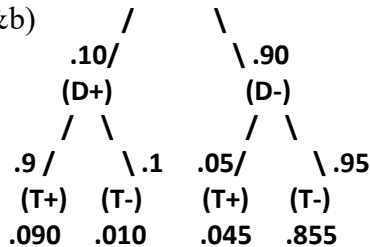


**Exam 1 MPS Spring 2018**

- 1a) The mean is less than the median (skewed negative)  
 1b) Right Fence =  $79 + (1.5)(10) = 94$  Yes, 99 is a possible outlier  
 1c) 25% (third quartile)
- 2) a)  $\mu = (10)(.65) = 6.5$       b)  $P(X \geq 9) = 0.086$  (add up binomial values from 9 to 10)
- 3) a)  $149 \pm (1)21 = 128$  to 170 grams  
 b)  $120 \pm (3)13 = 81$  to 159 grams  
 c) 0.92    d) -0.81    e) Apple is more unusual, z-score further from zero
- 4a) i)  $700/2000 = 0.35$     ii)  $150/2000 = 0.075$     iii)  $150/500 = 0.30$   
 4b) Yes, Independent       $P(\text{Juice}) = .20$        $P(\text{Juice}|\text{Stanford}) = .20$  they are equal  
 4c) No, Not Independent       $P(\text{Coffee}) = .35$        $P(\text{Coffee}|\text{Stanford}) = .30$  they are not equal

5a&b)

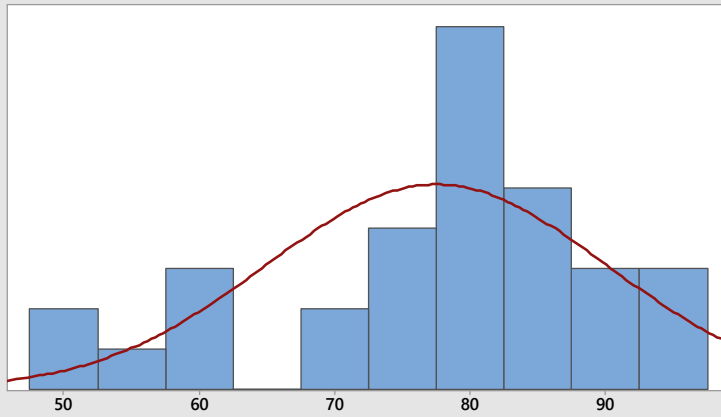


	Test+	Test-	Total
<b>Diabetes</b>	<b>90</b>	<b>45</b>	<b>135</b>
<b>No Diabetes</b>	<b>10</b>	<b>855</b>	<b>865</b>
<b>Total</b>	<b>100</b>	<b>900</b>	<b>1000</b>

- 5c)  $90/135 = 0.667$
- 6a)  $P(X < 4) = P(Z < -1.00) = 0.1587$       6b)  $4.8 + 0.67(0.9) = 4.275$  minutes
- 6c)  $P(\bar{X} > 5) = P\left(Z > \frac{5 - 4.8}{0.8/\sqrt{30}}\right) = P(Z > 1.37) = 0.0853$  (uses Central Limit Theorem)

- 7) a) Graph E      b) Graph C      c) Graph A      d) Graph D
- 8) a) Is staying up extra late the night before a statistics exam better than getting lots of rest?  
 b) Explanatory: Time to bed (11PM or 2AM)      Response: Exam Score  
 c) Cluster sampling plus random assignment into groups creates representative samples  
 d) 77% was average exam score for 2AM group.  
     81% was average exam score for 11PM group.  
     The researchers decided that this was a significant difference.  
 e) The researchers concluded there was evidence that getting lots of rest the night before a statistics exam was better for student exam scores.

## Summary Report for E1 MPS



### Anderson-Darling Normality Test

A-Squared 0.83  
P-Value 0.028

Mean 77.500  
StDev 12.567  
Variance 157.935  
Skewness -0.721661  
Kurtosis 0.026867  
N 32

Minimum 49.000  
1st Quartile 72.250  
Median 79.500  
3rd Quartile 84.750  
Maximum 97.000

95% Confidence Interval for Mean  
72.969 82.031

95% Confidence Interval for Median  
76.998 83.000

95% Confidence Interval for StDev  
10.075 16.708

### 95% Confidence Intervals

