 | 19 | 19 | 21 | 21 | 24 | 24 |