HW_5

March 4, 2020

```
[1]: import numpy as np
     import matplotlib.pyplot as plt
     import csv
```

```
[12]: similarities = np.loadtxt(open("Assignment5-similarities.csv", "rb"),␣
      ↪delimiter=",", skiprows=1)

      initial_points = []
      for i in range(1,22):
          initial_points.append([np.random.uniform(0, 1), np.random.uniform(0, 1)])
      initial_points

      def dist(i, j):
          return(np.sqrt((j[0] - i[0])**2 + (j[1] - i[1])**2))
```

1   Q1

You could compute a similarity into a distance by: * calculating (1-similarity) * calculating sqrt(1-similarity) * calculating

2   Q2

```
[21]: distance_matrix = []
      for i in similarities[0:21]:
          distance_matrix.append(np.sqrt(1 - i))

      def stress(distances, mds_points):
          stress = 0
          for x in range(0, 21):
              for y in distances[x]:
                  stress += (y - dist(mds_points[x-1], mds_points[x]))
          return stress
```

```
[22]: stress(distance_matrix, initial_points, 0)
```

[22]: 115.10234579666782

3 Q3

[ ]:

[ ]: