Discussion 7

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Chapter 6 Question 8

A royal family has children until it has a boy or until it has three children, whichever comes first. Assume that each child is a boy with probability 1/2. Find the expected number of boys in this royal family and the expected number of girls.

```
#Number of Boys -> X
#All 3 children are girls
p_x_0 <- (.5)^3

#1 Boy
p_x_1 <- 1 - p_x_0

#Expected number of boys
answer_1 <- 0*p_x_0 + 1 * p_x_1
answer_1
```

```
## [1] 0.875
```

```
#Number of girls -> X1

p_1_boy <- 0.5

#1 Girl 1 Boy
p_1g_1b <- 0.5^2

#2 Girl 1 Boy
p_2g_1b <- 0.5^3

#3 Girls
p_3g <- 0.5^3

#Expected Girls
answer_2 <- (0*p_1_boy)+(1*p_1g_1b)+(2*p_2g_1b)+(3*p_3g)
answer_2
```

```
## [1] 0.875
```