**Experiment 20**: Nearest Neighbor

(Edit this document as needed)

Partner 1: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Partner 2: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Part A:*

1)

|  |  |
| --- | --- |
| Norm of scalar x  |  |
| Norm of 1 |  |
| Norm of -3 |  |

2) a) Compute the norm of $\left[\begin{matrix}1\\1\end{matrix}\right]$. Show your work.

 b) Compute the norm of $\left[\begin{matrix}2\\1\end{matrix}\right]$. Show your work.

c) Compute the norm of $\left[\begin{matrix}1\\2\\2\end{matrix}\right]$. Show your work.

d) Compute the norm of $\left[\begin{matrix}2\\0\\3\end{matrix}\right]$*.* Show your work.

3)

a)

 b)

 c)

 d)

 e) $x^{T}x$ =

4)

a) Compute the distance between $\left[\begin{matrix}1\\1\end{matrix}\right]$ and $\left[\begin{matrix}2\\1\end{matrix}\right]$. Show your work.

b) Compute the distance between $\left[\begin{matrix}1\\2\\2\end{matrix}\right]$ and $\left[\begin{matrix}2\\0\\3\end{matrix}\right]$. Show your work.

*Part B:*

2) Add the code here.

3) Add the code here.

4) Add the code here. Explain the following line of code

predicted\_subject = fix((index-1)/(S-1))+1;

5) Add the code here.

6) Report the accuracies for different number of components kept.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Number of Components | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Accuracy |  |  |  |  |  |  |  |  |  |  |

Due: April 7th, 2022 at 11:59 pm eastern on Gradescope

One student submits on Gradescope and adds their partner using “add group members” option on Gradescope.