Let us define an optimal solution $O = \{L_{x1}, L_{x2}, L_{x3}, . . ., L_{xn}\}$ and the greedy algorithm solution $G = \{L_{y1}, L_{y2}, L_{y3}, . . ., L_{ym}\}$. Assuming that these two solutions are not the same, this means that there are either elements in O that might not be in G, or elements in G that might not be in O and hence the magnitude of O and G might be different or there are elements in G in a different magnitude than O but this is not possible as we will have an equal number of colored sticks in both solutions.
The other difference between O and G might be in the order of the sticks. Lets suppose we had the red set: {2, 7}, and the blue set: {7, 9}. The optimal solution O might be {{2,9},{7,7}} where the average length difference is 7/2 = 3.5. Our greedy solution G will be {{2,7},{7,9}}, where the average length difference is (5+2)/2 = 3.5. Therefore both solutions are valid and optimal.