Quiz 5 Solutions

1. H is the event hits the free throw $P(H) = .793$
   M is the event he misses the free throwm $P(M) = .207$

A. $S = \{0, 1, 2, 3\}$

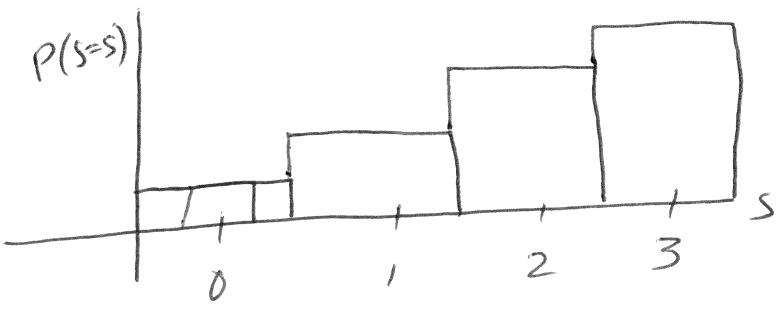
B. $P(S=1) = P(HMM) + P(MHM) + P(MMH) = 3(.793)(.207)^2 \approx .1019$

C. $P(S=0) = P(MMM) = (.207)^3 = .00887$

$P(S=2) = 3\,P(MHH) = 3(.793^2)(.207) \approx .3905$

$P(S=3) = P(HHH) = .793^3 = .4987$

S	0	1	2	3
P(S=s)	.00887	.1019	.3905	.4987



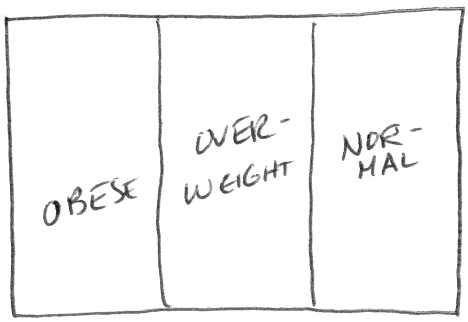
2. G is event the reference is good $P(G) = 1 - P(B) = .87$
   B is event the reference is bad $P(B) = .13$

$P(\text{all 6 are good}) = (.87)^6 = .4336$ OR 43.36%

Note we are assuming that the events are independent which is a valid assumption.

$P(OB) = 0.36$ $P(OW) = .33$ $P(N) = .31$

3.



A. There is no overlap. One cannot be in both groups.

B. see below

C. $P(OB \text{ OR } OW) = .36 + .33 = .69$

C. Above

OB is event person is obese, OW is event person is overweight, N is event person's weight is normal

4. A. When add up the probabilities you get one. So this shows that there are no students who are taking 2 languages.

B. $P(Sp \text{ OR } F \text{ OR } G \text{ OR } M) = .29 + .12 + .06 + .09 = .56$

C. $P(F \text{ OR } G \text{ OR } M) = .12 + .06 + .09 = .27$

5. A. normalcdf (50, 57, 61, 9) = .2175 OR 21.75% of runners run the race between 50 and 57 mins.

B. normalcdf (75, 1000, 61, 9) = .0599 OR 5.99% run race in greater than 75 minutes.

C. $\frac{65-61}{9} \approx .4444$ time is .4444 standard deviations above the mean.

D. $\frac{50-61}{9} \approx -1.222$ $\frac{57-61}{9} \approx -.4444$

normalcdf (−1.222, −.4444, 0, 1) ≈ .2175

6. A. $P(T \leq 8)$ means the probability the person runs the race in 8 minutes OR less

$P(T \leq 8) = \text{normalcdf}(-100, 8, 7.11, 0.74) \approx .8855$

B. $P(T \geq 7)$ is probability that person could not run a mile in less than 7 minutes

$P(T \geq 7) = \text{normalcdf}(7, 100, 7.11, 0.74) \approx .5591$