Probability Models

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Probability Models

1) Consider an *urn* model with r **R** balls and g **G** balls.

- Describe the random variables having the following probability models.
- Specify the parameters of the models in terms of the *urn* model.
- Give the **R** function used to generate random numbers from each probability model.

a) $X \sim Bernoulli(p)$
b) $X \sim Binomial(n, p)$
c) $X \sim Geometric(p)$
d) $X \sim NegativeBinomial(r, p)$
e) $X \sim Hypergeometric(r, n, m)$
f) $X \sim Poisson(\lambda)$

2) For each of the following continuous probability models:

- Sketch pictures of the models using different parameter values.
- Write down the formulas for the expected values and variances of each probability model.
- Give an example of a random variable that could be modeled using each probability model.

a) $X \sim Uniform(a, b)$
b) $X \sim Normal(\mu, \sigma^2)$
c) $X \sim Exponential(\lambda)$
d) $X \sim Gamma(\alpha, \beta)$
e) $X \sim Weibull(\alpha, \beta)$