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Comp502 Hw6
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(1)
matlab code is [x,y,z]=princomp(zscore(testx)); where testx is input iris data set.
X corresponds to P, and z corresponds to eigenvalues.(zscore(testx) is to make input data preprocessed to have zero mean in each column).
eigenvector P is

```
[
    0.5413    0.3309    0.6945   -0.3395
   -0.1768    0.9434   -0.2428    0.1408
    0.5863   -0.0237   -0.0507    0.8081
    0.5762    0.0029   -0.6754   -0.4603
]
```

P*P'=

```
[
    1.0000   -0.0000   -0.0000    0.0000
   -0.0000    1.0000    0.0000    0.0000
   -0.0000    0.0000    1.0000    0.0000
    0.0000    0.0000    0.0000    1.0000
]
```

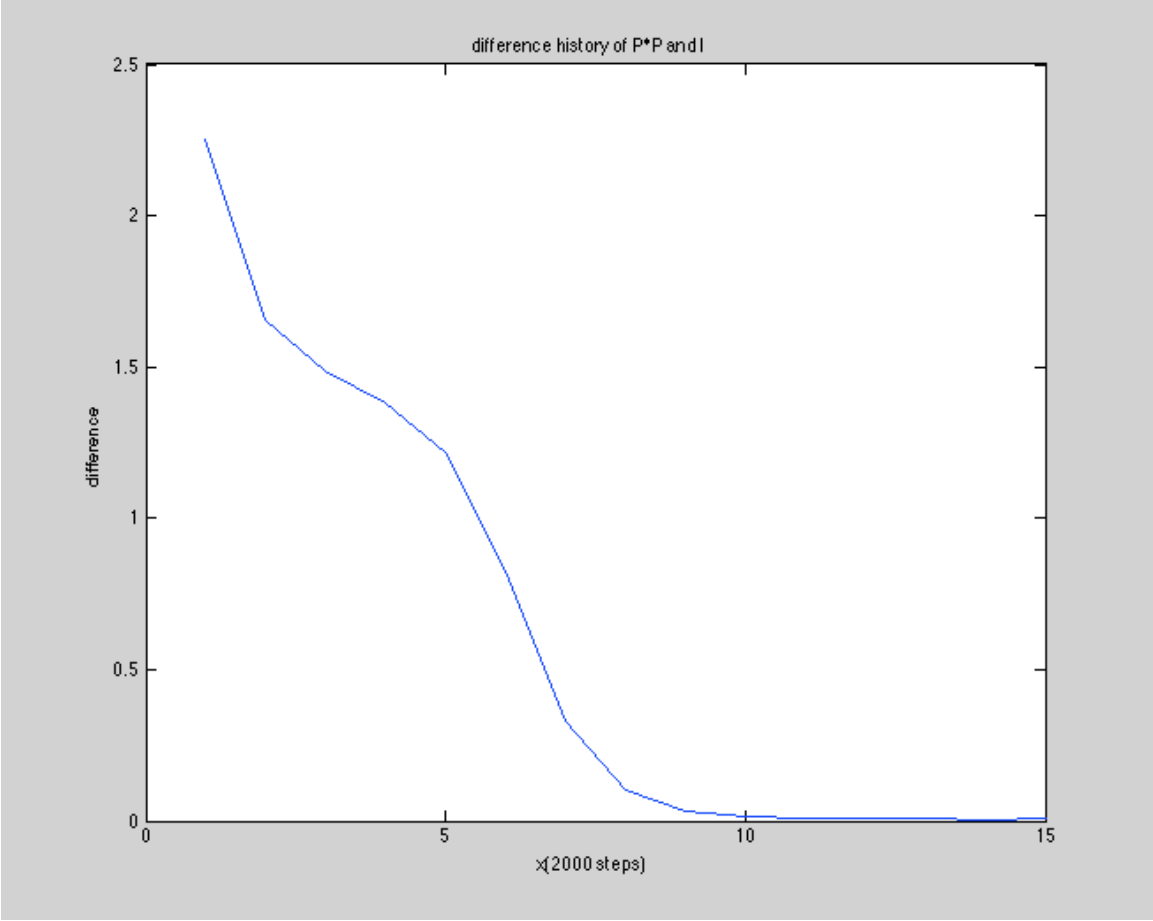
=I
checked.

eigenvalues are

```
[
    2.8575
    1.0160
    0.1008
    0.0257
]
```

(2)
GHA learning rate is 0.0005; number of iterations is 15000, initial weights are

1.5624	0.3965	2.2593	2.0700
2.2621	1.4600	2.4155	2.0735
0.3547	1.3625	2.0942	1.9528
2.1531	2.2582	2.2879	1.8847



The method to calculate the difference of P*P' and I is like this. Get the absolute value matrix of P*P' –I. Then sum over this matrix to get difference.

```
myi=W*W';
diff=myi-eye(4);
diff=sum(sum(abs(diff)));
```

Final Eigenvector P is

```
[
    0.5416   -0.3311   -0.6950    0.3389
   -0.1761   -0.9438    0.2428   -0.1413
    0.5864    0.0236    0.0506   -0.8091
    0.5764   -0.0030    0.6757    0.4600
]
```

The eigenvector from part 1 is

```
[
    0.5413    0.3309    0.6945   -0.3395
   -0.1768    0.9434   -0.2428    0.1408
    0.5863   -0.0237   -0.0507    0.8081
    0.5762    0.0029   -0.6754   -0.4603
]
```

So we can see they are pretty similar, except the some signs are reversed.

P(gha)*P(gha)'=

```
[
    1.0007    0.0005    0.0005   -0.0005
    0.0005    1.0007    0.0011    0.0004
    0.0005    0.0011    1.0015   -0.0001
   -0.0005    0.0004   -0.0001    1.0004
]
```

which is pretty much like I

```
[
    1.0000   -0.0000   -0.0000    0.0000
   -0.0000    1.0000    0.0000    0.0000
   -0.0000    0.0000    1.0000    0.0000
    0.0000    0.0000    0.0000    1.0000
]
```