Week 6 Problem Set

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Problem Set 1

1 When you roll a fair die there are 6^3 which is 216 possible outcomes.

2 The probability of getting a sum total of 3 when you roll a die two times is first $(1, 2)$ then $(2, 1)$. So there are $2/36$ changes of getting it, which reduces to $1/18$.

3 If you are in a room of 25 people the probability that two of them have the same birthday is:

$$\frac{365!}{365^{25}(340)!}$$

This is based on the assumption that all birthdays are equally as likely and equal to $1/365$. If you add 25 people so that are 50 people in the room

$$\frac{365!}{365^{50}(315)!}$$

Results:

```
birthday <- function(n){
   return (1 - (prod(365:((365-n)+1))/(365^n)))
}

birthday(25)
```

```
## [1] 0.5687
```

```
birthday(50)
```

```
## [1] 0.9704
```