SuperAGI Assignment

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Question 1
$w_{new_0} = w_{old_0}$
$w_{new_1} = w_{old_1}$
.
.
.
$w_{new_n} = w_{old_n}$
$w_{new_{n+1}} = 0$
The weight corresponding to the last attribute will be 0 since it is redundant.

Question 2.
(a.) We have too little data as variance needs to be provided to know the spread of the distributions for a t-test.

Question 3.
It's the cost of the following update:

$$w^{t+1} \leftarrow w^t + \sum_i^m (y_i - \sigma(x_i))x_i \tag{1}$$

where m is the number of examples and $\sigma(x_i)$ is the value of the sigmoid function.
Cost of $(y_i - \sigma(x_i))$ is $O(n)$ for the n subtractions.
Cost of $(y_i - \sigma(x_i)) * x_i$ is $O(n)$ for the multiplications. Cost of $\sum_{i=1}^{m}(y_i - h(x_i)) * x_i$ involves $O(m)$ additions, each with cost $O(n)$. Therefore, overall $O(mn)$.

Total cost is $O(mn + n) = O(mn)$. The effective cost due to sparsity is $O(km + k)$.