

# HW3: Problem 1

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## 1 Part 1

### 1.1 Subsection A

Here is the calculation for the first outer product:  $\begin{bmatrix} 0.43226352 & 0.25222353 & 0.48671532 \\ 0.10984608 & 0.06409462 & 0.12368328 \\ 0.42953904 & 0.25063381 & 0.48364764 \end{bmatrix}$ .

### 1.2 Subsection B

The first term for the Kruskal tensor is:  $\begin{bmatrix} 7.53169304 & 8.36104576 \\ 6.95335795 & 7.71902727 \\ 6.47565559 & 7.18872227 \\ 4.39470396 & 4.87862699 \\ 4.05724843 & 4.50401252 \\ 3.77851157 & 4.19458254 \\ 8.48045282 & 9.41427827 \\ 7.82926544 & 8.69138536 \\ 7.29138739 & 8.09427885 \\ 1.91394119 & 2.12469491 \\ 1.76697565 & 1.96154625 \\ 1.64558273 & 1.82678614 \\ 1.11677479 & 1.2397485 \\ 1.03102116 & 1.1445521 \\ 0.96018902 & 1.06592027 \\ 2.15503843 & 2.39234059 \\ 1.98955979 & 2.20864026 \\ 1.85287512 & 2.05690455 \\ 7.48422212 & 8.30834757 \\ 6.90953217 & 7.67037562 \\ 6.43484068 & 7.14341346 \\ 4.36700493 & 4.84787787 \\ 4.03167631 & 4.47562453 \\ 3.75469628 & 4.16814484 \\ 8.42700203 & 9.35494175 \\ 7.77991897 & 8.6366051 \\ 7.24543108 & 8.04326205 \end{bmatrix}$ .

The second term for the Kruskal tensor is:  $\begin{bmatrix} -2.5740198 & -3.47992588 \\ -0.99973259 & -1.35158063 \\ -0.82170374 & -1.11089593 \\ -0.82750998 & -1.11874563 \\ -0.32139951 & -0.43451354 \\ -1.61396023 & -2.18198087 \\ -1.62536463 & -2.19739896 \\ -0.63128107 & -0.8534555 \\ 4.33091368 & 5.85514478 \\ 4.36151634 & 5.8965178 \\ 1.69398464 & 2.29016924 \\ 1.39232585 & 1.88234401 \\ 1.40216416 & 1.89564483 \\ 0.54459146 & 0.73625615 \end{bmatrix}$ .

[ 2.73475515 3.69723077]  
[ 2.7540792 3.72335577]  
[ 1.06966649 1.44612721]  
[-3.54806272 -4.79677556]  
[-3.57313368 -4.83067005]  
[-1.38778193 -1.87620089]  
[-1.14065063 -1.54209368]  
[-1.14871058 -1.55299026]  
[-0.44615173 -0.60317134]  
[-2.24042397 -3.02892361]  
[-2.25625502 -3.05032627]  
[-0.87631481 -1.18472693]].

Here is the calculation for the Kruskal tensor: [[4.97573389 4.90553684]

[4.37933814 4.23910139]  
[5.475923 5.83714207]  
[3.57300022 3.76773106]  
[3.22973844 3.38526689]  
[3.45711206 3.760069 ]  
[6.86649259 7.23229739]  
[6.20390081 6.4939864 ]  
[6.66010632 7.24082335]  
[6.24485487 7.97983969]  
[6.12849198 7.85806405]  
[3.33956736 4.11695539]  
[2.50910064 3.12209251]  
[2.43318532 3.04019693]  
[1.50478047 1.80217642]  
[4.88979358 6.08957136]  
[4.74363899 5.93199602]  
[2.92254161 3.50303177]  
[3.9361594 3.51157201]  
[3.33639849 2.83970557]  
[5.04705875 5.26721256]  
[3.22635429 3.3057842 ]  
[2.88296573 2.92263427]  
[3.30854455 3.5649735 ]  
[6.18657807 6.32601814]  
[5.52366395 5.58627883]  
[6.36911627 6.85853512]].