Exercise 1 *1) Population: the 200 days (0.5 pt), variable X:number of rooms occupied each day (0.5 pt), sample size=200(0.5 pt), range =120-0=120 (0.5 pt).*

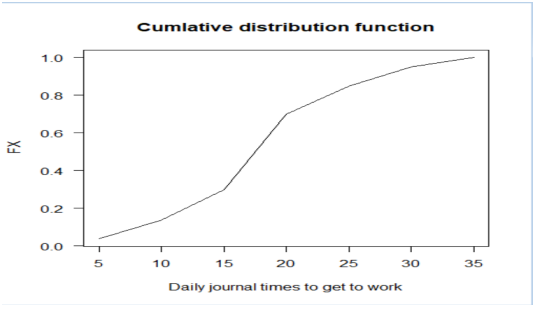
2)

class	c_i	n_i	f_i	f_i^{cum}	$n_i * c_i$	$n_i * c_i^2$
$[0, 20[$	*10*	*10*	*10/200*	*10/200*	*100*	*1000*
$[20, 40[$	*30*	*32*	*32/200*	*42/200*	*960*	*28800*
$[40, 60[$	*50*	*62*	*62/200*	*104/200*	*3100*	*155000*
$[60, 80[$	*70*	*50*	*50/200*	*154/200*	*3500*	*245000*
$[80, 100[$	*90*	*28*	*28/200*	*182/200*	*2520*	*226800*
$[100, 120[$	*110*	*18*	*18/200*	*200/200*	*1980*	*217800*

(3 pt)

3) $\bar{x} = 12160/200 = 60.8$ *; the average of occupied rooms is 61; (1 pt)*
$Var(X) = 874400/200 - 60.8^2 = 675.36$.*(1 pt)*
$\sigma = 675.36^{0.5} = 25.99$. *(1 pt)*
4) The highest number of rooms occupied is Mo;
$Mo \in [40, 60[\,,\ Mo = 40 + 20 * \frac{(62-32)}{(62-32)+(62-50)} = 54.28$.*(2 pt)*
5) $F_X(x) = \frac{10}{200} + \frac{32}{200}(\frac{x-20}{20})$ *(1 pt)*
Let N be the number of days when more than 30 rooms were occupied;
$N = 200 * (1 - F_X(30)) = 174$ *(1 pt)*

Exercise 2 *1)*



(1 pt)

2)Let N be the number of staff taking between 10 and 30 minutes to get to work,
$N = 80 * (F_X(30) - F_X(100)) = 76 - 11 = 65$.*(2 pt)*
3)

class	c_i	n_i	f_i	$n_i * c_i$
$[0, 5[$	*2.5*	*3*	*3/80*	*7.5*
$[5, 10[$	*7.5*	*11-3=8*	*8/80*	*60.0*
$[10, 15[$	*12.5*	*24-11=13*	*13/80*	*162.5*
$[15, 20[$	*17.5*	*56-24=32*	*32/80*	*560.0*
$[20, 25[$	*22.5*	*68-56=12*	*12/80*	*270.0*
$[25, 30[$	*27.5*	*76-68=8*	*8/80*	*220.0*
$[30, 35]$	*32.5*	*80-76=4*	*4/80*	*130.0*

(2 pt)

4) $\bar{x} = 1410/80 = 17.625$. *(1 pt)*
$Mo \in [15, 20[\,,\ Mo = 15 + 5 * \frac{(32-13)}{(32-13)+(32-12)} = 17.44$. *(1 pt)*
$Me \in [15, 20[\,,\ Me = 15 + 5 * \frac{40-24}{56-24} = 17.5$ *(1 pt)*