Experiment 1

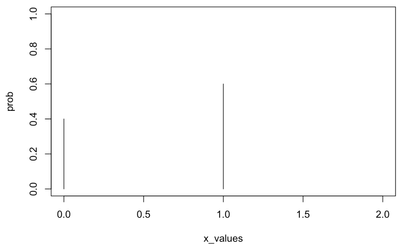
```
x=rbinom(1,1,0.6)
print(x)
```

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

```
y=dbinom(1,1,0.6)
print(y)
```

```
## [1] 0.6
```

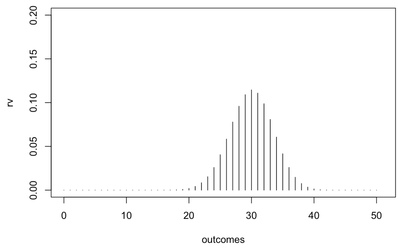
```
p=0.6
prob=c(1-p,p)
#print(s)
x_values=c(0,1)
plot(x_values,prob,type='h',xlim=c(0,2),ylim=c(0,1))
```




```
x=rbinom(1,50,0.6)
print(x)
```

```
## [1] 28
```

```
n=50
outcomes=0:n
rv=vector("numeric",length=51)
for(i in outcomes){
  rv[i+1]=dbinom(i,50,0.6)
}
plot(outcomes,rv,type='h',xlim=c(0,n+1),ylim=c(0,0.2))
```




```
moment_ans=function(q){
  s=0
  for(i in outcomes){
    s=s+(i^q)*rv[i+1]
  }
  return(s)
}
print(moment_ans(1))#Mean
```

```
## [1] 30
```

```
mvar=moment_ans(2)-((moment_ans(1))^2)
print(mvar)
```

```
## [1] 12
```

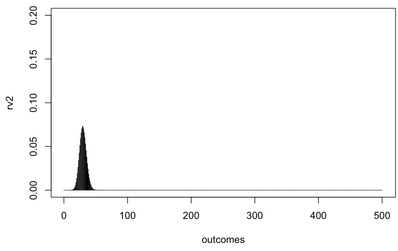
```
Ti=5
t=0.01
n=Ti/t
outcomes=0:n
rv=vector("numeric",length=n+1)
for(i in outcomes){
  rv[i+1]=dbinom(i,n,0.4)
}
moment_ans=function(q){
  s=0
  for(i in outcomes){
    s=s+(i^q)*rv[i+1]
  }
  return(s)
}
mmean=moment_ans(1)#Mean
mvar=moment_ans(2)-((moment_ans(1))^2)
print(mmean)
```

```
## [1] 200
```

```
print(mvar)
```

```
## [1] 120
```

```
lambda1=30
x=rpois(1,lambda1)
rv2=vector("numeric",length = n+1)
for(i in outcomes){
  rv2[i+1]=dpois(i,lambda = lambda1)
}
plot(outcomes,rv2,type='h',xlim=c(0,n+1),ylim=c(0,0.2))
```




```
e=vector("numeric",length=10000)
nc=10:10009
for(n in nc){
  outcomes=0:n
  rv=vector("numeric",length=n+1)
  for(i in outcomes){
    rv[i+1]=dbinom(i,n,0.6)
  }
  moment_ans=function(q){
    s=0
    for(i in outcomes){
      s=s+(i^q)*rv[i+1]
    }
    return(s)
  }
  mmean=moment_ans(1)#Mean
  lambda1=mmean
  x=rpois(1,lambda1)
  rv2=vector("numeric",length = n+1)
  for(i in outcomes){
    rv2[i+1]=dpois(i,lambda = lambda1)
  }
  e[n-9]=mean(abs(rv-rv2))
}
plot(nc,e,type='l')
```