Negative Binomial Distribution

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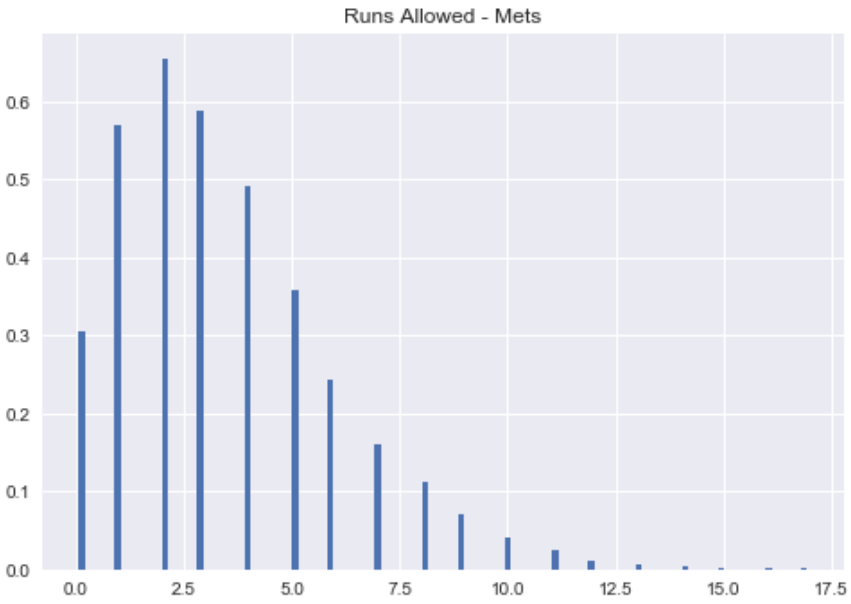
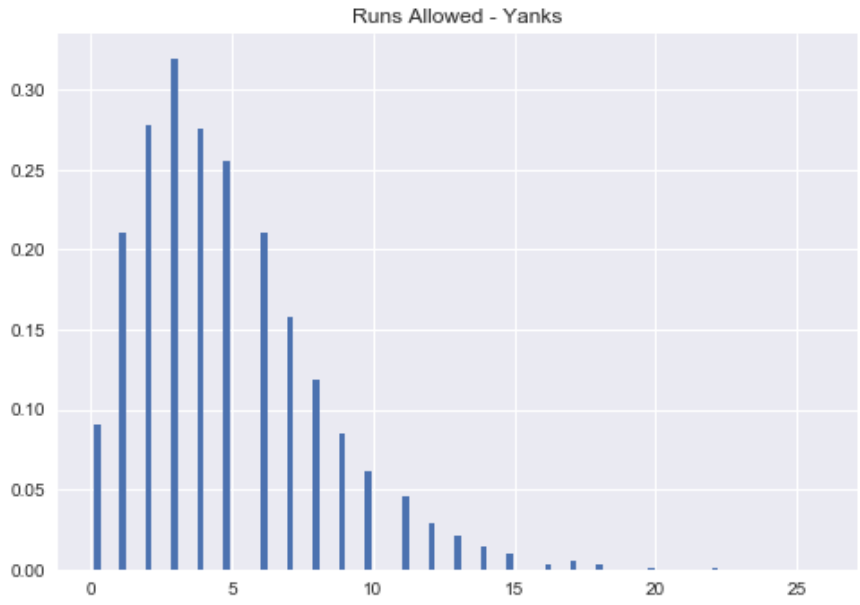
Syracuse University

Simulating Runs Allowed





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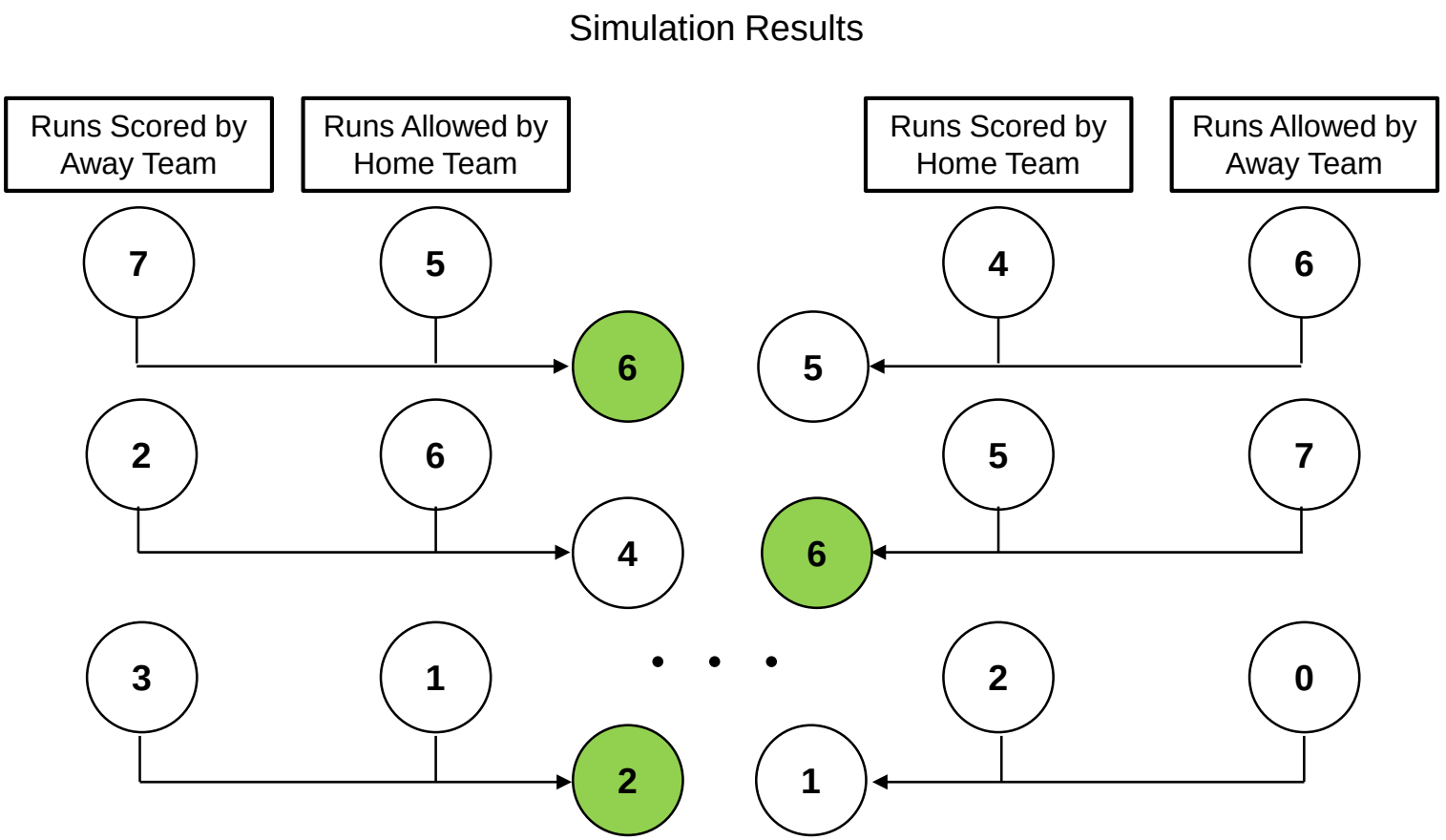
Sports Simulation

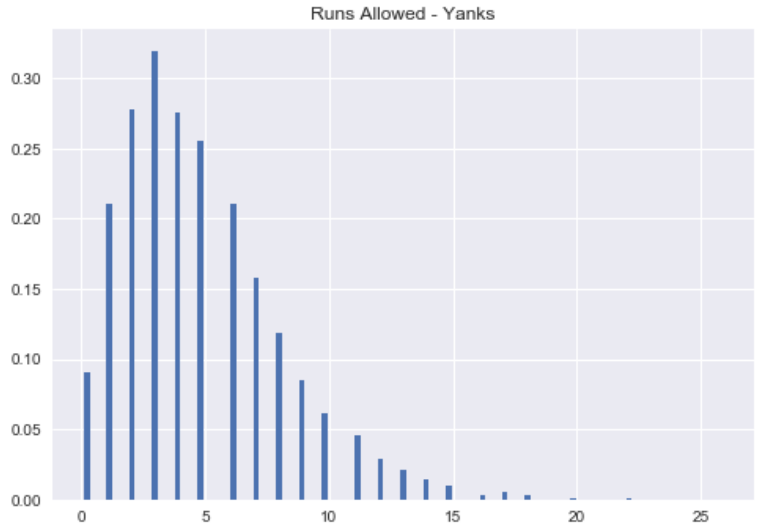


Source: Adapted from Miller (2005).

Negative Binomial

- Alternative approximation for count responses

$$P(Z = z) = \binom{z-1}{k-1} p^k (1-p)^{z-k}$$



- Generalization of Poisson distribution
- Rare event problems

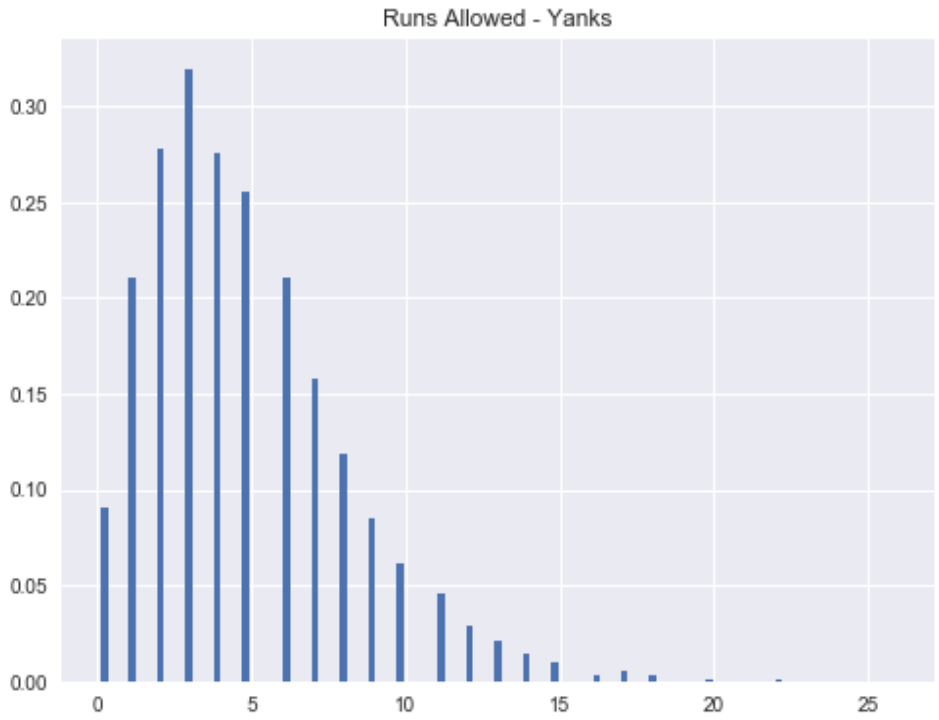
Negative Binomial

- Alternative approximation for count responses

$$P(Z = z) = \binom{z-1}{k-1} p^k (1-p)^{z-k}$$

- Generalization of Poisson distribution

- Rare event problems



Negative Binomial (cont.)

```
MetAwayScore =
np.random.negative_binomial(4, mas, 10000)
MetAwayDefend =
np.random.negative_binomial(4, mad, 10000)
YankHomeScore =
np.random.negative_binomial(4, yhs, 10000)
YankHomeDefend =
np.random.negative_binomial(4, yhd, 10000)

plt.hist(MetAwayScore, bins='auto', rwidth = .5,
normed=True)
plt.title("Runs Scored – Mets")
plt.show()
```