**Task 2**

This task has two business problems (Task2a and Task2b) which you are required to answer.

**Task 2a**

In order to study the discount coupon offers the local mini market should offer, the company surveyed its loyal customers to know more about their expenditures on food. The amount spent on food in that particular mini market was recorded as below:

|  |  |
| --- | --- |
| **Expenditure on food (£) – per one visit** | **Number of respondents** |
| under than £5 | 2 |
| £5 but under £10 | 6 |
| £10 but under £15 | 8 |
| £15 but under £20 | 12 |
| £20 but under £30 | 10 |
| £30 but under £40 | 4 |
| £40 and more | 2 |
| **Total** | **44** |

**Task 2b**

The personnel department of a company has developed an aptitude test for screening potential employees. The person who devised the test asserted that the mean mark attained would be 100 out of 120. A survey of 13 random applications showed that their mean mark was 96 with a standard deviation of 5.2.

**Your tasks are defined as follows:**

1. **Referring to Task2a: Perform data analysis (all measures of location and dispersion discussed in class) and graphically demonstrate your measures – if applicable. Referring to Task2b: Carry out a test at 1% level to suggest if there is sufficient evidence to suggest that the mean mark is less than 100. *(2.1)***
2. Interpret all of the measures you have calculated in **Task2a,** and draw some conclusions that statistically summarizes the customers’ one off expenditure on food and suggest to the Higher Management above which amount should they offer the customers a discount and why. ***(2.3)***
3. ***Optional:*** For each measure give at least one advantage and one disadvantage.

***Your answer must be divided into two separate tasks: Task2a and Task2b.***

**Task 3**

The gross monthly sales volume for a corporation is not subject to substantial seasonal variation. The corporation is interested to see if their advertising is helping in boosting their sales. The below table shows a sample of advertising expenditures and sales volumes for ten randomly selected months.

|  |  |  |
| --- | --- | --- |
| **Month** | **Advertising (**£**’0000)** | **Sales Volume (£’0000)** |
| 1 | 1.2 | 101 |
| 2 | 0.8 | 92 |
| 3 | 1.0 | 110 |
| 4 | 1.3 | 120 |
| 5 | 0.7 | 90 |
| 6 | 0.8 | 82 |
| 7 | 1.0 | 93 |
| 8 | 0.6 | 75 |
| 9 | 0.9 | 91 |
| 10 | 1.1 | 105 |

**Your tasks are defined as follows:**

1. Plot a scatter diagram and calculate the correlation coefficient to see if there is any association between the sales volume and the amount of money spent on advertising and then comment on your findings. Find the quartiles and percentiles of any of the two series, and suggest how much (could be a range) should the corporation spend on its advertising in the following month. Do you think the quartiles and percentiles are an adequate measure to make this decision? ***(2.4)***
2. Using the Ordinary least square method to find the line of best fit and plot it. Calculate the coefficient of determination and interpret all of your findings. Then, use your regression line to forecast the gross monthly sales the corporation would generate if it decided to spend £12,000 on advertising in that particular month. ***(2.2)***

To summarize. For Task 1 you have to prepare an organized report for Mr George Lightfoot containing the planning of the collection of data; also the report must contain the actual questionnaire. For Tasks 2 and 3 a suitable solution to the given problems must be given in a professional format.