1. The bias variance tradeoff is the problem of trying to minimize both bias and variance, while increasing one can decrease the other. Bias can be reduced by increasing complexity, while variance can be reduced by resampling the data.

2.

$$\text{Precision} = \frac{TP}{TP+FP}$$

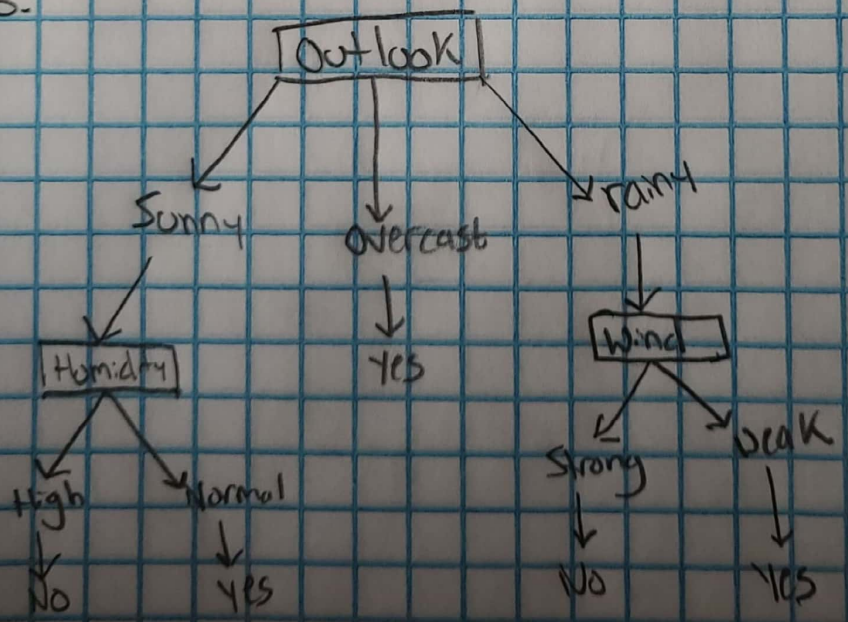
		Pred class1	Pred class2
Actual	class1	60	30
	class2	40	60

$$= \frac{60}{60+30} = .67$$

$$\text{recall} = \frac{TP}{TP+FN} = \frac{60}{60+40} = .6$$

$$F_1 = \frac{2}{1/P + 1/R} = \frac{2}{1/2/3 + 1/3/5} = \frac{2}{3/2 + 5/3} = .632$$

3.



4 1 1 2

Class 1

$P(1,1) = 4/7$

$P(2,1) = 1/2$

$P(3,2) = 0$

0

class 2

$P(1,1) = 3/7$

$P(2,1) = 1/2$

$P(3,2) = 1$

.21

class 2