Insurance

March 16, 2018

The cost of an insurance claim for a bodily injury due to a car accident follows a normal distribution with mu 15,000 and sigma of 5,000. The number of claims follows a poisson distribution with lambda 500 per month. Find the expected cost to the insurance company for each month in the next year.

In [2]:
```
months <- seq(1, 12)
average_claims_per_month <- 500
average_cost_per_claim <- 15000
standard_deviation_of_cost <- 2000
```

In [3]:
```
claims_per_month <- rpois(12, average_claims_per_month)
claims_per_month
```

1. 484 2. 540 3. 506 4. 490 5. 487 6. 496 7. 487 8. 505 9. 477 10. 449 11. 503 12. 483

In [4]:
```
cost_to_company <- rep(0, 12)
```

In [9]:
```
month_counter <- 1
for (claims in claims_per_month){
    for (claim in 1:claims){
        cost_of_claim <- rnorm(1, average_cost_per_claim, standard_deviation_of_cost)
        cost_to_company[month_counter] <- cost_to_company[month_counter] + cost_of_cla
    }
    month_counter <- month_counter + 1
}
```

In [25]:
```
for (month in 1:length(cost_to_company)){
     cat('Expected cost for month', month, 'is', cost_to_company[month], '\n')
 }
```

```
Expected cost for month 1 is 7451529
Expected cost for month 2 is 8421498
Expected cost for month 3 is 7943877
Expected cost for month 4 is 7511610
Expected cost for month 5 is 7614942
Expected cost for month 6 is 7717531
Expected cost for month 7 is 7553064
Expected cost for month 8 is 7771455
Expected cost for month 9 is 7357920
```

```
Expected cost for month 10 is 6964124
Expected cost for month 11 is 7828068
Expected cost for month 12 is 7476391
```

```
In [27]: annual_cost <- sum(cost_to_company)
         cat('Expected annual cost is', annual_cost)
```

```
Expected annual cost is 91612011
```

```
In [31]: cat('Simple expected annual cost', length(months)*average_claims_per_month*average_cos
```

```
Simple expected annual cost 9e+07
```