Module 9 Self Check

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1 Probabilities

1.1 Safe?

P(Safe = Yes) = 7/15 = 0.467
P(Safe = No) = 8/15 = 0.533

1.2 Shape

P(Shape = Round & Safe = Yes) = 4/7 = 0.571
P(Shape = Round & Safe = No) = 3/7 = 0.429
P(Shape = Square & Safe = Yes) = 3/8 = 0.375
P(Shape = Square & Safe = No) = 5/8 = 0.625

1.3 Size

P(Size = Large & Safe = Yes) = 6/8 = 0.75
P(Size = Large & Safe = No) = 2/8 = 0.25
P(Size = Small & Safe = Yes) = 1/7 = 0.143
P(Size = Small & Safe = No) = 6/7 = 0.857

1.4 Color

P(Color = Blue & Safe = Yes) = 0/3 = 0
P(Color = Blue & Safe = No) = 3/3 = 1
P(Color = Green & Safe = Yes) = 4/6 = 0.667
P(Color = Green & Safe = No) = 2/6 = 0.333
P(Color = Red & Safe = Yes) = 3/6 = 0.5
P(Color = Red & Safe = No) = 3/6 = 0.5

2 Normalized Probability Example

P(Safe = Yes & Shape = square & Size = large & Color = red) =
$\frac{P(Safe=Yes)*(Shape=square\&Safe=Yes)*P(Size=large\&Safe=Yes)*P(Color=red\&Safe=Yes)}{P(Shape=square\&Size=Large\&Color=Red)} =$
$0.467 * 0.375 * 0.75 * 0.5 = 0.066$
P(Safe = No & Shape = square & Size = large & Color = red) =
$\frac{P(Safe=No)*(Shape=square\&Safe=No)*P(Size=large\&Safe=No)*P(Color=red\&Safe=No)}{P(Shape=square\&Size=Large\&Color=Red)}$
$0.533 * 0.625 * 0.25 * 0.5 = 0.0415$
P(Safe = Yes & Shape = square & Size = large & Color = red) = $\frac{0.066}{0.066+0.0415} = 0.612$
P(Safe = No & Shape = square & Size = large & Color = red) = $\frac{0.0415}{0.066+0.0415} = 0.388$