

BLG202E – ASSIGNMENT2

Student Name: Ahmet Furkan Kavraz

Student Num: 150190024

Q3)

For the vector $[1, 2, -1]$, the iterations are as in the below. The eigenvalues converges to -6 which is one of the real eigenvalue of matrix A. The eigenvector converges with error. The real value is $[0.7, -0, -0.7]$ but we find $[-0.692, 0.014, 0.721]$ in fifth iteration (direction of the vector is not important).

```
Eigenvalue1: -4.714285714285715
Eigenvector1: [-0.43643578  0.21821789  0.87287156]

Eigenvalue1: -5.640000000000001
Eigenvector1: [ 0.80829038  0.11547005 -0.57735027]

Eigenvalue1: -5.90721649484536
Eigenvector1: [-0.64483142  0.05862104  0.7620735 ]

Eigenvalue1: -5.976623376623377
Eigenvector1: [ 0.73561236  0.02942449 -0.67676337]

Eigenvalue1: -5.994144437215356
Eigenvector1: [-0.69215012  0.0147266  0.72160331]
```

For the vector $[1, 2, 1]$, the iterations are as in the below. In this iteration convergence starts from the first iteration. The eigenvalues converges to 3 which is one of the real eigenvalue of matrix A. The eigenvector converges $[0.577, 0.577, 0.577]$ which is nearly same with real eigenvector.

```
Eigenvalue2: 3.000000000000001
Eigenvector2: [0.57735027 0.57735027 0.57735027]

Eigenvalue2: 3.0
Eigenvector2: [0.57735027 0.57735027 0.57735027]

Eigenvalue2: 2.9999999999999996
Eigenvector2: [0.57735027 0.57735027 0.57735027]

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Eigenvalue2: 2.9999999999999996
Eigenvector2: [0.57735027 0.57735027 0.57735027]
```

The limits are different because matrix has more than one eigenvector and eigenvalue.