

Semester 1	Solution to Problem Set 1	2013
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1. The frequency table:

x	0	1	2	3	4	5	6	7	8	Total
freq	9	8	4	4	2	1	1	1	1	31

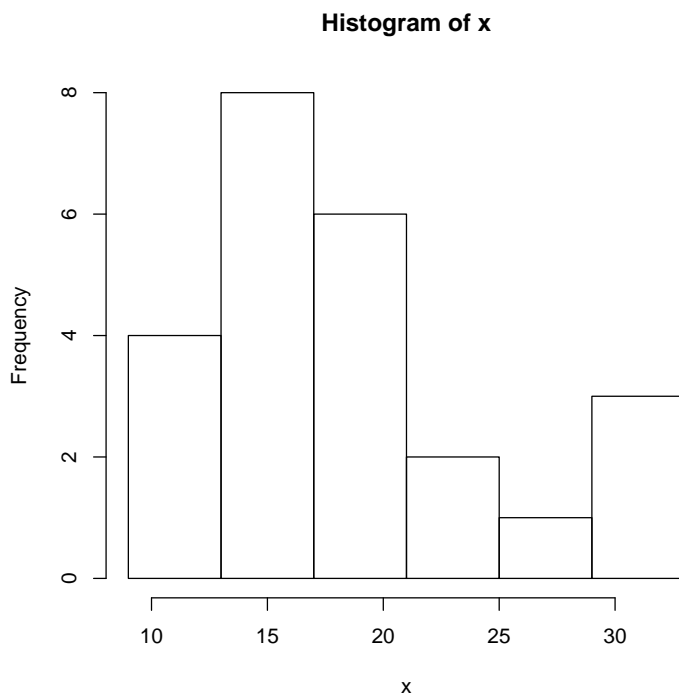
2. B Node is the observation with highest frequency. From the frequency table above, “0” has the highest frequency of “9” and hence is the node of the data.
3. B Since there are $n = 31$ observations, the median is located at the $\frac{31+1}{2} = 16$ -th observation in ascending order. The cumulated frequencies of the table in Q1 are 9,17,21,25,27,28,29,30,31. Hence the median lies in the 2nd class ($16 < 17$) and so takes the value of 1.
4. D The mean is $\frac{1}{31} \sum_{i=1}^{31} x_i = \frac{1(8)+2(4)+3(4)+4(2)+5+6+7+8}{31} = 2$.

In R

```
> x=c(2,0,0,1,1,0,2,1,3,3,6,7,0,4,1,0,1,1,3,2,1,0,8,0,0,4,5,1,0,2,3)
> table(x)
x
0 1 2 3 4 5 6 7 8
9 8 4 4 2 1 1 1 1
> median(x)
[1] 1
> mean(x)
[1] 2
```

5. Mean=18.79167. $n = 24$.
 The no. of class = $k = 1 + 3.322 \times \log(24)/\log(10) = 5.59$. Take $k = 6$
 The class width = $w = (31 - 10)/6 = 3.5$. Take $w = 4$.
 Hence the class intervals are (9,13],(13,17],(17,21],(21,25],(25,29],(29,33].
 The frequency table is

CLASS INTERVAL	CLASS CENTER	FREQUENCY
9-13	11	4
13-17	15	8
17-21	19	6
21-25	23	2
25-29	27	1
29-33	31	3
TOTAL		24



6. 0.1, 0.2, 0.7, 0.7, 0.9, 1.1, 1.6, 4.0, 6.5, 9.2, 11.9, 29.1.
The stem-and-leaf plot for the data is

The decimal point is 1 digit(s) to the right of the |

```
0 | 00111112479
1 | 2
2 | 9
```

7. R exercise:

```
> x=c(0.7,1.1,0.7,0.9,6.5,1.6,4.0,29.1,0.2,0.1,9.2,11.9)
> mean(x)
[1] 5.5
> sort(x)
[1] 0.1 0.2 0.7 0.7 0.9 1.1 1.6 4.0 6.5 9.2 11.9 29.1
> length(x)
[1] 12
> median(x)
[1] 1.35
> summary(x)
   Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
 0.100  0.700   1.350   5.500   7.175  29.100
> y=1:12
> plot(x,y)
> plot(y,x)
```

