****

**Get the CDF of f(x)**

**Then the inverse function is let u~U[0,1]**

**Return on Investment by the end of the year:**

**Let B is the starting budget**

**New budget B(i) = B(i-1)(1+X/100)**

**Application #2**

**Process #1: Point of accidents on the Highway**

**Let X(i) the distance between accident #(i) and accident #(i-1)**

**X(i)~ Exponential Dist. With E[X] = 10 Km**

**then λ = 1/E[X] = 1/10 accident/kl**

**Then the inverse:**

****

**X = -10 ln(1-u)**

**Process #2 : clearing the highway**

**Let Y(i) the time needed to clear the highway**

**Y(i) ~ Uniform [ 10 to 15] minutes**

**Inverse transform Y(i) = a+ (b-a) \*u**

**Process #3: Officer Time**

**OT(i) ~ (Erlnag (α=3,λ=5)) minutes**

**We use convolution method**

**OT(i) = T1 + T2 + T3**

**T1, T2, T3 ~ IID Exponential λ = 5**

**T1 = (-1/5)ln(1-u1) , T2 = (-1/5)ln(1-u2) , T3 = (-1/5)ln(1-u3)**

**Logic:**

**AT(i) : the location of (i) accident**

**AT(i) = AT(i-1) + X(i)**

**Total clearing time :**

**TCT(i) : total time until the accident is totally cleared from the highway**

**TCT(i) = Y(i) + OT(i)**