**Z-Score Practice**

1. The weights of bags of popcorn are normally distributed with a mean of 200g and 60% of all bags weighing between 190g and 210g.  
   1. Write down the median weight of the bags of popcorn
   2. Find the standard deviation of the weights of the bags
2. The lifetime of bulbs used in a lamp are normally distributed.  
   A Company X sells bulbs with a mean lifetime of 850 hours and a standard deviation of 50 hours.  
   1. Find probability of a bulb, from company X, having a lifetime of less than 830 hours.
   2. In a box of 500 bulbs, from company X, find the expected number having a lifetime of less than 830 hours.

A rival company Y sells bulbs with a mean lifetime of 860 hours and 20% of these bulbs have a lifetime of less than 818 hours.

* 1. Find the standard deviation of the lifetimes of bulbs from company Y.

Compare Company X and Y below. Please also draw an illustration of both to use for your comparison.

1. The heights of a group of athletes are modeled by a normal distribution with a mean of 180 cm and a standard deviation of 5.2 cm. The weights of this group of athletes are modeled by a normal distribution with a mean of 85 kg and a standard deviation of 7.1 kg.   
     
   Find the probability that a randomly chosen athlete,   
   1. Is taller than 188 cm
   2. Weighs less than 97 kg
   3. Assuming that for these athletes height and weight are independent, find the probability that a randomly chosen athlete is taller than 188 cm and weighs more than 97 kg.