

NAME\_ ASHUTOSH ARDU  
REG NO\_ 20BRS1262  
DATE\_ 29-4-2021

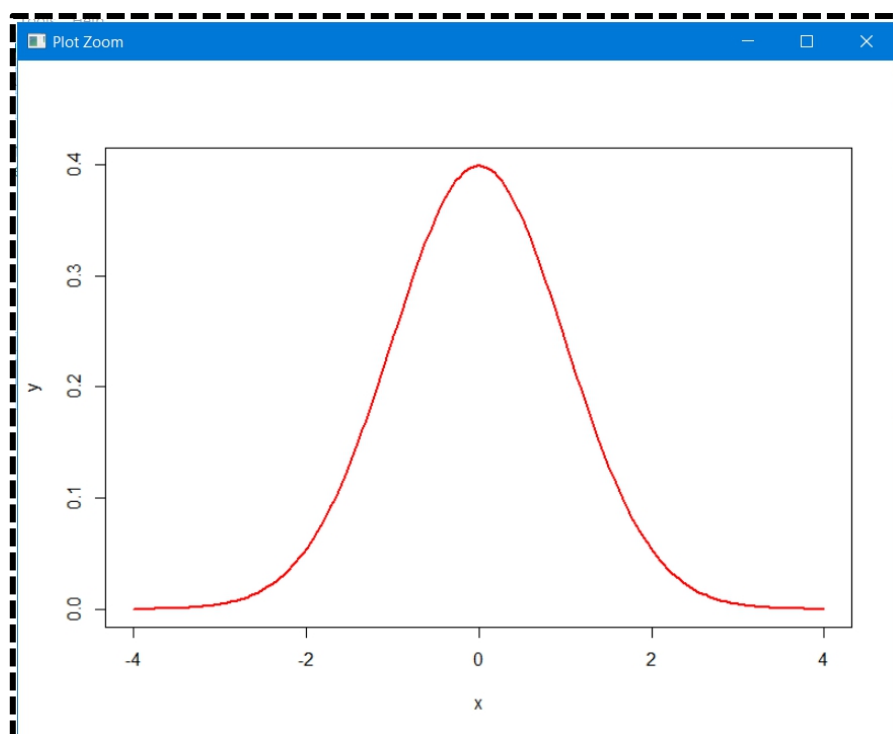
# MATHS STATS LAB-6

## OUTPUTS

FINDING THE NORMAL DISTRIBUTION USING FORMULA  
WITH MEAN=0 AND SD=1

```
Console Terminal x Jobs x
~/
> x=seq(-4,4,length=200)
> y=1/sqrt(2*pi)*exp(-x^2/2)
> plot(x,y,type="l",lwd=2,col="red")
> |
```

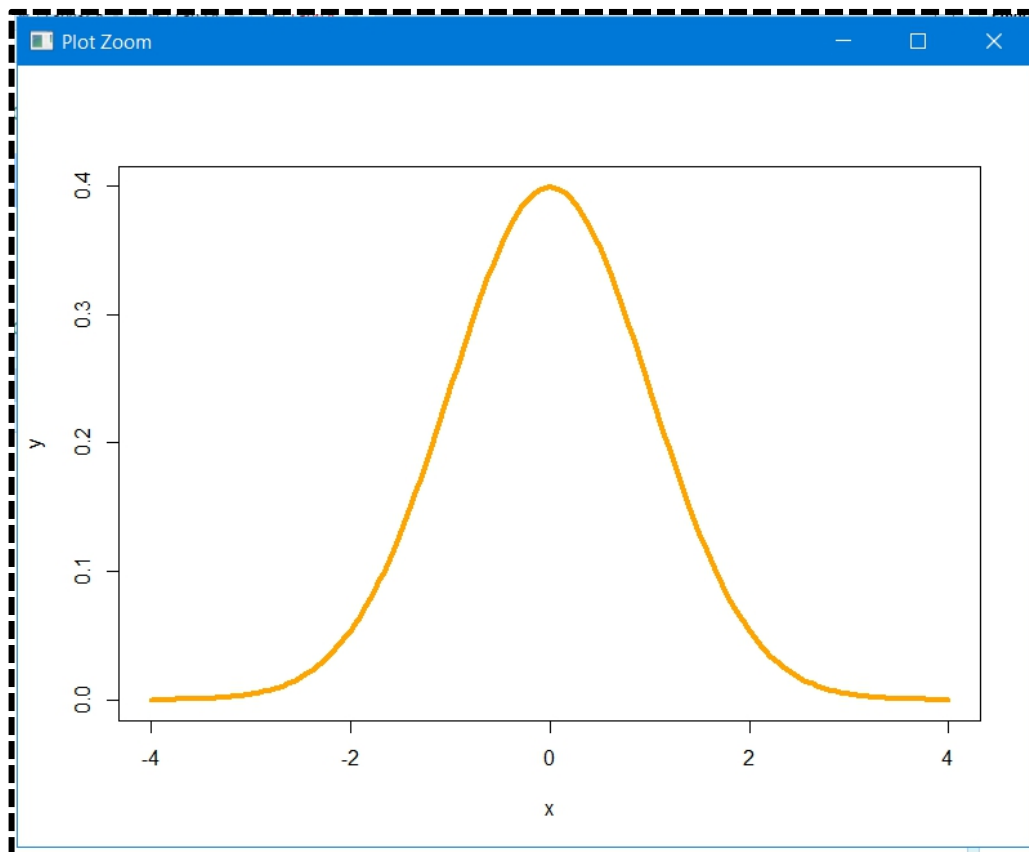
PLOTTING THE ABOVE X AND Y VALUES (NORMAL DISTRIBUTION CURVE)



## CREATING A SEQUENCE OF NUMBERS AND FINDING ITS NORMAL DISTRIBUTION USING DNORM FUNCTION

```
Console Terminal x Jobs x  
~/ ➔  
> x=seq(-4,4,length=200)  
> y=dnorm(x,mean=0,sd=1) # Alternative  
> plot(x,y,type="l",lwd=4,col="orange")  
>
```

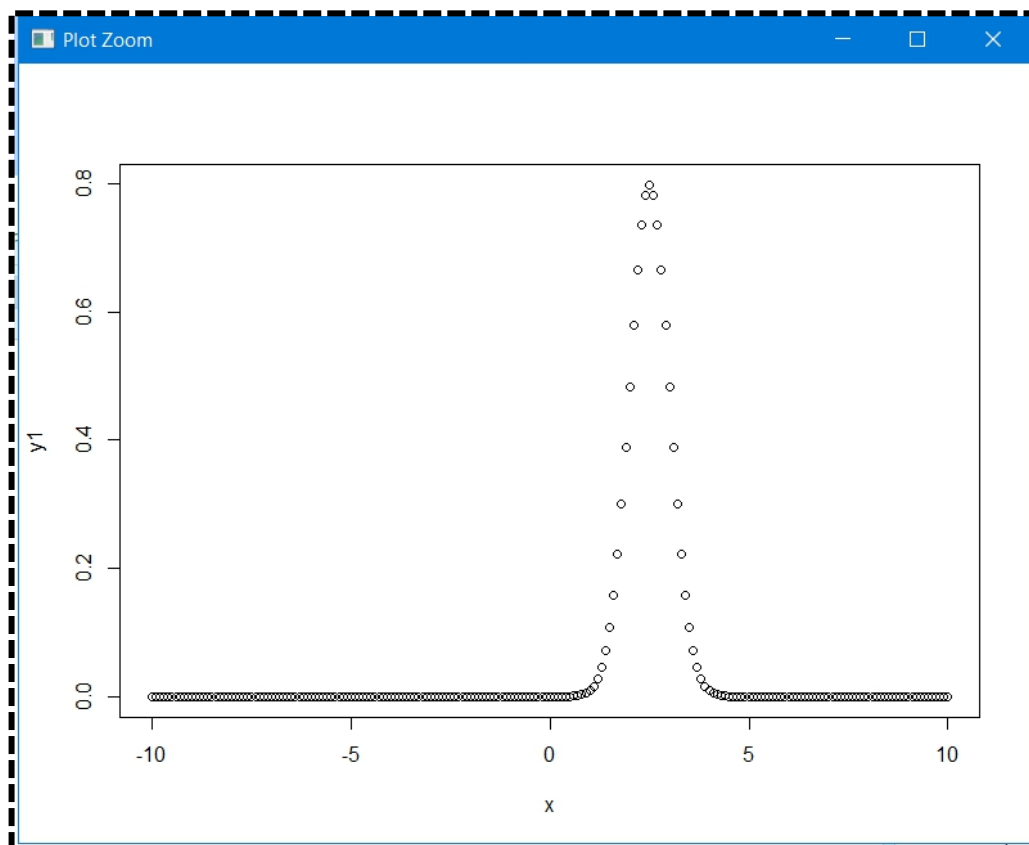
## PLOTTING THE ABOVE MENTION VALUES



## CREATING A SET OF VALUES FINDING ITS NORMAL DISTRIBUTION WITH MEAN=2.5 AND SD=0.5

```
Console Terminal x Jobs x  
~/  
> # -10 to 10 in 0.1 steps  
> # mean=2.5 sd=0.5  
> # visualize the normal distribution and cdf  
> x=seq(-10,10,by=0.1)  
> y1=dnorm(x,mean=2.5,sd=0.5)  
> plot(x,y1)  
> y2=pnorm(x,mean=2.5,sd=0.5)  
>
```

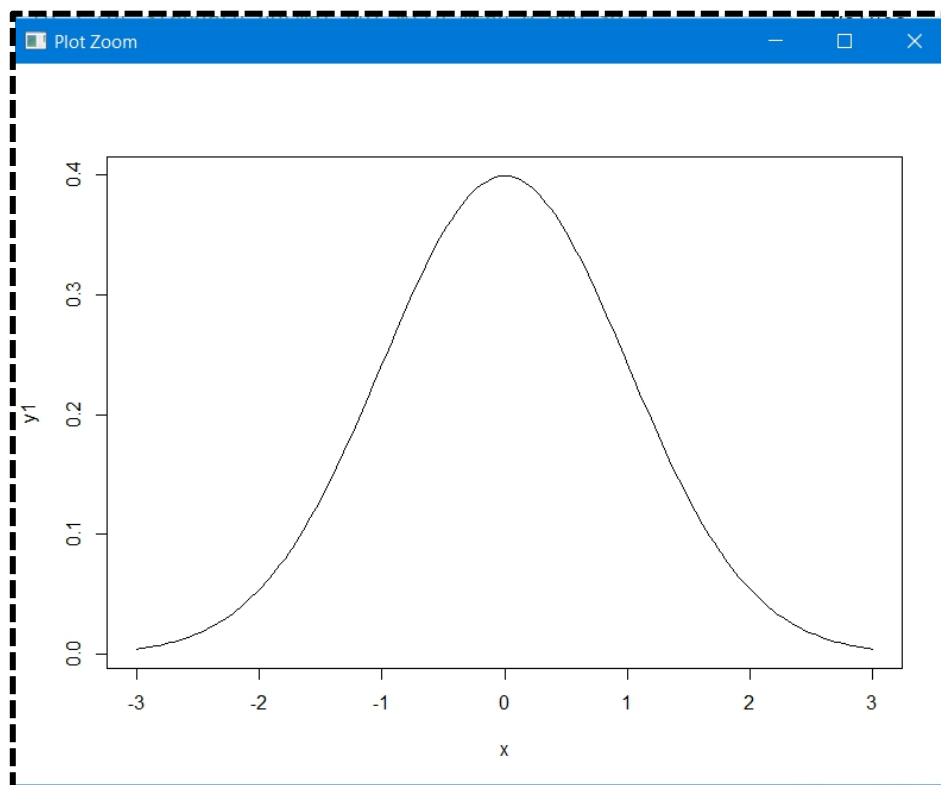
## PLOTTING THE ABOVE MENTION VALUES



## CREATING A SEQUENCE OF VALUES AND FINDING ITS NORMAL DISTRIBUTION USING DNORM FUNCTION

```
Console Terminal x Jobs x
~/
> # To create a sequence of 200 numbers with x=-3 to 3 for standard normal pdf with mean 0 and sd=1
> x=seq(-3,3,length=200)
> y1=dnorm(x)
> plot(x,y1,type='l')
>
```

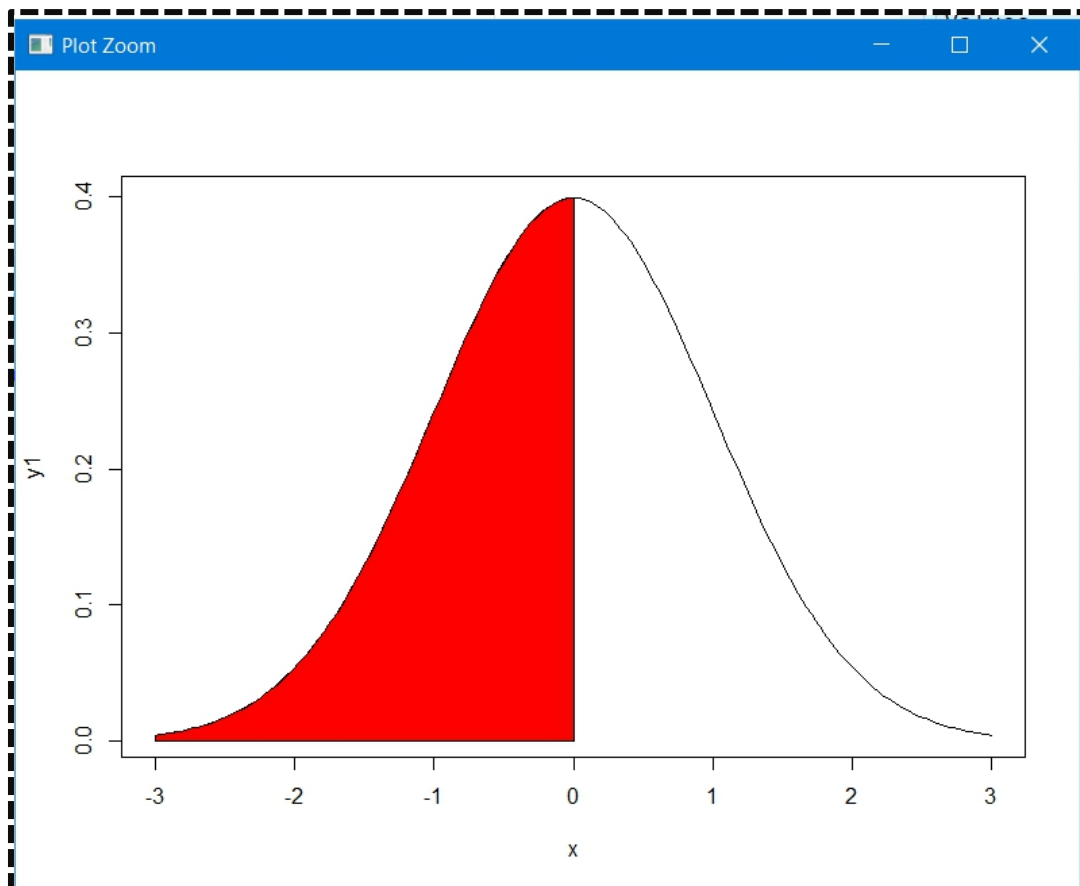
## PLOTTING THE ABOVE MENTIONED VALUES



## NOW SHADING THE AREA THE UNDER THE CURVE ( ALL THE VALUES TO THE LEFT OF 0 )

```
Console Terminal x Jobs x
~/
> # To create a sequence of 200 numbers with x=-3 to 3 for standard normal pdf with mean 0 and sd=1
> x=seq(-3,3,length=200)
> y1=dnorm(x)
> plot(x,y1,type='l')
> x=seq(-3,0,length=100)
> y=dnorm(x,mean=0,sd=1)
> polygon(c(-3,x,0),c(0,y,0),col="red")
> pnorm(0,mean= 0 ,sd=1)
[1] 0.5
>
```

## GRAPH FOR THE ABOVE MENTIONED DISTRIBUTION

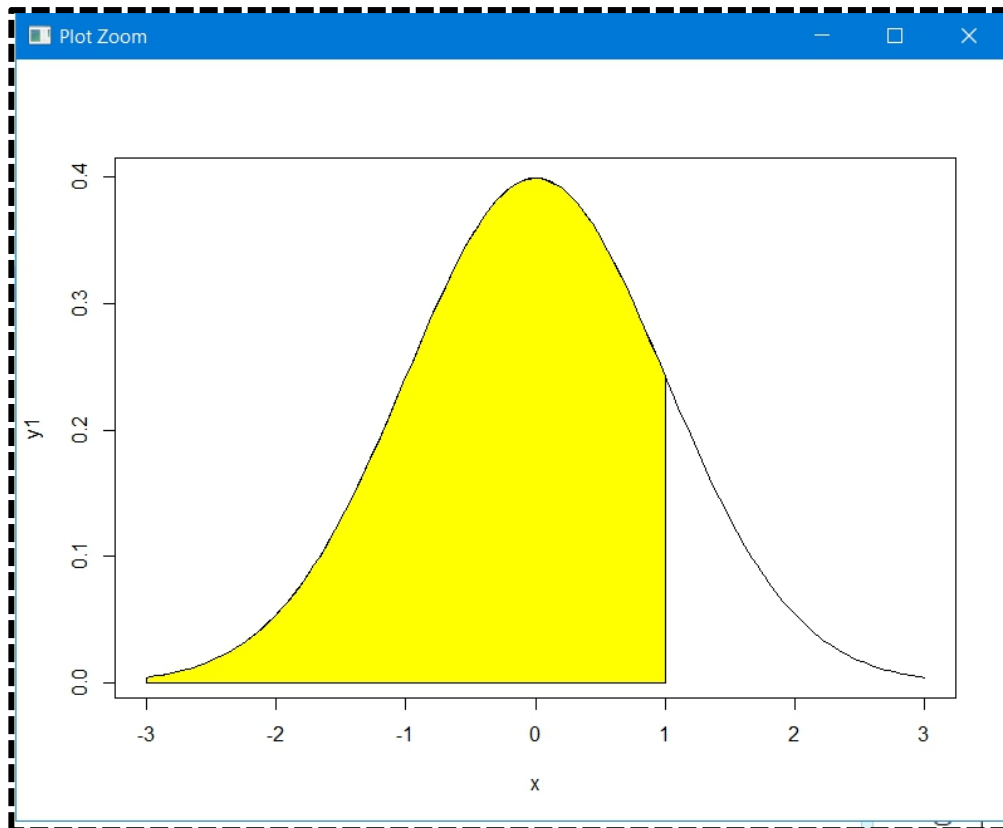


## SHADING THE AREA IN THE ABOVE MENTIONED GRAPH FOR VALUES TO THE LEFT OF 1

```
Console Terminal x Jobs x
~/
> # To find the area to the left of 1
> # Please note first graph and then comes the
> # area coloration
> x=seq(-3,1,length=100)
> y=dnorm(x,mean=0,sd=1)
> polygon(c(-3,x,1),c(0,y,0),col="yellow")
> pnorm(0,mean= 0 ,sd=1)
[1] 0.5
> |
```



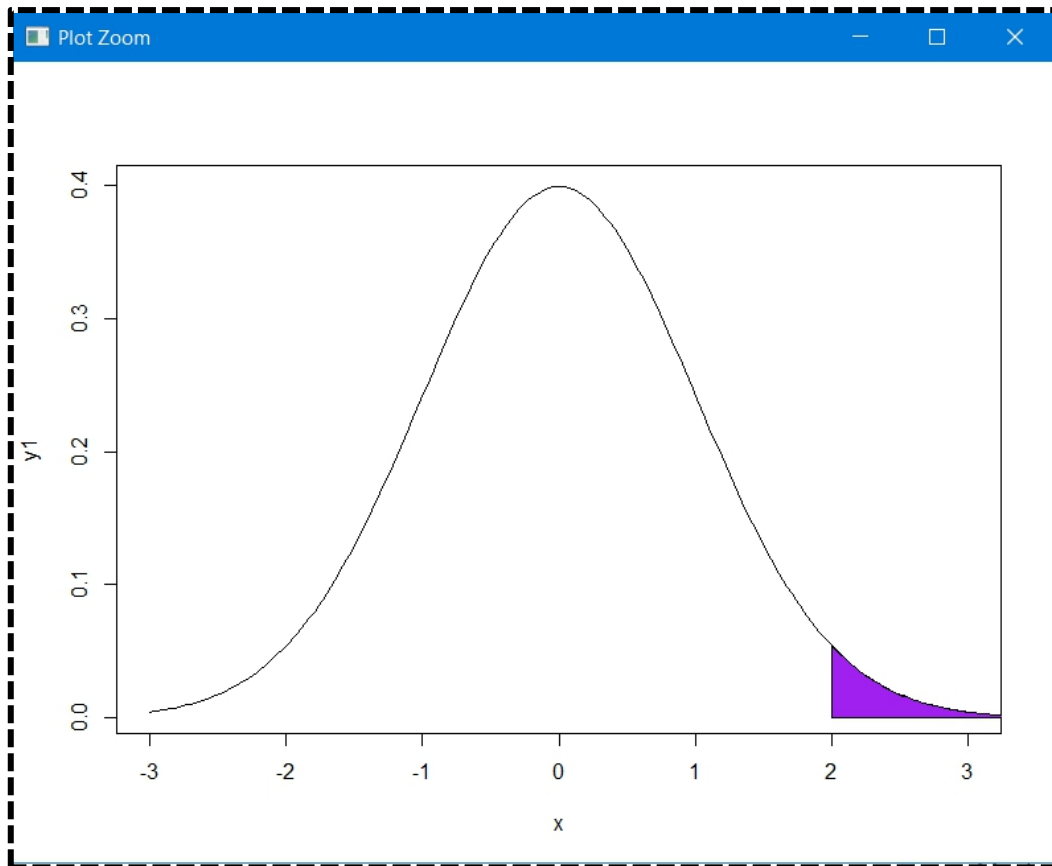
## GRAPH



SHADING THE AREA IN THE ABOVE PREVIOUSLY MENTIONED GRAPH  
FOR THE VALUES TO THE RIGHT OF 2

```
Console Terminal x Jobs x
~/
> x=seq(-3,3,length=200)
> y1=dnorm(x)
> plot(x,y1,type='l')
> # To find the area to the right of 2
> x=seq(2,4,length=100)
> y=dnorm(x)
> polygon(c(2,x,4),c(0,y,0),col="purple")
> pnorm(0)
[1] 0.5
> |
```

## GRAPH



SHADING THE 40% AREA OF THE GIVEN GRAPH  
FINDING THE VALUE OF X FROM THE GIVEN VALUE OF AREA  
USING QUANTILE FUNCTION

```
Console Terminal x Jobs x
~/
> x=seq(-3,3,length=200)
> y1=dnorm(x)
> plot(x,y1,type='l')
> # Finding the x value given the area (Quantile percentile)
> #text(-1,0.1,"0.40") # on x=-1 y=0.2 and 40%)
> qnorm(0.40)
[1] -0.2533471
> x=seq(-3,-0.2533,length=100)
> y=dnorm(x,mean=0,sd=1)
> polygon(c(-3,x,-0.2533),c(0,y,0),col="blue")
>
```



# GRAPH

