

# Mini project

[Science](#), [Statistics](#)



Mini Project Question one: The use of graphs in presenting information

Graphs are statistical tools that reveal the relationship between two or more research variables, each measured with and plotted along an axis at right angles. Graphs take different types and shapes depending on the researchers' objective and the type of data being presented. Graphs are important tools in transforming or communicating business data to its relevant users. The stakeholders need summarized data and a well-presented summary data that reflect the business health or the performance as they do not have time to go through the voluminous data. Therefore, such an idea gives the rationale of the use of graphs. The paper points two uses of graphs that are reflected in one of the business periodicals and their effectiveness.

First, an article from the Wall Street Journal dated 1st April that was written by Prince Marcelo reflected on the amount of gas and oil that comes from fracking in US. The graph points the trend of oil fracking as compared to the total oil and gas production from 2005 to 2015. Prince, (2015) makes use of a line graph to present the information that clearly shows that energy production from oil and gases has been increasing annually, same as the energy from fracking.

Graph 1: Showing oil production trend in US and associated fracking levels (WSJ, 2015).

Graph 2: Gas production trend in US and associated the fracking levels (WSJ, 2015).

The above graph is effective tool in revealing the current issue in the energy sector within the use of fracking technology. The black shaded area depicts the fracking amounts while the red one shows the total amounts of oil and gas production in US. It is clear that fracking has contributed to a larger percentage of both gas and oil production as opposed to the other sources of these two energy platforms. Additionally, the graph depicts the amounts (in estimate) of oil and gas every year, as well as, the periods that the trends revealed a sharp decrease or increase. Nevertheless, the difference or the ratio of the fracking to the total amounts can be easily calculated from the graph. Lastly, the mean or averages of the fracking amounts can be easily calculated; therefore, the graph shows the descriptive statistics for the data that can be highlighted without any struggle.

Another graph reflects the US quarterly GDP growth from 2012 to 2016. The article was posted by the Fed on 1st May 2015 and has forecasted the GDP growth rate of the US economy from 2012 to 2016. It shows the past GDP growth rates from 2012, the current rates and from these rates Fed can forecast the growth rates for the last quarter of 2015 and 2016. Therefore, the bar graph is effective tool that can be used in forecasting data for future use. This data is relevant to different cohorts of the economy ranging from actuaries to policy makers.

Graph 3: GDP growth rate for US economy for 2015 to 2016, (WSJ, 2015)

Question two: Descriptive statistics for GDP (Qatar) for ten years

Descriptive statistics

GDP (billions)

count

11

mean

103. 700

sample standard deviation

63. 021

sample variance

3, 971. 694

minimum

23. 5

maximum

202. 5

range

179

population variance

3, 610. 631

population standard deviation

60. 089

standard error of the mean

19. 002

confidence interval 95.% lower

61. 362

confidence interval 95.% upper

146. 038

half-width

42. 338

1st quartile

52. 700

median

97. 800

3rd quartile

147. 450

interquartile range

94. 750

mode

#N/A

low extremes

0

low outliers

0

high outliers

0

high extremes

0

Graphical presentation

Graph 4: Trend of Qatar QDP from 2003 to 2013

Observations

The mean GDP of Qatar from 2003 to 2014 is \$ 103. 7 billion, with a standard

deviation of \$ 67. 021, and a median of \$97. 800 billion. The minimum GDP was \$ 23. 5 and a maximum of 202. 5 with no extreme values. The GDP has been increasing gradually over the period. However, it decreased between 2008 and 2009. It can be forecasted that it will be higher than \$ 202. 5 billion in the following years.

Question 3: Response to 8. 67 & 8. 68

Part 8. 67

Probability that the project takes more than 60 days will be given as follows; Assume that the distribution takes a normal curve that the probability can be measured using the Z score and the standard deviations. From the data given, the mean number of days can be given as;  $\mu = 18 + 12 + 27 + 8 = 65$  days and the standard deviation can be given as  $\sigma^2 = 8^2 + 12^2 + 27^2 + 8^2 = 129$

Therefore, the  $\sigma = (129)^{1/2} = 11. 35$

Mean = 65, X= 60, SD = 11. 35

Measurement value = x = 60

Formula for Z - value =  $X - \mu / \sigma = 60 - 65 / 11. 35 = - 0. 4405$

From normal distribution table find P

Probability  $P(X > 60) = 0. 65957$

Part 8. 68

The Mean and variance of the distribution are given as 145 minutes and 31 minutes respectively, find the probability that it takes less than 2. 5 hours to overhaul the machine.

$\mu = 145$ ,  $\sigma = 31$  and X = 2. 5 hours (150 minutes)

Assuming a normal distribution then, find the Z score and the associated

probability from the normal distribution tables;

Find Z value =  $(X - \mu) / \sigma$

Z value =  $(150 - 145) / 31 = 0.1612$

$P(X < 150) = 0.871936$

Therefore, the probability that the exercise takes less than 2.5 hours is given as 0.871936.

#### References

Prince, M. (2015). How Much US Oil and Gas Comes From Fracking. Wall Street Journal. Retrieved from <http://blogs.wsj.com/corporate-intelligence/2015/04/01/how-much-u-s-oil-and-gas-comes-from-fracking/>

Macroeconomics. (2014), Gross Domestic Product in Qatar. Retrieved from [http://kushnirs.org/macro-economics/gdp/gdp\\_qatar.html](http://kushnirs.org/macro-economics/gdp/gdp_qatar.html)