Arrai structure(only exist 2d inside):

Attribute:

Ndim(is always 2)

Shape

Size

Array(is always 2S array)

Method:

\*\*\*all shape that used as parameter, its length only can be 2(only doing for matrix)

Ones(shape)

Zeros(shape)

Identity(shape)

Full(shape, value)

Reshape(shape)

Arange(range)

Table of methods to used by arrai(both vector and matrix) and its operators

|  |  |  |
| --- | --- | --- |
| operator | Vector(1,m)/(m,1) | Matrix(m,n) |
| dot(a, b) | Dot of vector | - |
| \*  if one of a or b are 0-D, will just do scalar multiplication | Multiplication of vector to get matrix | multiplication of matrix |
| +/- | Addition and subtraction | Addition and subtraction |

Already Done:

|  |  |  |
| --- | --- | --- |
| Vector / Matrix | Title | Done? |
| Vector(p1) | Dot of Vector(1%) | done |
|  | Vector addition(1%) | done |
|  | Scalar Multiplication with vector (1%)  若vector只有一個元素時，就是Scalar |  |
|  | Norm of Vector (2%) |  |
|  | Vector normalization (2%) |  |
| Vector(p2) | Cross product (2%) |  |
|  | Component of a on b (2%) |  |
|  | Projection of a on b (2%) |  |
|  | Triangle area (2%) |  |
|  | Parallel judgement(2%) |  |
| Vector(p3) | Orthogonal judgement(3%) |  |
|  | The angle between two vectors(degree) (5%) |  |
|  | The plane normal that is produced by two vectors (5%) |  |
|  | Linear independent judgement(10%) |  |
|  | Use Gram-schmidt to find orthonormal basis(5%) |  |
| Matrix(p1) | Matrix addition & subtraction(2%) | done |
|  | Matrix Multiplication(2%) |  |
|  | Rank of Matrix(5%) |  |
|  | Matrix Transpose(2%) |  |
| Matrix(p2) | Solve Linear System(10%) |  |
|  | Determinants of Matrix(3%) |  |
|  | Inverse Matrix(6%) |  |
|  | Adjoint of Matrix(4%) |  |
| Matrix(p3) | Eigen Vector and Eigen Value(10%)(all eigen vector and eigen value) |  |
|  | Power Method of Dominate Eigen value and vector(10%) |  |
|  | Method of Least Square(6%) |  |