# Assignment 4

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```r
###Question1
x<-c(0,1,2,3,4)
y<-c(0.41,0.37,0.16,0.05,0.01)
sum(x*y)
```

```
## [1] 0.88
```

```r
weighted.mean(x,y)
```

```
## [1] 0.88
```

```r
c(x%*%y)
```

```
## [1] 0.88
```

```r
###Question2
f<-function(t)
{
  t*0.1*exp(-0.1*t)
}
E<-integrate(f,0,Inf)
print(E)
```

```
## 10 with absolute error < 6.7e-05
```

```r
###Question3
#y=12x+(3-x)*2 -3*6 solving we get -10x-12
x<-c(0,1,2,3)
y<-10*x-12
p<-c(0.1,0.2,0.2,0.5)
z<-sum(y*p)
print(z)
```

```
## [1] 9
```

```r
###Question4
#first moment=expected mean
#second moment=E(X^2)
#variance=2nd momement-(firstmoment)^2
f1<-function(x)
```

```
{
  x*0.5*exp(-abs(x))
}
f2<-function(x)
{
  x*x*0.5*exp(-abs(x))
}
firstmoment<-integrate(f1,1,10)
secondmoment<-integrate(f2,1,10)
variance=secondmoment$value-(firstmoment$value*firstmoment$value)
sprintf('Mean is :')
```

```
## [1] "Mean is :"
```

```
print(firstmoment$value)
```

```
## [1] 0.3676297
```

```
sprintf('Variance is :')
```

```
## [1] "Variance is :"
```

```
print(variance)
```

```
## [1] 0.7817776
```

```
###Question5
f <- function(y){(3/4)*(1/4)^(sqrt(y)-1)}
x<-3
y = x^2
proby <- f(y)
print(proby)
```

```
## [1] 0.046875
```

```
x<- c(1,2,3,4,5)
y= x^2
proby <- f(y)
print(proby)
```

```
## [1] 0.750000000 0.187500000 0.046875000 0.011718750 0.002929688
```

```
#Expected value of y
Expval <- sum(y*proby)
print(Expval)
```

```
## [1] 2.182617
```