Mercury Goodwin

Pseudocode

CS2300

Part 1:

Read the input file

Read the first line and convert the first two numbers into a 2x2 matrix

Read the third number in both lines and turn them into a vector b

Find the determinant of A

Check if the system is inconsistent or underdetermined

Find the solution for x

Output the result

Part 2

Read matrix A and vector b from file

Split lines to read

Get each value

Turn values into matrix A

Read the third number in both lines and turn them into a vector b

Calculate eigenvalues 1 and 2

Construct the diagonal matrix

Find the eigenvector corresponding to lambda1

Normalize X1

Find the eigenvector corresponding to lambda2

Normalize X2

Get R transpose

Get R by Lambda

Get R Lambda R Transpose

Print

Part 3

Get line count

Read in the points

Compute the area

return abs((x2-x1)\*(y3-y1) - (x3-x1)\*(y2-y1)) / 2

Compute distance

If 2D

x1, x2, x3 = points[0]

y1, y2, y3 = points[1]

a = y1 - y2

b = x2 - x1

c = x1\*y2 - x2\*y1

d = math.sqrt(a\*\*2 + b\*\*2)

return abs(a\*x3 + b\*y3 + c) / d

If 3D

x1, x2, x3 = points[0]

y1, y2, y3 = points[1]

z1, z2, z3 = points[2]

a = y1\*(z2-z3) + y2\*(z3-z1) + y3\*(z1-z2)

b = z1\*(x2-x3) + z2\*(x3-x1) + z3\*(x1-x2)

c = x1\*(y2-y3) + x2\*(y3-y1) + x3\*(y1-y2)

d = -x1\*(y2\*z3-y3\*z2) - x2\*(y3\*z1-y1\*z3) - x3\*(y1\*z2-y2\*z1)

e = math.sqrt(a\*\*2 + b\*\*2 + c\*\*2)

return abs(a\*x3 + b\*y3 + c\*z3 + d) / e

Print