Aufgabe 1.65

Gegeben seien folgende Größen:

n	0	1	2	3	4	5
a_n	6	5	4	3	2	1
b_{1n}	7	8	9	10	11	12
b_{2n}	-1	-2	-3	-4	-5	-6
b_{3n}	1	-1	1	-1	1	-1

Berechnen Sie

$$\sum_{n=0}^{2} a_{2n}, \quad \sum_{i=0}^{4}(a_i+1), \quad \sum_{i=0}^{4} a_{i+1}, \quad \sum_{i=0}^{4} a_i + 1, \quad \sum_{i=1}^{3} b_{ii},$$

$$\sum_{i=1}^{2}\sum_{j=3}^{5} b_{ij}, \quad \sum_{k=1}^{3} b_{3k}b_{k5}, \quad \sum_{l=1}^{3}\left(l \sum_{m=l+1}^{4} b_{lm} \right) \ !$$

Lösung:

a) $\displaystyle\sum_{n=0}^{2} a_{2n} = a_0 + a_2 + a_4 = 6 + 4 + 2 = 12$

b) $\displaystyle\sum_{i=0}^{4}(a_i+1) = (a_0+1) + (a_1+1) + (a_2+1) + (a_3+1) + (a_4+1) = 7+6+5+4+3 = 25$

c) $\displaystyle\sum_{i=0}^{4} a_{i+1} = a_1 + a_2 + a_3 + a_4 + a_5 = 5+4+3+2+1 = 15$

d) $\displaystyle\sum_{i=0}^{4} a_i + 1 = a_0 + a_1 + a_2 + a_3 + a_4 + 1 = 6+5+4+3+2+1 = 21$

e) $\displaystyle\sum_{i=1}^{3} b_{ii} = b_{11} + b_{22} + b_{33} = 8 - 3 - 1 = 4$

f) $\displaystyle\sum_{i=1}^{2}\sum_{j=3}^{5} b_{ij} = \sum_{i=1}^{2}\left(\sum_{j=3}^{5} b_{ij} \right) = (10+11+12) + (-4-5-6) = 18$

g) $\displaystyle\sum_{k=1}^{3} b_{3k}b_{k5} = b_{31}b_{15} + b_{32}b_{25} + b_{33}b_{35} = (-1)\cdot 12 + 1\cdot(-6) + (-1)\cdot(-1) = -17$

h) $\displaystyle\sum_{l=1}^{3}\left(l \sum_{m=l+1}^{4} b_{lm} \right) = \sum_{m=2}^{4} b_{1m} + 2\sum_{m=3}^{4} b_{2m} + 3b_{34} = 1\cdot(9+10+11) + 2\cdot(-4-5) + 3\cdot 1 = 15$