

# Assignment 8

*Max Wagner*

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## PS1

First I'll add some of the probabilities and nodes for the problem.

```
train.prob <- 20/30
train.ontime <- 0.9
train.late <- .1
bus.prob <- 10/30
bus.ontime <- .5
bus.late <- .5
train.train.ontime <- train.prob * train.ontime
train.train.late <- train.prob * train.late
bus.bus.ontime <- bus.prob * bus.ontime
bus.bus.late <- bus.prob * bus.late
```

And to answer the question...

```
answer <- bus.bus.ontime / (bus.bus.ontime + train.train.ontime);answer
```

```
## [1] 0.2173913
```

## PS2

Let's add in some possibilities. It looks like this is the best way to use gRain, but it's kind of confusing.

```
library(gRain)
```

```
## Loading required package: gRbase
```

```
diff <- cptable(~diff, values = c(.7,.3), levels = c("yes", "no"))
intell <- cptable(~intell, values = c(.2,.8), levels = c("high", "low"))
grade <- cptable(~grade|diff:intell, values = c(.6,.4,.8,.2,.01,.90,.01,.99), levels = c("low", "high"))
letter <- cptable(~letter|grade, values = c(.9,.1,.05,.95), levels = c("low", "high"))
sat <- cptable(~sat|intell, values = c(.9,.1,.2,.8), levels = c("low", "high"))

plist <- compileCPT(list(diff,intell,grade,letter,sat))
grain <- setEvidence(grain(plist), nodes = "letter", state = "high")
querygrain(grain, nodes = "diff", type = "marginal")
```

```
## $diff
## diff
##      yes      no
## 0.7084269 0.2915731
```