$((x,y), 1)$

$((x,y), 0)$

Non-Parametric Way:

We can use KNN (K-Nearest Neighbour) to classify if the point lies in half space or not. KNN algorithm will classify a given point by checking the classification of K nearest neighbours.

Correct Answer: To classify point 'X' in the given graph, we find the nearest K neighbours (lets say k=3) A, B and C. We classify point 'X' as $((x,y),1)$ as the majority KNN are classified as $((x,y),1)$ and it gives us the correct answer as it is correctly classified above the correct line 'l'.

Incorrect Answer: The KNN algorithm will classify point 'G' as $((x,y),0)$ as the K nearest neighbours are D, E and F although it should have classified as $((x,y),1)$ as it is above the line 'l'.

Parametric Approach :

For parametric approach, we have to come up with an equation which can be tuned based on the given data set. In this case, the equation will be the equation of a line i.e., $y = mx + c$. We have to find the values of m and c such that it correctly classifies the data points. Let say, our values of m and c came out to be 1.1 and 2.3 respectively. If we store the values of m and c as 1 and 2 respectively due to shortage of bits for the used datatype, then our model may result in errors as we may misclassify certain data points as the line itself is changed now because of the way the slope and y-intercept are stored.