1.

(a)

T = 60 mins = 3600 s

C = 1267

X = C / T = 1267 / 3600 for the system

CPU:

U(CPU) = B(CPU) / T = 2929 seconds / 3600 s

So:

D(CPU) = U(CPU) / X(system) = B(CPU) / C = 2929 / 1267 = 2.312

Disk:

U(Disk) = B(Disk) / T

D(Disk = U(Disk) / X(system) = B(Disk) / C = 2765 / 1267 = 2.182

(b)

According to X(0) = U(j) / D(j) and U(j) <= 1, we can get

X(0) <= 1 / D(j), should hold for all devices in the system.

So X(0) <= 1 / max(D(j))

Here max(D(j)) = D(CPU)

So X(0) <= 1 / D(CPU) = 1 / 2.312 = 0.432

There is another bound for X(0), as described in slide, we get this bound from Little’s Law,

X(0) <= N / (think time + D(CPU) + D(Disk))

Set slop = think time + D(CPU) + D(Disk) = 14 + 2.312 + 2.182 = 18.494

Therefore when X(0) == 1 / D(CPU), N = slop \* 1 / D(CPU) = 7.999 = 8

So we can get the plot:

