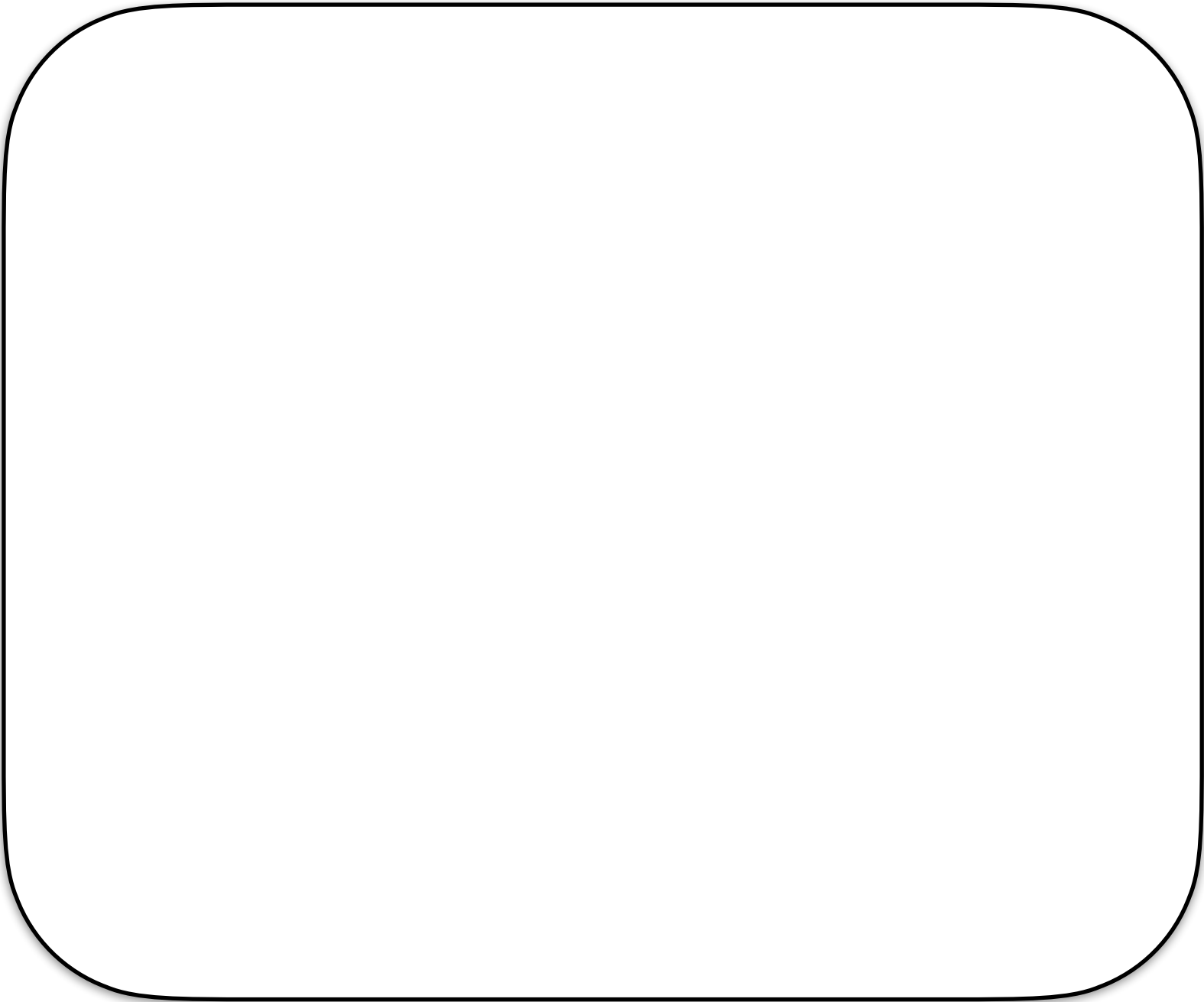


OUR MODEL FROM LAST CLASS



$$y_i \sim \text{Normal}(\mu_i, \sigma)$$

$$\mu_i = \alpha + \beta x_i$$

$$\alpha \sim \text{Normal}(0, 20)$$

$$\beta \sim \text{lognormal}(0, 1)$$

$$\sigma \sim \text{Exponential}(1)$$

```
# Data
```

```
library(rethinking)
```

```
d2 <- Howell1[ Howell1$age >= 18 , ]
```

```
# Model
```

```
ulam(alist(
```

```
  y ~ normal(mu, sigma),
```

```
  mu <- a + b * x,
```

```
  a ~ normal(0, 20),
```

```
  b ~ lognormal(0, 1),
```

```
  sigma ~ exponential(1)),
```

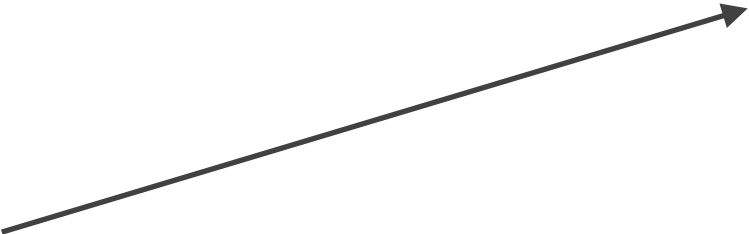
```
  data = list(y = d2$height,  
              x = d2$weight),
```

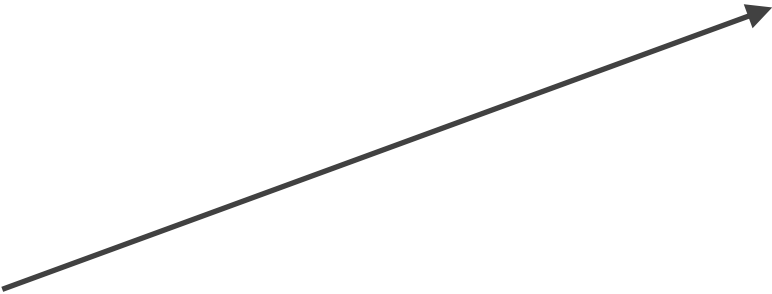
```
  iter = 1000, chains = 4, cores = 4)
```











OUR MODEL FROM LAST CLASS

$$y_i \sim \text{Normal}(\mu_i, \sigma)$$

$$\mu_i = \alpha + \beta x_i$$

$$\alpha \sim \text{Normal}(0, 20)$$

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$$\sigma \sim \text{Exponential}(1)$$

```
# Data
library(rethinking)
d2 <- Howell1[ Howell1$age >= 18 , ]

# Model
ulam(alist(
  y ~ normal(mu, sigma),
  mu <- a + b * x,
  a ~ normal(0, 20),
  b ~ lognormal(0, 1),
  sigma ~ exponential(1),
  data = list(y = d2$height,
              x = d2$weight),
  iter = 1000, chains = 4, cores = 4)
```

RETHINKING GENERATES STAN CODE

```
data{
  vector[352] y;
  vector[352] x;
}
parameters{
  real a;
  real<lower=0> b;
  real<lower=0> sigma;
}
model{
  vector[352] mu;
  sigma ~ exponential( 1 );
  b ~ lognormal( 0 , 1 );
  a ~ normal( 0 , 20 );
  for ( i in 1:352 ) {
    mu[i] = a + b * x[i];
  }
  y ~ normal( mu , sigma );
}
```

Stan

<https://mc-stan.org/>

Stan Dev

<https://github.com/stan-dev/stan>

