**PROBLEM SESSION FOR STATISTICS I**

**Q1**. State whether each of following variables is qualitative or quantitative and indicate its measurement levels.

1. Annual sales
2. Soft drink size (small, medium, large)
3. Employee classification (GS1 through GS18)
4. Earnings per share
5. Method of payment (cash, check, credit card)
6. Dividend payment on stocks
7. Pepper hot scale

**Q2.** Ayva Technology Report provided information about home technology and its usage. The following data are the hours of personal computer usage during one week for a sample of 50 persons.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 5.1 | 2.5 | 11.4 | 6.9 | 4.4 | 6.7 | 2.6 | 7.1 | 4.0 | 4.7 |
| 4.1 | 5.8 | 3.0 | 15.8 | 6.4 | 5.2 | 4.9 | 5.1 | 12.1 | 4.5 |
| 5.1 | 5.1 | 9.8 | 6.6 | 5.3 | 4.3 | 8.1 | 11.3 | 7.2 | 8.6 |
| 11.8 | 3.8 | 10.5 | 13.9 | 13.1 | 1.7 | 5.0 | 10.2 | 5.4 | 6.7 |
| 8.2 | 7.1 | 6.7 | 6.9 | 5.7 | 4.9 | 4.7 | 4.1 | 7.1 | 4.1 |

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Summarize the data by constructing the following:

a. A frequency distribution (use a class width of three hours)

b. A relative frequency distribution

c. A histogram

d. An ogive

1. Comment on what the data indicate about personal computer usage at home.

**Q3.** A lecturer relies on his students in terms of not cheating in online-exams. However, he still wants to support this naïve thought with some statistics. Considering his past 10-years in-class exam grades, he gets mean, median and mode as 64, 60 and 50, respectively. The grouped data for the online exam is given as:

|  |  |
| --- | --- |
| **Grades** | **Frequency** |
| 20-<30 | 1 |
| 30-<40 | 2 |
| 40-<50 | 3 |
| 50-<60 | 4 |
| 60-<70 | 11 |
| 70-<80 | 18 |
| 80-<90 | 63 |
| 90-<100 | 107 |

Calculate cumulative frequency, relative frequency, cumulative relative frequency, mean, median, and mode? Based on the shape of distribution and the other statistics, shall he rely on his students?

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**Q4.** Mr. Brain works at a famous e-marketing company. Mr. Brain has received 5% wage increase at 2014 year beginning and 5% at the beginning of July. He is curious whether his wage protect its purchasing power. He collected monthly inflation data (Consumer Price Index) from The Turkish Statistical Institution (TURKSTAT) webpage as follow:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| CPI 2013 | 1,65 | 0,30 | 0,66 | 0,42 | 0,15 | 0,76 | 0,31 | -0,10 | 0,77 | 1,80 | 0,01 | 0,46 |
| CPI 2014 | 1,98 | 0,43 | 1,13 | 1,34 | 0,40 | 0,31 | 0,45 | 0,09 | 0,14 | 1,90 | - | - |

* 1. Construct a consumer price index that base time is December 2013 (December 2013=100). What is the inflation rate as a total for 10 months in 2014?
  2. Does the wage increase at the beginning of 2014 protect the purchasing power of Mr. Brain at the end of June? How much his real wage decreased or increased?
  3. Since Mr. Brain protect his purchasing power for year 2014, find the maximum average inflation rate for November 2014 and December 2014?

**Q5.** The fast-food restaurants monitor their drive-thru service times electronically to ensure that theirs speed of service is meeting the company’s goals. A sample of 15 drive-thru times was recently taken and is shown below for 2 fast-food restaurants.

**Speed of Service (time in minutes)**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Fast-Food**  **Company 1:** | 34 | 55 | 36 | 46 | 47 | 60 | 64 | 48 |
| 43 | 35 | 54 | 53 | 25 | 77 | 45 |  |
| **Fast-Food**  **Company 2:** | 24 | 22 | 38 | 37 | 35 | 28 | 44 | 35 |
| 33 | 46 | 51 | 42 | 34 | 32 | 68 |  |

1. Draw stem and leaf graph for each of these companies.
2. List the five-number summary for each of these companies.
3. Form the box-and-plot and compare methods with respect to –level, -dispersion, -shape and -outliers.
4. Develop a histogram for the frequency distributions of these companies.
5. Compute the mean speed of service for each company? Do you think this central tendency measures are suitable to these distributions? Why?