**Probability Distribution:**

**Binomial Distribution:**

A1)

N=4, θ=1/2, x=2

f(2)

A2)

N=5, θ=1/2

1. 1-f(0)
2. 1-[f(0)+f(1)]

A3)

N=5, θ=1/6

a)f(2)

b)f(0)+f(1)

c)1 – [(f(0)+f(1)]

A4)

N=6, θ=2/5

f(4)+f(5)+f(6)

A5)

N=5, θ=.10

f(0)+f(1)

A6)

N=10, θ=6/10, 80% of 10 = 8

f(8) + f(9) + f(10)

**Normal Distribution:**

A1)

1. When x = 60.8, Z = 60.8 – 65 / 2.1 = -2

When x= 67.1, Z = 67.1 – 65 / 2.1 = 1

So probability between -2 and 1 is 89%

1. Is more than 67.1 (i.e. more than Z>1) is 16%

A2)

When x= 72, Z = 72 – 68.22 / Root 10.8 = 1.15

From Z table, when Z = 1.15, prob is .3749

So more than 1.15 = (.5 - .3749)

A3)

When x = 100, Z = 100-90 / 20 = .5

Probability when Z = .5 is .1915

More than .5 is (.5 - .1915)

A4)

a)When x = 15, Z = 15-12/3 = 1

Prob when Z = 1 is .3413

So more than that is (.5 - .3413)

b)When x = 6, Z = 6-12/3 = -2

Probability when Z = -2 is .4772

Less than -2 is (.5 - .4772)

c)When x = 10, Z = 10 – 12/3 = -.66

When x = 14, Z = 14 – 12/3 = +.66

So between -.66 and .66 is (.2454\*2)

A5)

For x = 90, Z = 90-80/2 = 2

Percentile mean <2 here, so (.4772+.5) = .98

So. His percentile is 98, i.e. 98% has scored below 90

A6)

For x = 60, the area greater to it is 5%

So, the area lesser to it till zero is 45%

When probability is 45%, the corresponding Z value is 1.64

Hence, σ = (60 – 50) / 1.64

**Business questions\_bank: (Probability Distribution)**

A1)

>gb1<-subset(r, GoodBad = = “1”)

>table(gb1 $ Check.Account.Status) #which shows count of A13 is 49 #

So 75% of Good customers = .75\*700 = 525

So, at least 75% of Good means, f(x) values 525 to 700

θ= 49/700= .07

>(dbinom(525:700, size = 700, prob = .07)

>sum(dbinom(525:700, size = 700, prob = .07)

A2)

>gb2<-subset(r, GoodBad = = “0”)

>table(gb2 $ Credit.History) # which shows count of A33 is 28 #

So, 10% of Bad customers = (.10\*300) = 30

So, at most 10/5 of Bad means, f(x) values 0 to 30

θ=28/300 = .093

>(dbinom(0:30, size = 300, prob = .093)

>sum(dbinom(0:30, size = 300, prob = .093)

A5)

>mean(gb $ Duration)

>sd(gb $ Duration)

>pnorm(50, mean = , sd = , lower.tail = False)

A6)

>mean (gb $ Amount)

>sd (gb $ Amount)

>pnorm(5000, mean = , sd = ) # say value is X #

>pnorm(10000, mean = , sd = ) # say value is Y #

(X-Y) gives the probability within 5000 - 10000