

HAIGAZIAN UNIVERSITY
FACULTY OF BUSINESS ADMINISTRATION AND ECONOMICS
ECO 231 – ECONOMIC STATISTICS I
QUIZ 1 – SPRING 2009-2010

NAME:**ID:****INSTRUCTOR:** ☐ Ms. Joumana Tannous**TIME:** 1 HOURS 15 MINS

INSTRUCTIONS: PLEASE WRITE YOUR NAME AND ID NUMBER AND TICK THE SECTION TO WHICH YOU BELONG.

ANYONE CAUGHT CHEATING WILL AUTOMATICALLY GET HIS COPY REMOVED AND WILL GET **ZERO**.

This exam consists of 8 pages, including 2 parts: 4 problems and 5 multiple choice questions. Check that none are missing. Answer the questions in the space provided for each problem; if more space is needed, you may use the back pages. Rough work can be done on the back pages. To receive full credits, you have to justify your answers.

GOOD LUCK!

QUESTION		GRADE
PART I: 1.	10 %	
2.	4 %	
3.	51 %	
4.	20 %	
PART II: MCQ: 1. – 5.	15%	
TOTAL	100%	

PART I: Solve the following 4 problems in the space provided for each

1. State for each of the following 10 variables what is its type and its level of measurement.

Variables	Type	Level of measurement
Students IQ rate.		interval ✓
Distance students travel to class.		ratio ✓
The jersey number of a sorority soccer team.		nominal ✓
A classification of the student by state of birth.		nominal ✓
A ranking of students as freshman, sophomore...		ordinal ✓
Number of hour's students study per week.		ratio ✓
The departments, such as editorial, advertising, sports.		nominal ✓
The classification of six colours of M&M's.		nominal ✓
Rating of a professor, superior, good, average, poor, inferior.		ordinal ✓
Dress size.		interval ✓

-5

2. The return on investment earned by Atkins Construction Company for four successive years was 30%, 20%, -40% and 200%.

What is the geometric mean rate of return on the investment?

$$ROI = \sqrt[4]{0.3 \times 0.2 \times 0.4 \times 2} = 0.4680$$

\uparrow
 - ?
 6

-9.5

3. Six students in Haigazian, were asked to study the average number of money students carried on them per day in Lebanese pounds. They randomly selected a sample of 40 students and collected the following data:

0	45,000	83,000	38,000	45,000
50,000	50,000	60,000	65,000	70,000
125,000	130,000	140,000	145,000	160,000
75,000	80,000	30,000	90,000	90,000
160,000	160,000	165,000	210,000	215,000
93,000	101,000	102,000	103,000	110,000
115,000	122,000	125,000	125,000	125,000
222,000	250,000	261,000	270,000	371,000

A. The first decided to study the data grouped. (Parts a. to c. are related to the group the data only)

a. Constructed the following Frequency Distribution

# of money	# of students	C.F.	M.P.	R.F.
[0; 62000[	8	8	31000	20%
[62000; 124000[	14	22	93000	35%
[124000; 186000[	11	33	155000	27.5%
[186000; 248000[	3	36	217000	7.5%
[248000; 310000[	3	39	279000	7.5%
[310000; 372000[	1	40	341000	2.5%
	40			

$$\begin{aligned}
 k: 2^k > n \\
 \Rightarrow 2^5 > 40 \\
 k = 5 \\
 i = \frac{371000 - 0}{6}
 \end{aligned}$$

~~i = 61834~~

$$i = 62000$$

b. Find the following:

Mean

$$\bar{X} = \frac{\sum f \cdot m}{n} = 127100 \text{ units}$$

The average number of money students are carrying are 127,100 units

Standard deviation

$$s = \sqrt{\frac{\sum f \cdot (m - \bar{x})^2}{n - 1}} = 78,109.65 \text{ units}$$

The deviation away from the average (mean) is 78,109.65 units.

Median location = $\frac{n}{2} = \frac{40}{2} = 20 \Rightarrow$ belongs to the interval: $[62000, 124000[$

$$\text{median} = 62000 + \left(\frac{20 - 8}{14} \right) \times 62000$$

$$= 115,142.8$$

Sentence - 1

The 3rd decile location = $40 \times 0.30 = 12 \Rightarrow$ belongs to interval: $[62000, 124000[$

$$D_3 = 62000 + \left(\frac{12 - 8}{14} \right) \times 62000$$

$$= 79,714.28$$

Sentence - $\frac{1}{2}$

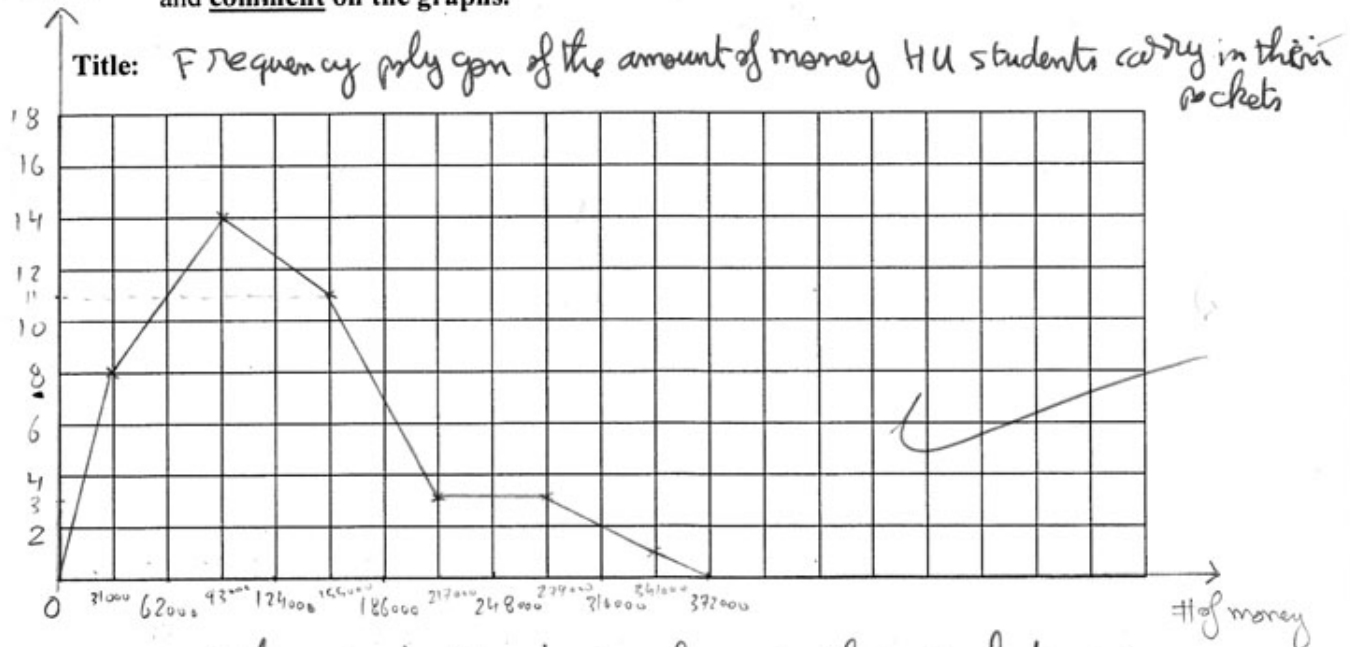
The 85th percentile location = $40 \times 0.85 = 34 \Rightarrow$ belongs to $[186000, 248000[$

$$P_{85} = 186000 + \left(\frac{34 - 33}{3} \right) \times 62000 = 206,667$$

Sentence - $\frac{1}{2}$

c. Represent this data graphically by drawing a polygone frequency and an Ogive and comment on the graphs.

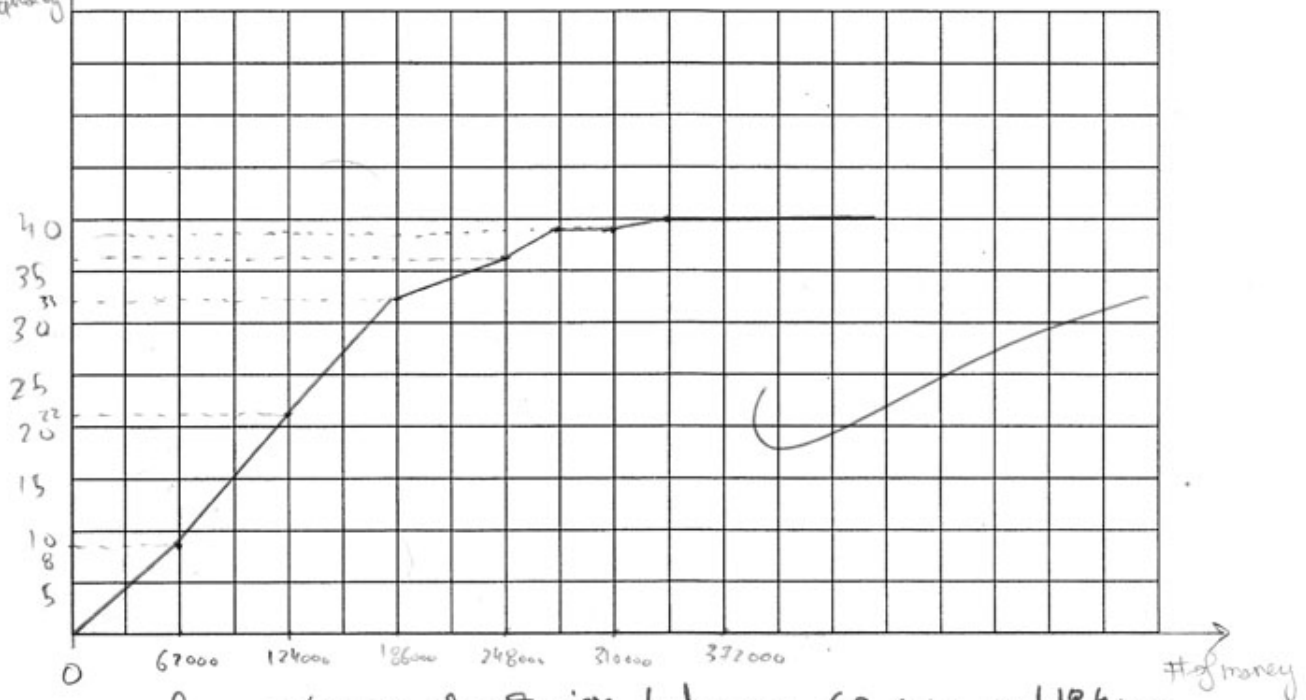
of students



most of the students at HU have in their pockets between 62000 and 124000 (highest frequency) and the distribution is right-skewed. And least of the students have in their pockets between 31000 and 372000.

5/

accumulative frequency
Title: Cumulative frequency polygon (ogive) for the amount of money H2U students have in their pockets



we have strong progression between 62 000 and 124 000
 and between 124 000, and 186 000

B. Then one of the students wanted to give as much details as possible and used the row data. (Parts d. to f. are related to the row data only)

Here is the same data again

0	45 000	83 000	35 000	45 000
50 000	50 000	60 000	65 000	70 000
125 000	130 000	140 000	145 000	160 000
75 000	80 000	30 000	90 000	90 000
160 000	160 000	165 000	210 000	215 000
93 000	101 000	102 000	103 000	110 000
115 000	122 000	125 000	125 000	125 000
222 000	250 000	261 000	270 000	371 000

d. Find the mean number of minutes students study a week.

$$\bar{x} = \frac{\sum x}{n} = 124,325$$

The average number of money in student pockets
 is 124,325 units

- e. Find the median number of minutes students study a week.

$$\text{location} = \frac{n+1}{2} = \frac{41}{2} = 20.5$$

$$\text{median} = 110000 + (115000 - 110000) \times 0.5 \quad \text{between } (110000, 115000)$$

$$= 112500$$

note: I sorted data from lowest to highest on back of the previous page

- f. Find the mode number of minutes students study a week.

The mode is 125000 (most popular among the distribution as it has the highest "frequency" & as it was ~~repeated~~ repeated the most (4 times))

4. The following Frequency Distribution represents the number of minute's students study before an exam.

Number of minutes	Frequency
Less than 30	2
30 up to 60	5
60 up to 120	14
120 up to 150	8
150 up to 270	8
270 up to 330	2
330 up to 420	1

unequal intervals.

Represent this data graphically by drawing a histogram and pie chart and comment after each graph. Use the space below for your explanation.

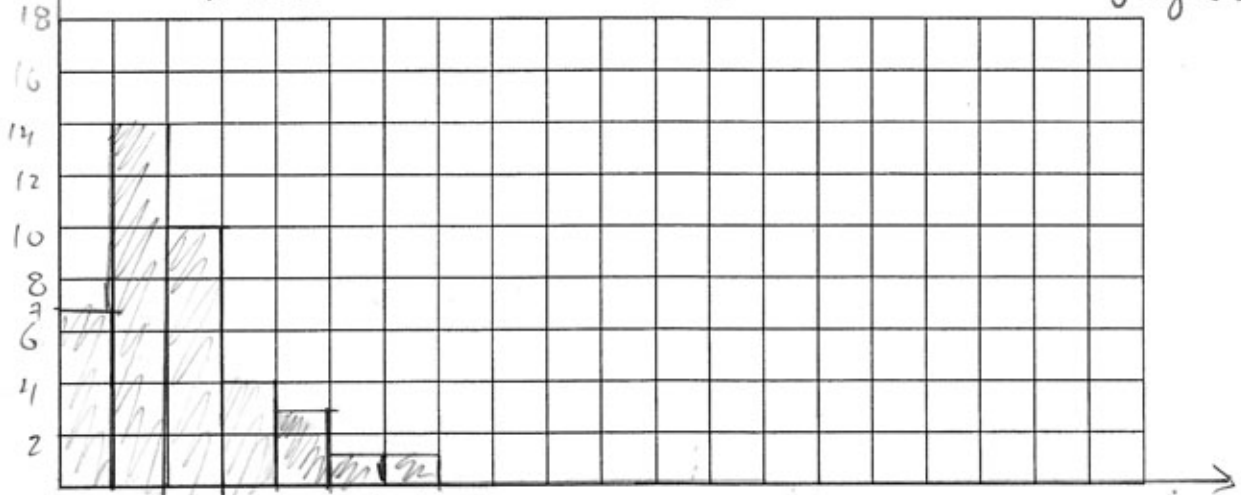
# of minutes	Frequency	M.P.	R.F.	angle
[0; 60[	7	30	17.5%	63°
[60; 120[	14	90	35%	126°
[120; 180[	10	150	25%	90°
[180; 240[	4	210	10%	36°
[240; 300[	3	270	7.5%	27°
[300; 360[	1	330	2.5%	9°
[360; 420[	1	390	2.5%	9°
	40		100%	360°

take size of interval to 7 classes

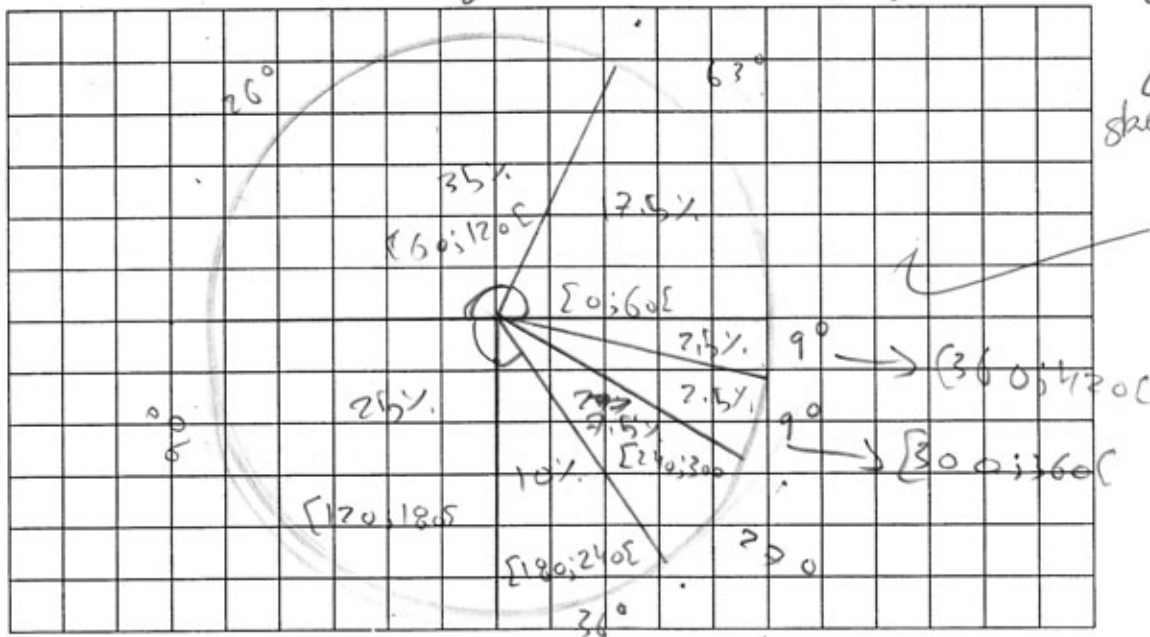
frequency

Title:

histogram of the amount of ~~money~~ ^{hours} ~~carrying in their~~ ^{study before exam} ~~study before exam~~



most of the students ~~carry in their pockets~~ ^{study between 60 and 120 minutes} and least of the students study between 300 and 360 and 360 and 420 min.
 Title: pie chart representing time students study before exam
 # of money
 skewness -1



comment. -2

PART II: Please circle the best answer for the following 5 Multiple Choice Questions.

1. According to Chebyshev's Theorem, what percent of the observations lie within plus and minus 1.25 standard deviations of the mean?

😊 95%

 64%

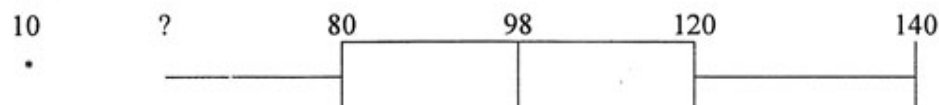
😊 92.5%

☺ 100%

☺ Cannot compute it depends on the shape of the distribution

☐ None of the above

2. The following box plot is not scaled. Find the missing number marked by a question mark.



60

☺ Cannot be computed, need more information

20

☺ None of the above

45

Use the following information to answer the following 3 questions:

The table lists the 1989 profits (in millions of dollars) for a sample of seven airlines.

Airline	Profit/Loss
Continental	3
Eastern	-852
Northwest	334
Pan Am	-414
TWA	-298
United	358

3. Calculate the range of the data set.

☺ 1,210 millions of \$

☺ - 848 millions of \$

494 millions of \$

☺ None of the above

☺ 855 millions of \$

4. Calculate the 3rd quartile.

☺ 334 millions of \$

😊 355.75 millions of \$

343.25 millions of \$

☺ None of the above

340 millions of \$

5. Calculate the 63rd percentile.

165.5 millions of \$

☺ 4.41 millions of \$

😊 165.91 millions of \$

☺ None of the above

☺ 138.71 millions of \$