

### **Problem Statement**

**A recent national study showed that approximately 44.7% of college students have used Wikipedia as a source in at least one of their term papers. Let X equal the number of students in a random sample of size  $n = 31$  who have used Wikipedia as a source.**

**a. Find the probability that X is equal to 17**

**Answer :**

`dbinom(17, 31, 0.447)`

**b. Find the probability that X is at most 13**

`pbinom(13, 31, 0.447)`

**c. Find the probability that X is bigger than 11.**

`pbinom(11, 31, 0.447, lower.tail = F)`

**d. Find the probability that X is at least 15.**

`pbinom(14, 31, 0.447, lower.tail = F)`

**e. Find the probability that X is between 16 and 19, inclusive**

`sum(dbinom(16:19, 31, 0.447))`

`diff(pbinom(c(19,15), 31, 0.447, lower.tail = FALSE))`

**a) 0.07532248 is the probability that x is equal to 17**

**b) 0.451357 is the probability that x is at most 13**

**c) 0.8020339 is the probability that x is bigger than 11**

**d) 0.406024 is the probability that x is at least 15**

**e) 0.2544758 is the probability between 16 and 19 , inclusive**