First HW for 3770

1.2 n 19

a) All but 1 so the proportion is $99/100 = 0.99$ for 1 particle

With less than 5 we have $1+2+3+2+11 = 29$. So the proportion is

$$(100-29)/100 = 0.71$$

b) between 5 and 10 inclusive

$$(15+18+10+12+4+5)/100 =$$

strictly

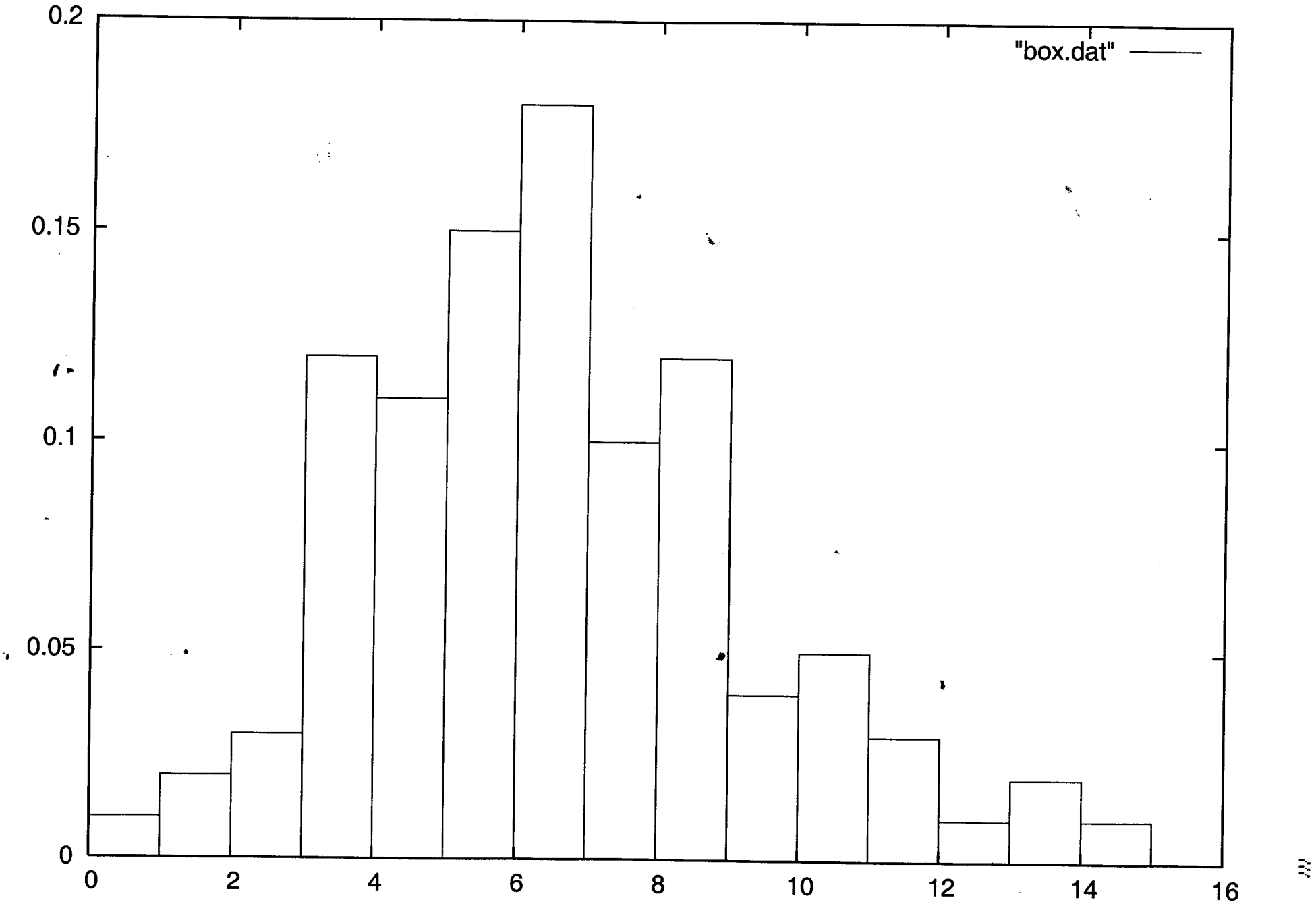
$$(18+10+12+4)/100$$

c) Frequencies

| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.01 | 0.02 | 0.03 | 0.02 | 0.12 | 0.15 | 0.18 | 0.1 | 0.12 | 0.04 | 0.05 | 0.03 | 0.01 | 0.02 | 0.01 |

See included graph.

The histogram is probably unimodal (the mode is 8) and the maxima at 3 and 8 are fluctuations.
It is also almost symmetric


"box.dat"
0.2
0.15
0.1
0.05
0
0
2
4
6
8
10
12
14
16

1.4 number 49 and 53

49

a) $\sum_i x_i = 56.80$

$\sum_i x_i^2 = 197.8040$

b) $s^2 = \frac{1}{n-1}\left(\sum_i x_i^2 + \frac{\left(\sum_i x_i\right)^2}{n}\right) =$

$= \frac{1}{16}\left(197.8040 + \frac{(56.80)^2}{17}\right) = 0.5016$

$s = \sqrt{s^2} = 0.708$

53

~~median $\tilde{x}$: 3.88~~

~~lower fourth = 2.34~~

~~upper fourth = 2.43~~

~~$f_s$:~~

1st: order results

2.34 2.43 2.62 2.74 2.74 2.75 2.78 3.01
3.46 3.56 3.65 3.85 3.88 3.93 4.21 4.33
4.52 (4.60 see point a)

median $\tilde{x} = 3.46$

a) upper fourth = 3.88 lower fourth = 2.74

b) $f_s = 3.88 - 2.74 = 1.14$

c) Nothing change: median, upper fourth and lower fourth are unchanged.

d) Till it become greater than the ~~upper~~ lower fourth 2.74 i.e. 0.40

e) Lower fourth remain unchanged
Upper fourth = 3.93
$f_s = 3.93 - 2.74 = 1.19$

2.1 number 5

a) {(1,1,1) (1,1,2) (1,1 3) (1,2,1) (1,2,2) (1,2,3)
(1,3,1) (1,3,2) (1,3,3) (2,1,1) (2,1,2) (2,1,3)
(2,2,1) (2,2,2) (2,2,3) (2,3,1) (2,3,2) (2,3 3)
(3,1,1) (3,1,2) (3,1,3) (3,2,1) (3,2,2) (3,2,3)
(3,3,1) (3,3,2) (3,3,3)} = S

b) (1,1,1) (2,2,2) (3,3,3)

c) (1,2,3) (1,3,2) (2,3,1) (2,1,3)
(3,1,2) (3,2,1)

d) (1,1,1) (1,1,3) (1,3,1) (1,3,3)
(3,1,1) (3,1,3) (3,3,1) (3,3,3)

Ex 1.2 n 19 3 pts: 1 for each letter

Ex 1.4 n 49 2 pts: " "
Ex 1.4 n 53 5 pts: " "
Ex 2.1 n 5 4 pts: " "

Total: 14 pts