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Homework 5

For this homework, I utilized two linear associators to draw results for two different problems. The first linear associator used error correction to understand the ship's origin, and the second determined the required action, determining if the action against the ship should be binned friendly, alert, or hostile. In order to determine planet of origin, I built input vectors from the dataset provided. I started with a few input fields (vector dimensions), but ultimately used many data points in order to achieve a high accuracy rate.

When building the input vectors, I used the following data inputs to provide a comprehensive understanding of the data set:

- Name has only letters
- Name starts with a vowel
- Name has numbers
- WDVI = 6.4
- WDVI = 6.5
- WDVI = 6.6
- WDVI = 6.7
- WDVI = 6.8
- WDVI = 6.9
- WDVI = 7
- WDVI = 7.1
- WDVI = 7.2
- WDVI = 7.3
- WDVI = 7.4
- HTF ends with .0
- HTF > 1000
- HTF ≤ 1000
- HTF = 940 – 949

- HTF = 950 – 959
- HTF = 960 – 969
- HTF = 970 – 979
- HTF = 980 – 989
- HTF = 990 – 999
- HTF = 1000 – 1009
- HTF = 1010 – 1019
- HTF = 1020 – 1029
- HTF = 1030 –1039
- HTF = 1040 – 1049
- HTF = 1050 – 1059
- HTF = 1060 – 1069
- Surface Reflectivity = Dark Prefix
- Surface Reflectivity = Light Prefix
- Surface Reflectivity = Black
- Surface Reflectivity = Gray
- Surface Reflectivity = Blue
- Surface Reflectivity = Green
- Surface Reflectivity = Pink
- Surface Reflectivity = Orange
- Surface Reflectivity = Yellow
- Surface Reflectivity = White
- Long : Short Axis 1-1.2
- Long : Short Axis 1.3-1.5
- Long : Short Axis 1.6-1.8
- Long : Short Axis 1.9-2.1
- Long : Short Axis 2.2-2.4
- Long : Short Axis 2.5-2.7
- Long : Short Axis 2.8-3.0
- Long : Short Axis 3.1-3.3
- Long : Short Axis 3.4-3.6

The results from this first linear associator were send through to another linear associator. Since much of the data had already been processed with error correction from the first linear associator, I left out any sort of error correction system in the second linear associator, using a model like that found in homework two. This second linear associator predicted the required action to be taken with reasonably high accuracy.

Name	PLANET OF ORIGIN	Warp Drive Vibration Index	Hailing Transp. Frequency	Surface Reflectivity	Ratio of Short / Long	REQUIRED ACTION
_____	Romulan	7.3	____	Light Gray	2.1	Alert
_____	Federation	5.6	1355.0	White	2.1	Friendly
T11___	Federation	5.7	1345.0	White	__	Friendly
_____	Federation	__	1355.0	Light Color	__	Friendly
T11__Y	Klingon	7.0	1305.3	Dark Color	__	Hostile
_____	Romulan	7.3	951.4	Green	1.9	Alert
Kvotov	Klingon	7.0	1301.8	Light Gray	1.0	Hostile
Hoshi	Romulan	__	971.7	Blue	1.7	Alert
Krilop	Romulan	7.2	____	Dark Gray	2.9	Alert
C06__	Antaresan	5.7	____	Orange	__	Friendly
_____	Romulan	__	____	Black	2.5	Alert
G__-k	Klingon	5.9	>1000	Black / Dark	3.2	Hostile
_9e__	Romulan	5.6	____	Light Blue	1.2	Alert
_6___	Antaresan	5.6	____	Orange	__	Friendly
Tosh__	Romulan	__	955.8	Light Blue	__	Alert
Sor___	Antaresan	7.7	<1000	_____	__	Friendly
3____	Antaresan	5.8	1313.3	Light Color	1.0	Friendly
R4511	Antaresan	__	____	_____	__	Friendly
_____	Antaresan	__	>1000	Light Color	1.7	Friendly
Mor___	Federation	5.7	1355.0	_____	__	Friendly