ANLY511 Lab1 Assignment

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Problem 1

(This relates to Example 1 in Lab 1)

Mike had the first three successes in trials 6, 8, and 9. He had six failures until he reached three successes. Do you think Mike has *success probability p = 0.5 or better?* Can a simulation give an answer?Let's try.

1. simulate the number of tosses needed to get to three successes, use the success probability p = 0.5. (Hint: use the "myattempts" function we did in the Lab class)
2. Run many simulations (say 10,000) with this success probability to find the number of failures untill first three successes. (use the "myattempts" function from the class)
3. If Mike's success probability were 0.5 or better, he would not need a lot of attempts. Find the fraction of simulations where three successes were reached after 9 tosses or later by somebody with success probability 0.5. *(Hint: Here the number of failures until first 3 successe will be 6. Why?)*

Problem 2: Baby names for male and female babies.

Repeat Example 2 (in the lab 1) using "yob2010.txt". Interpret your results (in wording relates to the problem) for each simulation step by step.

Problem 3

Problem 1.5 in ch. 1 of Dalgaard. On p. 27, replicate was used to simulate the distribution of the mean of 20 random numbers from the exponential distribution by repeating the operation 10 times. That code is

```
replicate(10,mean(rexp(20)))
```

```
##  [1] 1.2242664 1.1214261 0.6187910 1.4600313 1.2657631 1.1940755 1.0587216
##  [8] 1.3593367 0.9849188 0.8031113
```

How would you do the same thing with sapply?