Session 3 Live Coding

Bayesian Modeling

```
# Load our libraries
library(tidyverse)
library(rstanarm)
library(bayesplot)
```

```
innovation.df <- read_csv("DSOM5509.csv") %>%
  mutate(myInnovation = ((INN1 + INN2 + INN3) / 3))
```

```
bayesian.model <- stan_lm(SGR ~ myInnovation, data = innovation.df,
                          prior = R2(location = 0.2, what = "mean"),
                          seed = 1, refresh = 0)
```

```
bayesian.model
```

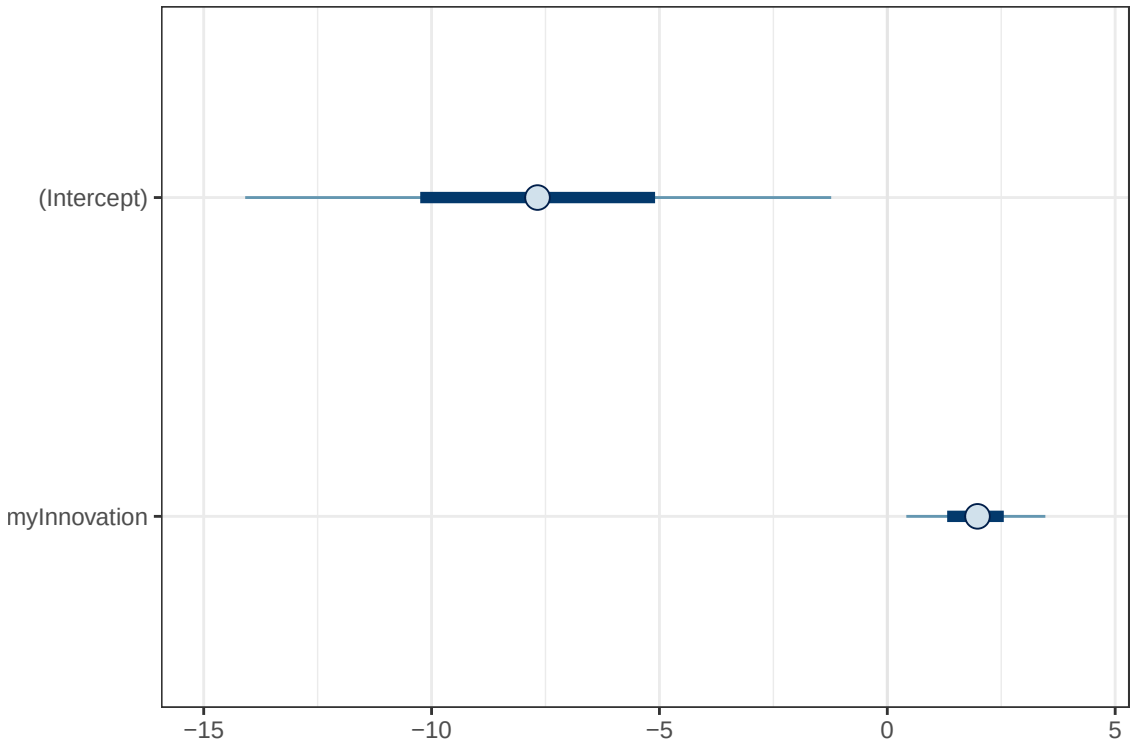
```
## stan_lm
##  family:       gaussian [identity]
##  formula:      SGR ~ myInnovation
##  observations: 114
##  predictors:   2
## ------
##              Median MAD_SD
## (Intercept)  -7.7    3.8
## myInnovation  2.0    0.9
##
## Auxiliary parameter(s):
##               Median MAD_SD
## R2             0.0    0.0
## log-fit_ratio  0.1    0.1
## sigma         14.7    1.0
##
## Sample avg. posterior predictive distribution of y:
##          Median MAD_SD
## mean_PPD 0.0    2.0
##
## ------
## * For help interpreting the printed output see ?print.stanreg
## * For info on the priors used see ?prior_summary.stanreg
```

Create our posterior draws

```
posterior <- as.array(bayesian.model)
```

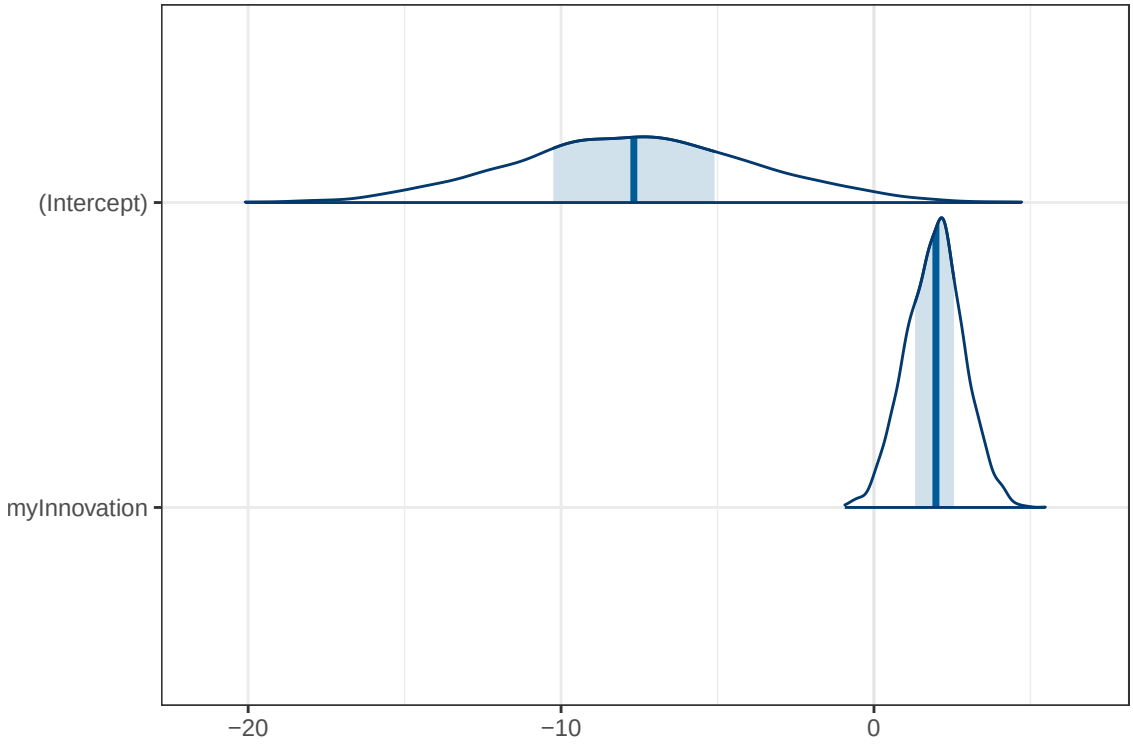
Posterior uncertainty intervals

```
mcmc_intervals(posterior, pars = c("(Intercept)", "myInnovation")) +
  theme_bw()
```



Posterior Area Density

```
mcmc_areas(posterior, pars = c("(Intercept)", "myInnovation")) +
  theme_bw()
```



Posterior Histogram

```
mcmc_hist(posterior, pars = c("(Intercept)", "myInnovation")) +
  theme_bw()
```