20121865_BinomialDistribution

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Setting my student ID as a seed for the pseudo random number generator:

```
set.seed(20121865)
```

Setting the size:

```
sample(20:30,1)
```

```
## [1] 29
```

The size for this distribution is 29

Setting the probability of success:

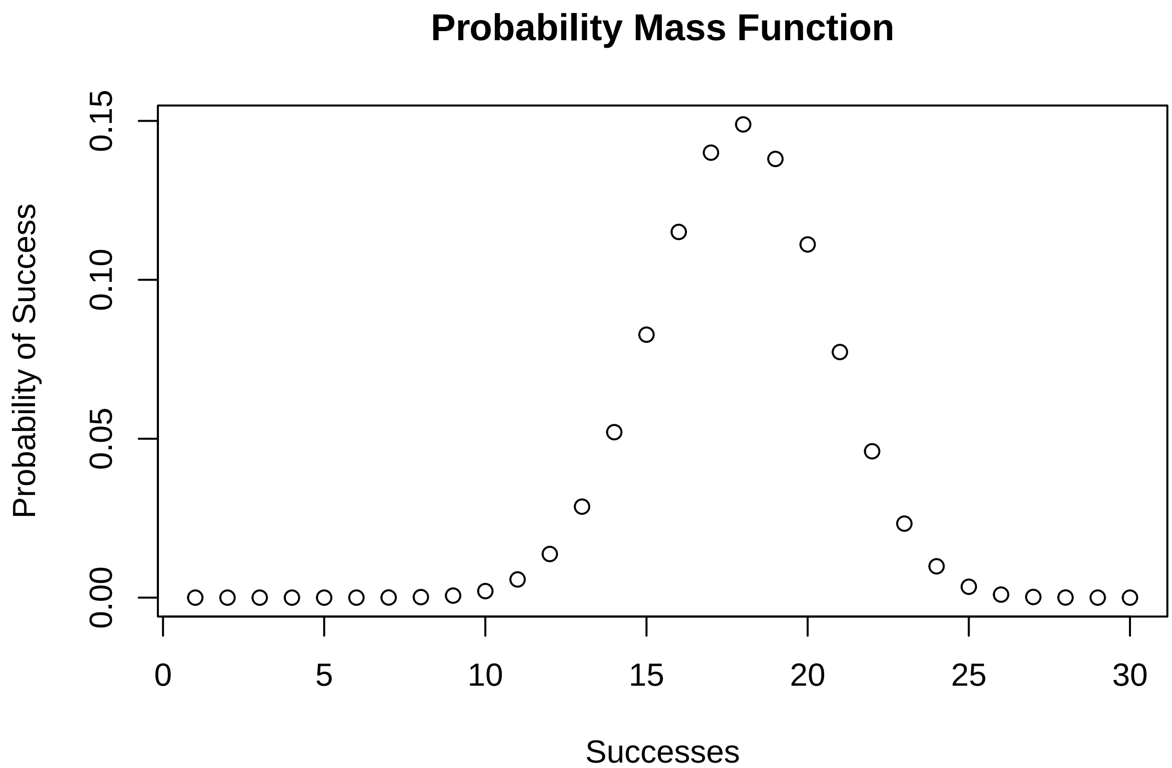
```
rbeta(1,2,2)
```

```
## [1] 0.5817177
```

The probability of success for this distribution is 0.5817 (4 d.p.)

Plotting the probability mass function for the distribution:

```
p = 0.5817
n = 29
plot(dbinom(0:29, n, p),
     ylab = "Probability of Success",
     xlab = "Successes",
     main = "Probability Mass Function")
```



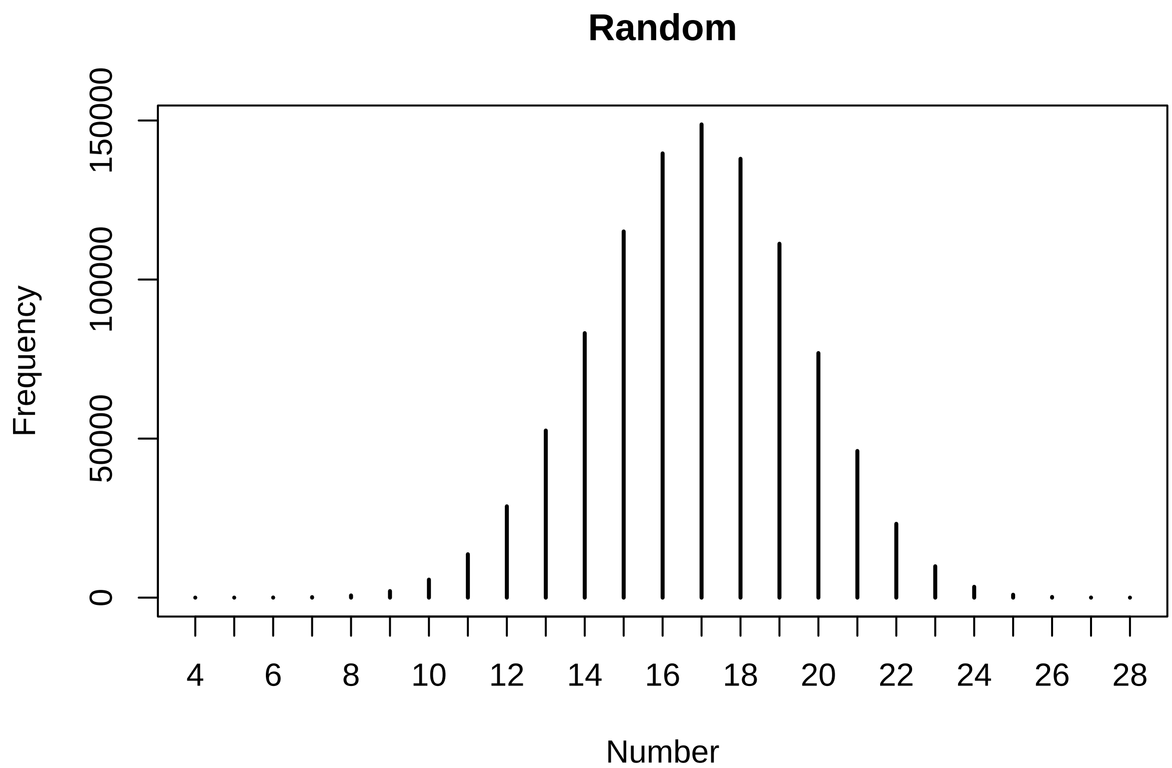
Checking if the probabilities add up to one:

```
sum(dbinom(0:29, n, p))
```

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

Using rbinom() to generate a random sample from the distribution and plotting the frequency:

```
r = rbinom(1e6, n, p)
plot(table(r),
     ylab = "Frequency",
     xlab = "Number",
     main = "Random")
```



Making my own dbinom() function and comparing it to R's dbinom() function:

```
mydbinom <- function(n,r,p) {
  return(factorial(r) / (factorial(n) * factorial(r - n))* p^n * (1 - p)^(r - n))
}
```

Testing the function to see if the probabilities add up to one

```
sum(mydbinom(0:29, n, p))
```

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

Comparing my function to R's dbinom()

```
sprintf("%.25f", dbinom(5, n, p))
```

```
## [1] "0.0000065141232736732726694"
```

```r
sprintf("%.25f", mydbinom(5, n, p))
```

```
## [1] "0.0000065141232736732548815"
```

From comparing both functions, I found that every number greater than 0 will result to both functions coming up with different probabilities in the decimals.