My awesome Bayesian project
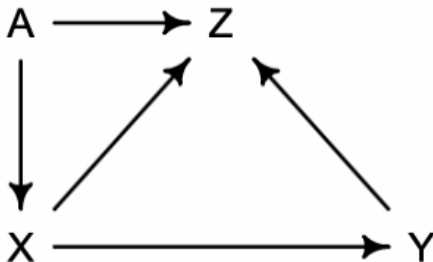
Stanislaw Ulam

Background

- Give a **quick** overview of your awesome project.
- One slide only!

DAG

- ▶ Use `dagitty` to draw your awesome DAG, or take a picture of your DAG and put it here using the code below.
- ▶ Save the image as png and you fiddle with the `out.width` percent below as needed.

Mathematical model

- ▶ Take a picture of your mathematical model and put it here using code similar to the previous slide.

```
#include_graphics("xxx.png")
```

Mathematical model

- Alternatively, you can use latex. Here's one for multilevel cafes:

$$W_i \sim \text{Normal}(\mu_i, \sigma)$$
$$\mu_i = \alpha_{\text{cafe[i]}} + \beta_{\text{cafe[i]}} A_i$$
$$\alpha_{\text{cafe[i]}} \sim \text{Normal}(\alpha, \sigma_\alpha)$$
$$\beta_{\text{cafe[i]}} \sim \text{Normal}(\beta, \sigma_\beta)$$
$$\alpha \sim \text{Normal}(5, 2)$$
$$\beta \sim \text{Normal}(-1, 0.5)$$
$$\sigma, \sigma_\alpha, \sigma_\beta \sim \text{Exponential}(1)$$

Model, in rethinking

```
m14.1 <- ulam(
    alist(
        wait ~ normal( mu , sigma ),
        mu <- a_cafe[cafe] + b_cafe[cafe]*afternoon,
        c(a_cafe,b_cafe)[cafe] ~ multi_normal( c(a,b) ,
                                Rho , sigma_cafe ),
        a ~ normal(5,2),
        b ~ normal(-1,0.5),
        sigma_cafe ~ exponential(1),
        sigma ~ exponential(1),
        Rho ~ lkj_corr(2)
    ) , data=d , chains=4 , cores=4 )
```

Diagnose your chains

- Just one slide, summarize as necessary

Plot the prior and posterior on the same figure

- ▶ Do this for one relevant parameter
- ▶ Here's a different way to embed a png (you can still fiddle with `width`)
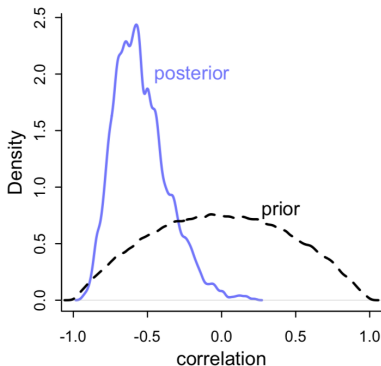
Caterpillar plot of the most important parameters

▶ E.g., the plot you get from using `plot(precis)`

Plot of posterior predictions

- ▶ plot data and model predictions with uncertainty
- ▶ e.g., the plot you get from using `postcheck`

Conclusions

- One slide only!