Final answers should have accuracy to 6 decimal places. Show some work how medians and means are computed. *Giving only the answer will bring you few points.*

1. (8pts) A new sports stadium is proposed for a city. To gauge support for the idea, city officials decide to do a survey of the city's population. Comment on whether each of the following methods will produce a good random sample of the city's population:

    a Surveying the patrons at a local sports bar.
    b Picking random names from the phone book, and surveying those people by phone.
    c Surveying the patrons of the city's art museum.
    d Surveying patrons of one McDonald's.

a) Not a representative sample - people at a sports bar like sports

b) Pretty good representative sample, since most people have a landline

c) Not a representative sample - people at an art museum probably don't care much for sports

d) Since McD's caters to nearly everyone, this will be a pretty good sample. The drawback is that people at one McD's might only come from one neighborhood of a city.

2. (22pts) A shoe store would like to see how well their sales promotion is working. The employees record how many pairs of shoes are sold over 30 days, with results below. Do the following:
a) Construct a frequency distribution with first class 10–14.
b) Draw a histogram for the data
c) Enter a representative value for each interval.
d) Estimate the mean of the data based on the frequency distribution.
e) Find the actual mean and compare your answer to e).

b)
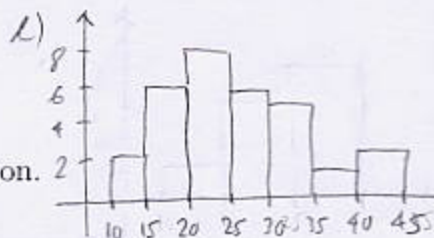
11, 15, ⟨33⟩, 44, 17, ⟨27⟩, ⟨21⟩, 19, ⟨20⟩, ⟨20⟩, 13, 15, ⟨22⟩, ⟨23⟩, 29, 41, 19, 28, ⟨32⟩, ⟨34⟩ 25, ⟨31⟩, 37, ⟨26⟩, ⟨24⟩, 25, 18, ⟨22⟩, ⟨24⟩ ⟨33⟩

a)

Class	Frequency	Rep. value
10-14	2	$12 = \frac{10+14}{2}$
15-19	6	17
20-24	8	22
25-29	6	27
30-34	5	32
35-39	1	37
40-44	2	42
	30	

d) $\bar{x} \approx \dfrac{2\cdot12 + 6\cdot17 + 8\cdot22 + 6\cdot27 + 5\cdot32 + 1\cdot37 + 2\cdot42}{30}$

$= \dfrac{745}{30} = 24.833333$

e) $\bar{x} = \dfrac{11+15+33+44+\cdots+24+33}{30}$

$= \dfrac{748}{30} = 24.933333$

3. (10pts) Student Steve examines the number of assignments due he has every week of a 15-week semester. They are listed below.

a) Find the midrange of the data. $0, 2, 3, 5, 3, 4, 3, 5, 4, 2, 4, 3, 2, 4, 2$

b) Find the median of the data.

c) Find the mean of the data.

a) midrange $= \dfrac{0+5}{2} = 2.5$

b) $0, 2, 2, 2, 2, 3, 3, \boxed{3}, 3, 4, 4, 4, 4, 5, 5$

middle number is $\dfrac{15}{2} = 7.5 = 8\text{th}$

median $= 3$

c) $\bar{x} = \dfrac{0 + 4 \cdot 2 + 4 \cdot 3 + 4 \cdot 4 + 2 \cdot 5}{15} = \dfrac{46}{15} = 3.066667$

4. (20pts) Jane counts how many pieces of mail she gets daily over a course of 26 days on which mail is delivered. Do the following:

a) Draw a histogram for the data.

b) Find the midrange of the data.

c) Find the median of the data.

d) Find the mean of the data.

Pieces of mail	Frequency (days)
0	4
1	3
2	7
3	6
4	2
5	3
6	1
	26

a)
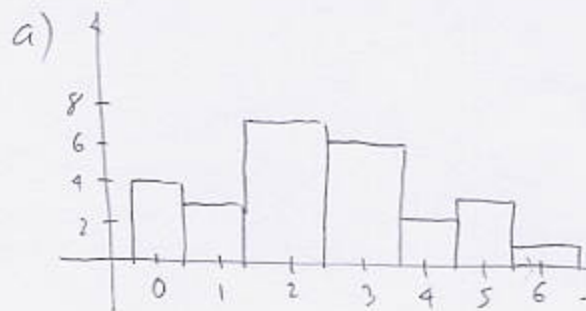
b) midrange $= \dfrac{0+6}{2} = 3$

c) $0, 0, 1, 1, 2, 2, 3, 3, 4, 4, 5, 5, 6$

4th, 7th, 14th

$\dfrac{26}{2} = 13$ Need 13th, 14th numbers, both 2: $\dfrac{2+2}{2} = 2$

median $= 2$

d) $\bar{x} = \dfrac{0 \cdot 4 + 1 \cdot 3 + 2 \cdot 7 + 3 \cdot 6 + 4 \cdot 2 + 5 \cdot 3 + 6 \cdot 1}{26}$

$= \dfrac{64}{26} = 2.461538$

Bonus. (2pts) Use the grade computer on the website to determine your grade in the course so far. Assume you are getting 3 points for participation, and no bonus for attendance. Write down your course average so far, and what you would need on the next exam to increase it by a letter grade.

(Answers will vary)