Homework#7

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목차

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1. Purpose of program
- Jacobi transformation을 이용해 matrix A의 eigenvalue&vector를 구한다.
- **Jacobi transformation**: 특정 rotation matrix를 반복 이용해 A의 대각성분 이외의 성분을 0으로 만들어서 eigenvalue&vector를 구하는 방식.

2 .Experimental process
< matrix A 생성 >

```
for (int i = 1; i <= N; i++)
        for (int j = 1; j <= N; j++) {
                idum = time(NULL);
                A[i][j] = gasdev(&idum);
        }
```

Gaussian distribution(mean=0.0, standard deviation=1.0)을 이용해 11*11 matrix A를 생성한다.

< Jacobi transformation >

```
/* Jacobi transformation을 이용해 eigenvalue&vector 구하기*/
        jacobi(A, N, d, v, &nrot);

/* A의 eigenvalues를 descending order로 정렬하기 */
        eigsrt(d, v, N);
```

Jacobi transformation적용 후 descending order로 eigenvalue&vecotr 정렬한다.

3.Result

▶eigenvalue&vecotr 출력

```
eigenvalues:
 1번째:  4.069288   2번째:  2.661546   3번째:  2.498589   4번째:  1.762021
 5번째:  1.288102   6번째:  0.614441   7번째: -0.979729   8번째: -2.191173
 9번째: -2.344517  10번째: -3.556933  11번째: -4.614582

eigenvector:
 1번째:  0.527474  0.513359 -0.247665 -0.016987  0.035503  0.003958  0.248519
 -0.343532  0.097505 -0.357878  0.279234

 2번째: -0.175666  0.275778  0.381731  0.348510 -0.240325  0.070327 -0.401983
  0.025522 -0.426753 -0.322903  0.338499

 3번째:  0.201755 -0.457526  0.210202  0.468499  0.164549  0.092173 -0.027877
  0.089052  0.521188 -0.403192  0.088363

 4번째:  0.013513  0.301675 -0.037829 -0.228789  0.075603  0.343754 -0.353510
  0.428380  0.446098  0.269226  0.388826

 5번째:  0.111134 -0.240178 -0.515221  0.367920  0.408579  0.115898 -0.080479
  0.055043 -0.409839  0.241855  0.335869

 6번째:  0.516685 -0.009142  0.589297  0.023700  0.096399  0.312348  0.258709
  0.049069 -0.241628  0.385598 -0.043093

 7번째: -0.305117 -0.237325 -0.082653 -0.215738 -0.239444  0.575152  0.502983
  0.049671 -0.106550 -0.241407  0.289798

 8번째: -0.511656  0.396726  0.150068  0.392449  0.395029  0.085671  0.338340
 -0.208773  0.205945  0.198312 -0.033024

 9번째: -0.033921 -0.228370  0.107225  0.052757 -0.378748 -0.312057  0.058520
 -0.409744  0.203364  0.422001  0.548479

10번째:  0.026798  0.128226 -0.002157  0.156476 -0.121891 -0.486237  0.454527
  0.683676 -0.049210 -0.018185  0.174088

11번째: -0.118121 -0.141393  0.306186 -0.492607  0.600227 -0.292295 -0.003040
 -0.055682 -0.117631 -0.222284  0.342896
```