IS605 Computational Mathematics Assignment8

Prashant B. Bhuyan

March 25, 2015

Problem Set 1:

Your colleague either commutes by train or by the bus. 20 days of the month, she takes the train and the remaining 10 days she takes the bus. If she takes the train, she reaches work on time with a probability of 0.9. If she takes the bus, she frequently gets stuck in traffic and reaches work on time with a probability of 0.5. Given that she was on time today, what is the probability that she took the bus to work today?

Event A: Colleague Took Bus

Event B: Colleague is On Time

According to Bayes' Theorem:

P(A|B) = P(B|A) * P(A)/P(B)

We know that:

P(B|A) = 0.5

P(A) =

```
by_train_days <- 20
by_bus_days <- 10
p_a <- by_bus_days/(by_train_days+by_bus_days)

p_a
```

```
## [1] 0.3333
```

P(B) =

```
p_b <- (.9*20 + .5*10)/(by_train_days+by_bus_days)
p_b
```

```
## [1] 0.7667
```

So, by Bayes' Theorem we see there is a 21.73913% chance that our colleague took the bus to work today given that she was on time.

P(A|B) = P(B|A)*P(A)/P(B) =

```
p_ba <- .5

p_ab = (p_ba*p_a)/p_b

p_ab
```

```
## [1] 0.2174
```

Problem Set 2

*Ignored as per instructions.