

Problem_5_a

December 8, 2021

1 Problem 5 a

1.1 Initialization of inputs

```
[1]: using LinearAlgebra
```

```
A = rand(6, 3)
svd_val = svd(A)
B = qr(A)
V_1 = Matrix{I, 3, 3}
U_1 = Matrix{I, 3, 3}
U = svd_val.U[1:3, :]
V = svd_val.V
B_Rval = B.R
@show V
@show U
@show svd_val.S
```

```
V = [-0.6249253382105985 0.24209128391820978 0.7421995229809851;
-0.4857623132922393 -0.8648277203228508 -0.1269172531461077; -0.6111491607188391
0.4398463645547315 -0.6580515777206564]
U = [-0.3715908661972523 0.5322281900806818 -0.011126102187339242;
-0.5276748817996341 0.11076299139361971 -0.476132528978808; -0.42015100851219706
-0.29381218285153266 0.7958182714053809]
svd_val.S = [2.3561774166233853, 0.672338383727934, 0.45506340050374094]
```

```
[1]: 3-element Vector{Float64}:
 2.3561774166233853
 0.672338383727934
 0.45506340050374094
```

1.2 Value Computation

```
[2]: for i in 1:25
      B_Rval = B.R
      if i%2 == 0
          V_1 = V_1 * B.Q
      elseif i > 1
```

```

        U_1 = U_1*B.Q
    end
    B = qr((B.R)')
end

```

1.3 Printing Output Values

```

[3]: @show Diagonal(svd_val.S)
      @show B_Rval

```

```

Diagonal(svd_val.S) = [2.3561774166233853 0.0 0.0; 0.0 0.672338383727934 0.0;
0.0 0.0 0.45506340050374094]
B_Rval = [-2.356177416623384 -7.121827569500625e-14 -1.5482251638462476e-17; 0.0
-0.6723383831339357 2.0804517899806468e-5; 0.0 0.0 0.4550634009057804]

```

```

[3]: 3×3 Matrix{Float64}:
-2.35618  -7.12183e-14  -1.54823e-17
 0.0      -0.672338    2.08045e-5
 0.0      0.0          0.455063

```

```

[4]: @show V
      @show V_1

```

```

V = [-0.6249253382105985 0.24209128391820978 0.7421995229809851;
-0.4857623132922393 -0.8648277203228508 -0.1269172531461077; -0.6111491607188391
0.4398463645547315 -0.6580515777206564]
V_1 = [0.6249253382106066 -0.24213366516666363 -0.7421856976898149;
0.4857623132922114 0.8648349662386619 0.12686786888717322; 0.6111491607188536
-0.4398087872745738 0.6580766930903341]

```

```

[4]: 3×3 Matrix{Float64}:
 0.624925  -0.242134  -0.742186
 0.485762   0.864835   0.126868
 0.611149  -0.439809   0.658077

```