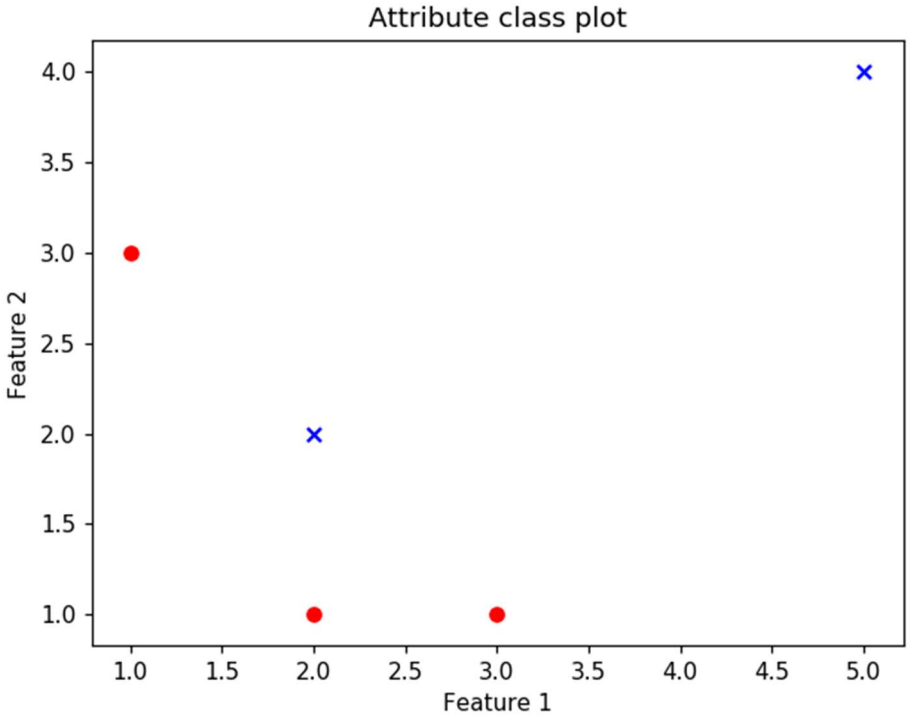
TPC4

1.

a)



Given that the red circules are a=0 and blue crosses a=1, we can verify that this data is not linearly separable, because is not possible to "draw" a line that separate the data by feature.

b) Using the following gradient formula as role model:

$$\frac{\partial \log L(\mathcal{D})}{\partial \beta_0} = \sum_{n=1}^{N} (\pi(1 \mid x_n) - a_n)$$

$$\frac{\partial \log L(\mathcal{D})}{\partial \beta_1} = \sum_{n=1}^{N} x_n(\pi(1 \mid x_n) - a_n)$$

For the first weight beta0 = 0, we calculate the first gradient wich gave a value of 0.5 and its corresponding new weight (using gradient descent): -0.5. We used the top formula from above, because this weight doens't depends on any atribute.

For the second and third weight, beta1=0, beta2=0, we also calculate the gradient wich gives value of -0.5 each and its corresponding new weights (using gradient descent) 0.5 each. We used the bottom formula from above, because this weights depends on its attributes.

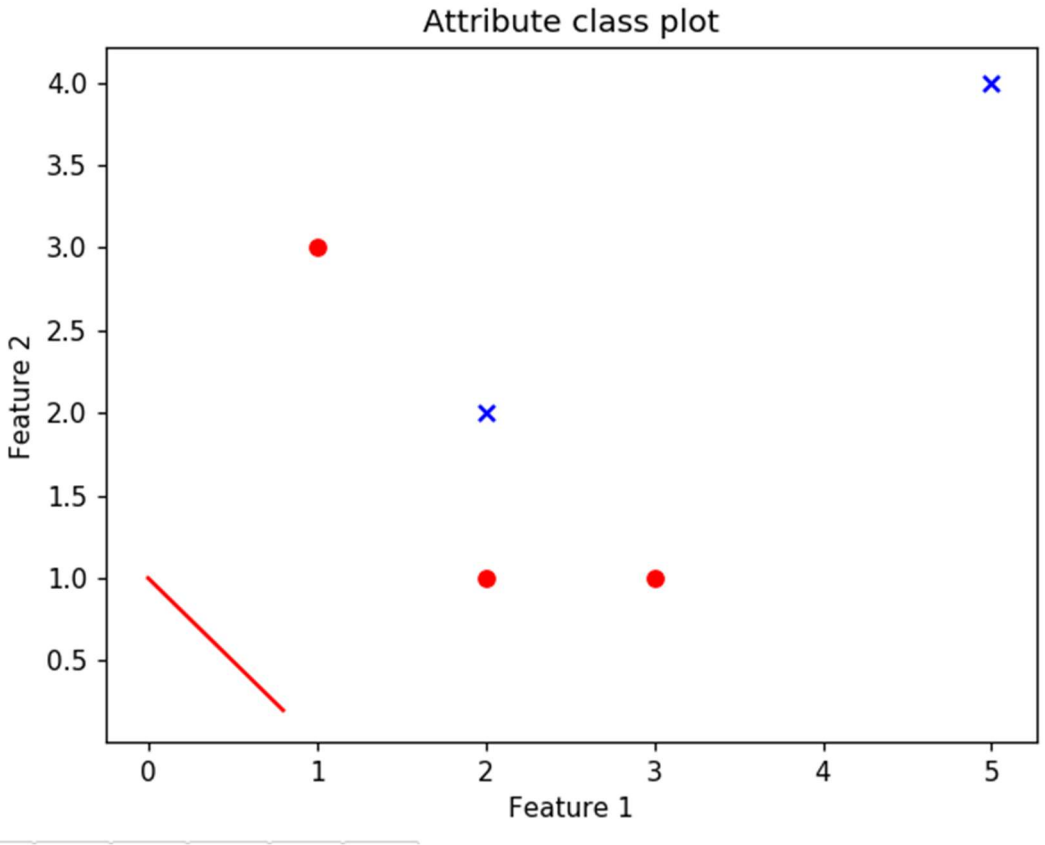
Giving the following recalculated weights:

Beta0=-0.5

Beta1=0.5

Beta2=0.5

c)



We can verify, that it does not properly classify tha data.

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