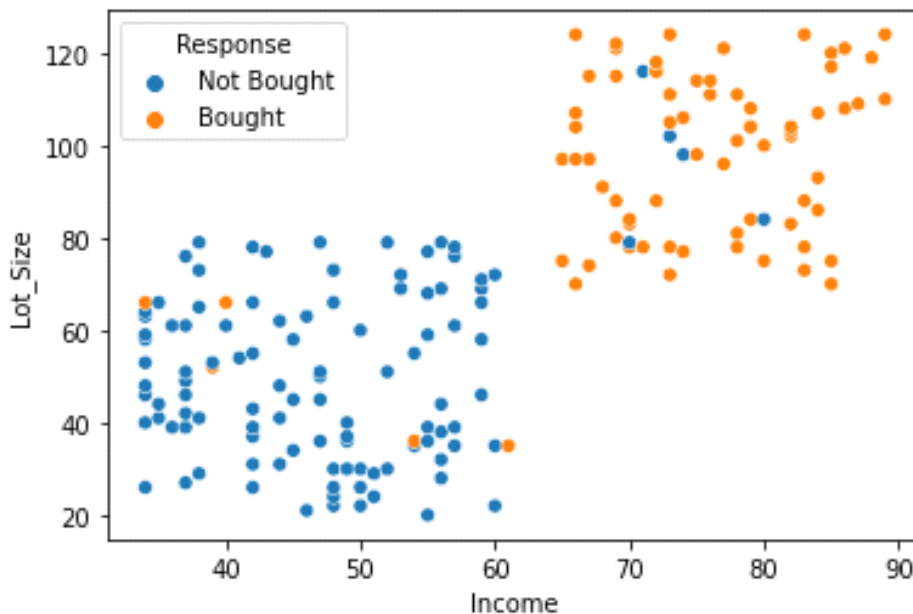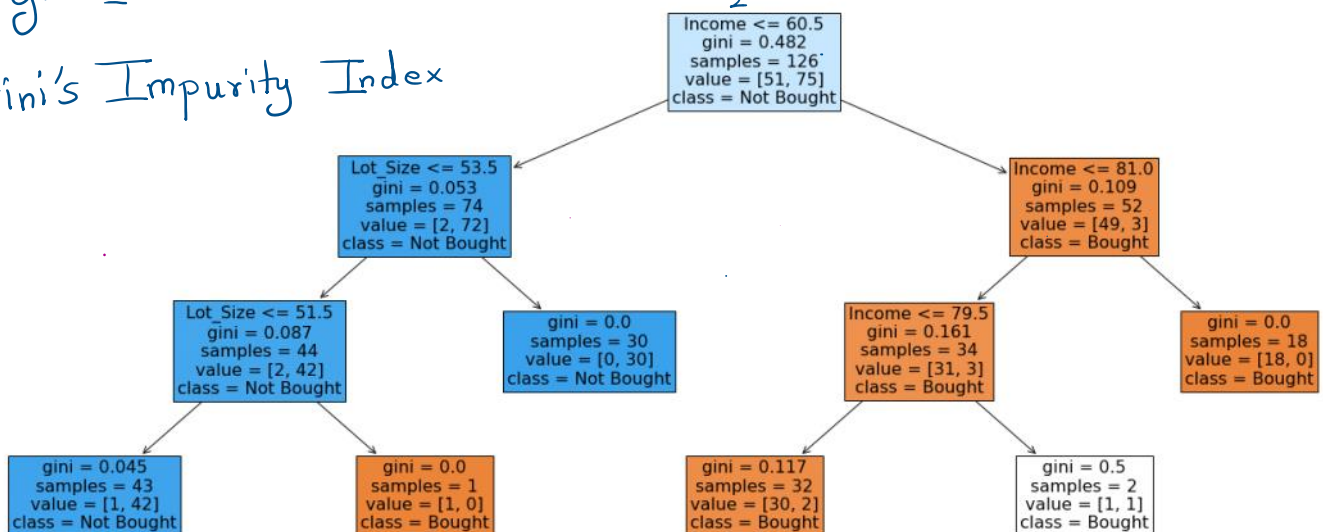# Classification Example: Riding Mowers

- A riding-mower manufacturer **MOW-EASE** took part in a Industrial Exhibition in which it got an opportunity to show a demo of its product to 180 different audience.
- The land owned by each of the audience and their approximate income have been recorded in the file RidingMowers.csv

$$gini = f_1(1-f_1) + f_2(1-f_2)$$

$$f_1 = \frac{51}{126} \quad f_2 = \frac{75}{126}$$

Gini's Impurity Index

	Income <= 60.5 gini = 0.482 samples = 126 value = [51, 75] class = Not Bought	

Decision tree:

- Income <= 60.5, gini = 0.482, samples = 126, value = [51, 75], class = Not Bought
  - Lot_Size <= 53.5, gini = 0.053, samples = 74, value = [2, 72], class = Not Bought
    - Lot_Size <= 51.5, gini = 0.087, samples = 44, value = [2, 42], class = Not Bought
      - gini = 0.045, samples = 43, value = [1, 42], class = Not Bought
      - gini = 0.0, samples = 1, value = [1, 0], class = Bought
    - gini = 0.0, samples = 30, value = [0, 30], class = Not Bought
  - Income <= 81.0, gini = 0.109, samples = 52, value = [49, 3], class = Bought
    - Income <= 79.5, gini = 0.161, samples = 34, value = [31, 3], class = Bought
      - gini = 0.117, samples = 32, value = [30, 2], class = Bought
      - gini = 0.5, samples = 2, value = [1, 1], class = Bought
    - gini = 0.0, samples = 18, value = [18, 0], class = Bought

I   Ls
70   78

	Income	Lot_Size
NB 27	38	79

$$\frac{1}{70} \quad \frac{25}{78}$$

	Income	Lot_Size
NB 27	38	79
NB 89	56	38
NB 9	34	66