Case Study – Data Cleansing

Question Appeared in: ModelOff 2014 Round 1

Time Allocated: 35 minutes

INTRODUCTION

Just over a year ago you had a smart electricity meter installed at your home. This particular model of smart meter reports your usage to your electricity provider every hour. Your electricity contract is due for renewal and being a top financial analyst you decide to identify which contract will minimise your annual electricity cost.

There are 3 different types of electricity contracts available to you. Each are described in the table below:

Plan	Explanations
No Flex	The cost per kWh of electricity is constant for the entire year
Monthly Flex	The cost per kWh of electricity fluctuates depending on the month
Hourly Flex	The cost per kWh of electricity fluctuates based on the time of day

To decide which contract is optimal, you decide to compare the costs under each of the contracts assuming your usage remains exactly the same as last year. You've contacted your current electricity supplier to obtain your electricity usage history for the last year. Unfortunately they provided it to you in a poorly structured and unsorted format, so you will need to clean it up prior to doing your analysis. In the data the hour field identifies when the hour starts, so 8AM would be from 8:00AM until 8:59AM.

SUPPORTING DATA

You've placed your usage history and the specifics of each of the electricity contracts into the supplied workbook. Your usage history is located on the "Usage" sheet while the specifics about each of the electricity contracts is located on the "Contracts" sheet.

QUESTIONS

Question 1

What is your average hourly electricity usage?

a. 0.641kWh

b. 0.782kWh

c. 0.884kWh

d. 0.937kWh

Question 2

What is your average electricity usage per hour in February?

a. 0.760kWh

b. 0.784kWh

c. 0.808kWh

d. 0.833kWh

Question 3

Which day of the week has the highest average usage?

a. Sunday

b. Monday

c. Tuesday

d. Wednesday

Question 4

What is the highest amount of electricity used in a <u>continuous</u> 4 hour period?

a. 17.237kWh

b. 17.327kWh

c. 17.422kWh

d. 17.487kWh

Question 5

Based on your historic electricity usage, what would your annual cost of electricity be under the "Monthly Flex" contract?

a. $1350.73

b. $1421.82

c. $1450.26

d. $1493.77

Question 6

Based on your historic electricity usage, what would your annual cost of electricity be under the "Hourly Flex" contract?

a. $1369.36

b. $1376.48

c. $1389.67

d. $1396.75

Question 7

Based on your historic electricity usage, which of the three contracts would produce the lowest annual cost?

a. The No Flex plan

b. The Monthly Flex plan

c. The Hourly Flex plan

d. Impossible to Determine

Answers

1	B
2	D
3	A
4	A
5	B
6	A
7	C