

Q: The probability that a person is not a swimmer is 0.3. The probability that out of 5 persons 4 are swimmers is

Solution: Here, probability that out of 5 persons 4 are swimmers is

Parameter	Values	Description
n	5	Number of draws
p	0.3	Probability that person is not a swimmer
q	0.7	Probability that person is a swimmer
μ	3.5	Mean
σ	1.024	Variance
X	0	Swimmer
	1	Not a swimmer
Y	$\sum_{i=1}^n X_i$	Binomial Random Variable

$$\Pr(Y = 4) = \Pr(3.5 < Y < 4.5) \quad (1)$$

$$= \int_0^{0.976} \frac{1}{\sqrt{2\pi}} \times e^{-\frac{x^2}{2}} dx \quad (2)$$

$$(3)$$

$$= 0.335 \quad (4)$$

$$\Pr(Y = 4) = p_Y(4) \quad (5)$$

$$= {}^nC_k p^k (1 - p)^{n-k} \quad (6)$$

$$= 0.360 \quad (7)$$

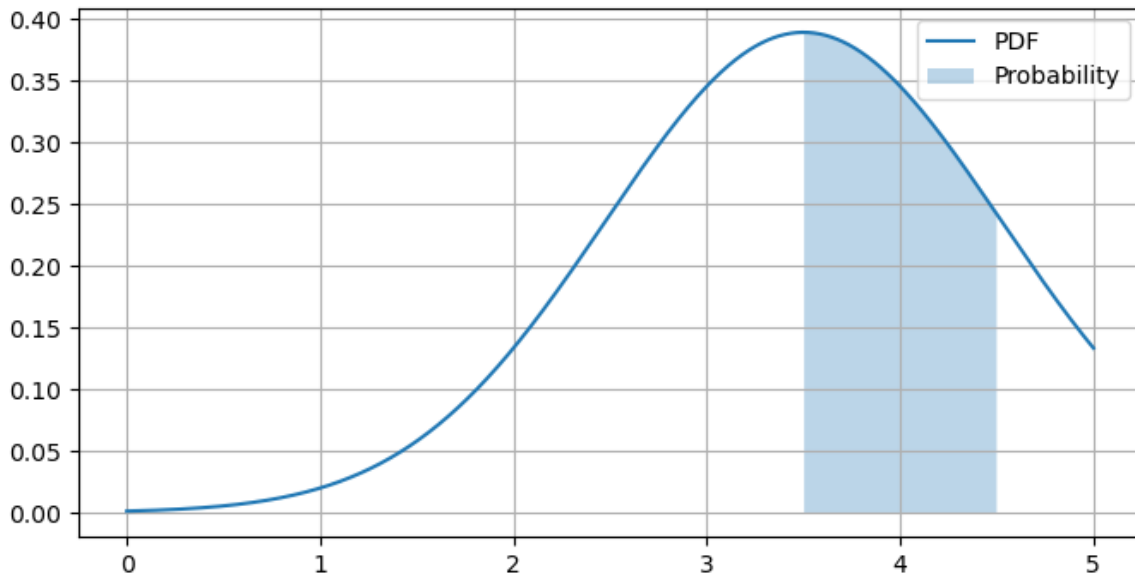


Fig. 0. PDF for 4 out of 5 Persons Being Swimmers (Gaussian Approximation)

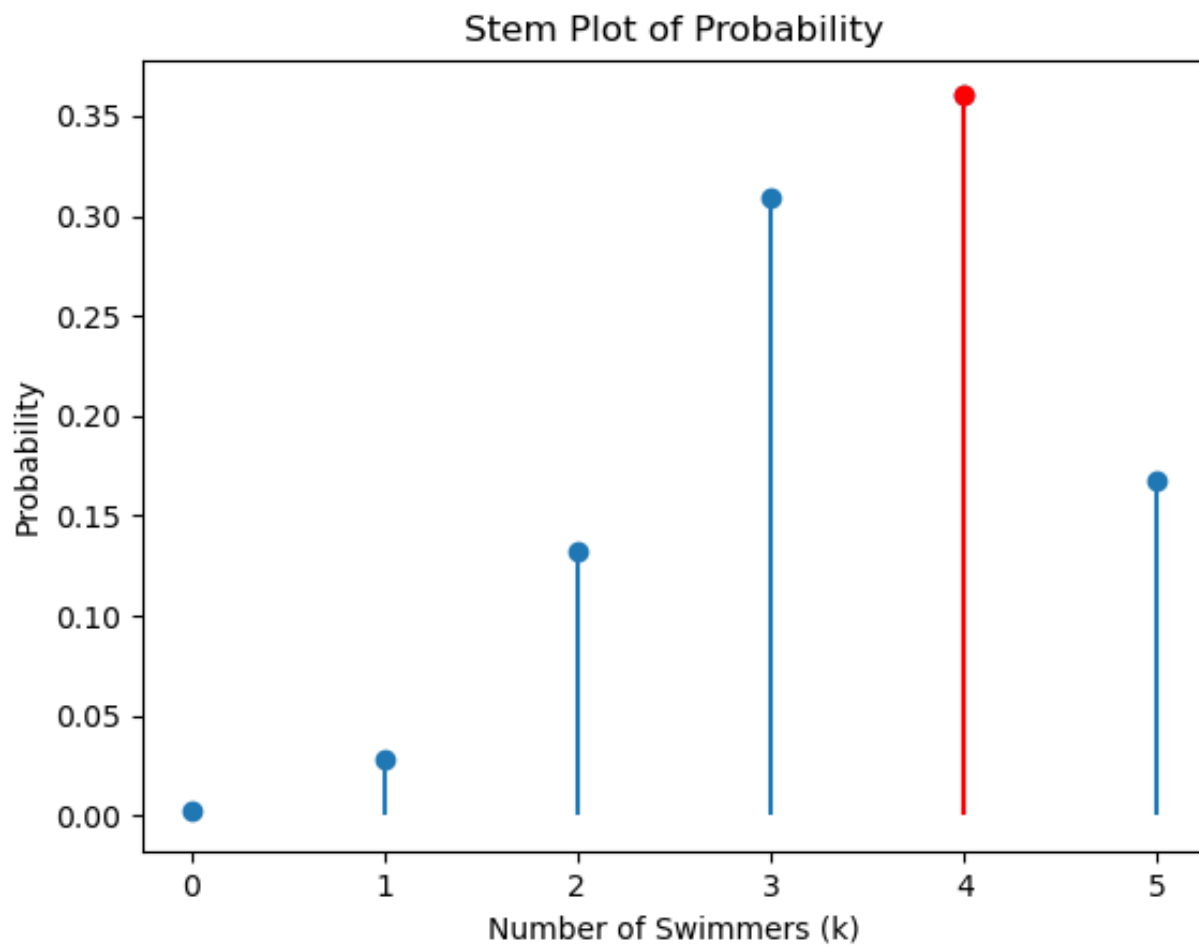


Fig. 0. PDF for 4 out of 5 Persons Being Swimmers (Binomial)