

### Complex functions in the real world

Are such complex functions seen in most real world examples?

1. Consider predicting whether the Annual Income of person  $\geq 50k$  or  $< 50k$

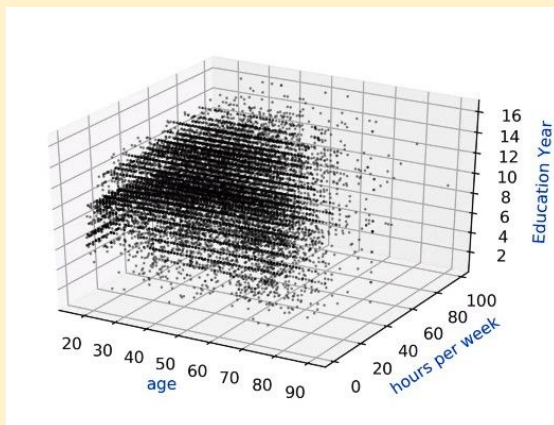
Age	hour/week	Education year
90	40	9
54	40	4
74	20	16
45	35	16

.....  
More features

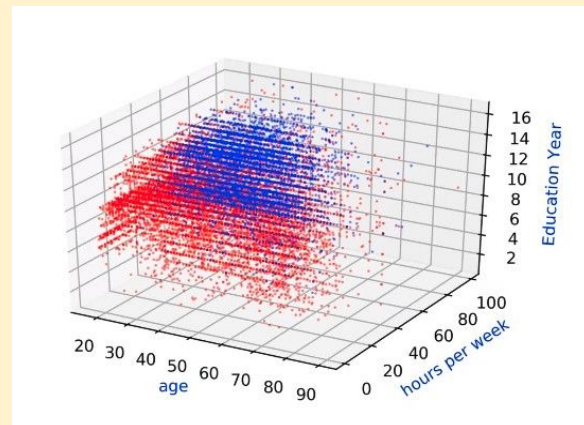
Income
0
0
1
1

2. Plotting the data would give us a plot like so

Non Separated



Coloured for +ve and -ve



3.  $\hat{y} = \hat{f}(x_1, x_2, x_3, \dots, x_n)$  or  $\text{income} = \hat{f}(\text{age}, \text{hour}, \dots, \text{education})$

4. Consider predicting whether the person need to be diagnosed with a liver ailment or not

Age	Albumin	T_Bilirubin
65	3.3	0.7
62	3.2	10.9
20	4	1.1
84	3.2	0.7

.....  
More features

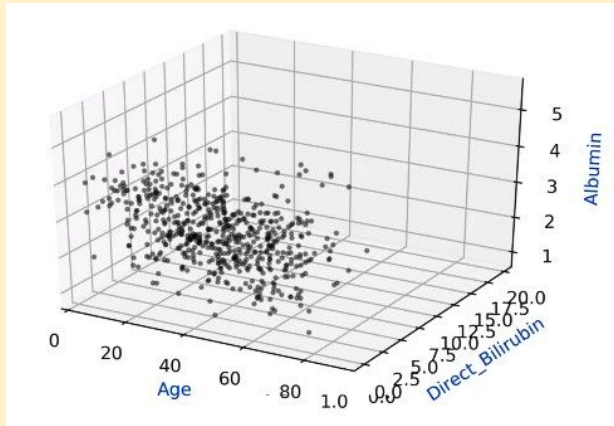
Diagnosis
0
0
1
1

# PadhAI: Representation Power of Functions

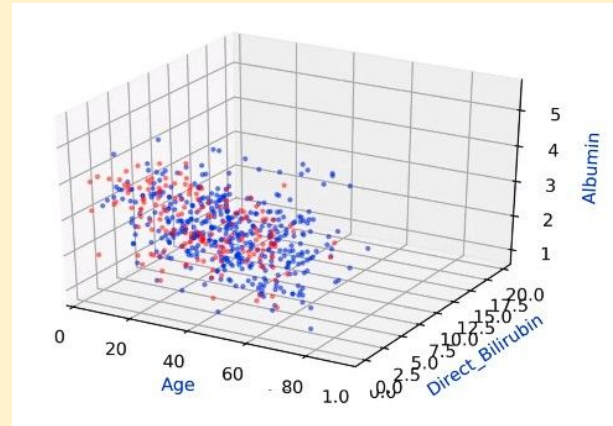
## One Fourth Labs

5. Plotting the data gives us

**Non Separated**



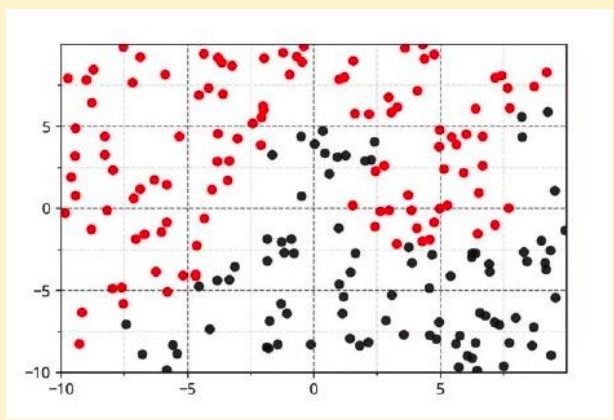
**Coloured for +ve and -ve**



6.  $\hat{y} = \hat{f}(x_1, x_2, x_3, \dots, x_n)$  or *disease* =  $\hat{f}(\text{age}, \text{albumin}, \dots, \text{direct-bilirubin})$

7. Here are a few more examples of complex decision boundaries

**Non Separated**



**Separated**

