HW1

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2023-10-05

Problem 1: Suppose X is a geometric random variable with $p = 0.3$, determine the value of k such that $P(X \leq k) \simeq 0.8$

$$X \sim Geometric(0.3)$$
$$P(X \leq k) = 1 - (1-p)^k \simeq 0.8$$
$$1 - 0.7^k \simeq 0.8$$
$$0.7^k \simeq 0.2$$
$$k = \frac{log(0.2)}{log(0.7)}$$

```
print(paste("k =",log(0.2)/log(0.7)))
```

```
## [1] "k = 4.51233802593815"
```

Problem 2: If two random variables, X and Y, are independent, show Var(XY) in terms of the expected values and variances of X and Y.