# Geometric Distribution

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# Outline

1. Geometric Distribution
    - Based on
    - Geometric Random Variables
    - Cumulative Distributive Function
    - Quantile function
    - Geometric expectation

# Based on

"Probability with R: An Introduction with Computer Science Applications"
Jane Horgan

# Calculating geometric pdfs

```
dgeom (x=4, prob=.03)
dgeom (4, .03)

x <- 0:4
dgeom(x, .9)
round( dgeom(x, .95), 4)
```

# Plotting geometric pdfs

```
par (mfrow = c(2,2))

x<-0:4
plot(x+1, dgeom(x, prob=.95),
     xlab="X= number of trials", ylab="P(X=x)",
     type="h", main="p=.95");

x<-0:9
plot(x+1, dgeom(x, prob=.5),
     xlab="X= number of trials", ylab="P(X=x)",
     type="h", main="p=.5");

x<-0:4
plot(x+1, dgeom(x, prob=.2),
     xlab="X= number of trials", ylab="P(X=x)",
     type="h", main="p=.2");

x<-0:4
plot(x+1, dgeom(x, prob=.01),
     xlab="X= number of trials", ylab="P(X=x)",
     type="h", main="p=.01");
```

# Calculating geometric cdfs

```
pgeom(4, .03)

x<- 0:4
prob <- pgeom(x, .9)
round(prob, 4)


x<- 0:5
round(pgeom(x, .2), 4)
```

# Plotting geometric cdfs

```
par (mfrow = c(2,2))

x<-0:4
plot(x+1, pgeom(x, prob=.95),
     xlab="X= number of trials", ylab="P(X<=x)",
     type="h", main="p=.95");

x<-0:9
plot(x+1, pgeom(x, prob=.5),
     xlab="X= number of trials", ylab="P(X<=x)",
     type="h", main="p=.5");

x<-0:4
plot(x+1, pgeom(x, prob=.2),
     xlab="X= number of trials", ylab="P(X<=x)",
     type="h", main="p=.2");

x<-0:4
plot(x+1, pgeom(x, prob=.01),
     xlab="X= number of trials", ylab="P(X<=x)",
     type="h", main="p=.01");
```

# quantile function

```
qgeom(.75, .2)
```

```
pgeom(6, .2)
```

# Geometric expectation

```
before <- rgeom(40, .2)

first <- before + 1

table(first)

plot(table(first/40, xlab="Number of inspection", ylab=" ")

mean(first)

var(first)

sd(first)

max(first)
```

## OOO

## OOO

# OOO

# OOO

# OOO

# OOO

# OOO