1a:

transform

[[-0.45827554 0.29474236 0.01395749 -0.00402579]

[ 0.05085589 0.05458471 0.54105993 0.05237592]

[-0.10900958 -0.1783455 0.04426783 -0.5968205 ]]

<u, v> first

[[ 1.04675226]

[-0.36260293]]

<u, v> last

[[ 0.14190605]

[-0.451843 ]]

residual first point

[0.00264821]

residual last point

[0.4065751]

1b:

|  |  |  |
| --- | --- | --- |
| K=8 residuals | K=12 residuals | K=16 residuals |
| .0096 | .0020 | .0031 |
| .0116 | .0092 | .0024 |
| .0046 | .0050 | .0031 |
| .0033 | .0043 | .0030 |
| .0048 | .0046 | .0018 |
| .0079 | .0061 | .0051 |
| .0151 | .0048 | .0017 |
| .0041 | .0051 | .0062 |
| .0030 | .0061 | .0018 |
| .0156 | .0045 | .0027 |

best m

[[-0.45823345 0.29491868 0.01376227 -0.00407002]

[ 0.05078784 0.05452477 0.54135718 0.05227555]

[-0.10892486 -0.17804328 0.04392604 -0.5966514 ]]

Differences: with k = 8, the residuals had the most variability, and k=16 had the lowest variability overall

With k=12 being somewhere in the middle

1c:

My calculated center was

[[-1.51555537]

[-2.35420549]

[ 0.28273153]]

2a:

F\_tilda =

[[-6.60698417e-07 8.82396296e-06 -9.07382302e-04]

[ 7.91031621e-06 1.21382933e-06 -2.64234650e-02]

[-1.88600198e-03 1.72332901e-02 9.99500092e-01]]

2b:

F\_rank2=

[[-5.36264198e-07 8.83539184e-06 -9.07382264e-04]

[ 7.90364771e-06 1.21321685e-06 -2.64234650e-02]

[-1.88600204e-03 1.72332901e-02 9.99500092e-01]]

2c:

A room with many computers and tables

Description automatically generatedA room with many computers and tables

Description automatically generated