I pledge on my honor that I have not given or received any unauthorized assistance on this

assignment/examination. I further pledge that I have not copied any material from a book, article,

the Internet or any other source except where I have expressly cited the source.

Signature: Kanika Yadav

Date: 09/22/2022

Topic name -

Name - Kanika Yadav

Date: September 22, 2022

W&A Chapter - 3

Question No – Q18 & Q 34

Page no – 117 & 124

W&A **Chapter 4**

**1. General Flakes**

4Edition Q4 **or** 3Edition Q4

Some data of the original problem is modified, please use the following data instead

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Soap | MNF | Simp -sons | Sports | Real World | Movie | CNN | Law & Order |  | Required Exposures |
| Men 18-35 | 2 | 6 | 6 | 0.5 | 0.7 | 0.1 | 0.1 | 3 |  | 30 |
| Men 36-55 | 3 | 5 | 4 | 0.5 | 0.2 | 0.1 | 0.2 | 5 |  | 20 |
| Men >55 | 2 | 3 | 0 | 0.3 | 0 | 0 | 0.3 | 4 |  | 10 |
| Women 18-35 | 6 | 1 | 4 | 0.1 | 0.9 | 0.6 | 0.1 | 3 |  | 60 |
| Women 36-55 | 5 | 1 | 2 | 0.1 | 0.1 | 1.3 | 0.2 | 5 |  | 60 |
| Women >55 | 2 | 1 | 0 | 0 | 0 | 0.4 | 0.3 | 4 |  | 28 |
|  |  |  |  |  |  |  |  |  |  |  |
| Cost per ad | 140 | 100 | 100 | 9 | 13 | 15 | 8 | 140 |  |  |

**Ans.**

Management Overview

**Problem Statement:**Suppose that General Flakes decides that it shouldn’t place any more than 10 ads on any given show. Modify the (original) advertising model appropriately to incorporate this constraint, and then reoptimize (with integer constraints on the numbers of ads). Finally, run SolverTable to see how sensitive the optimal solution is to the maximum number of ads per show allowed. You can decide on a reasonable range for the sensitivity analysis.

**Data Sources:**

As given in the problem statement above.

**Model Approach:**

Solver Table based sensitivity optimization based on target objective to minimize the total number of exposures to each viewer group. The company will be able to decide how many ads to place on each television show. The Only constraint other than non-negativity is that there must be at least the required number of exposures for each group.

**Solution & Sensitivity Analysis:**

As per the solution result in the excel sheet, the company is not currently purchasing any ads on “MNF”, “CNN” and “Sports Center”. The reduced cost for this shows that the cost per ad for highest for “Desperate Housewives” and “Law & Order SVU”.

The Men in range 36-55 age range are having 37.426 exposures to the total ads. Although the shadow price is null for both men 36-55 and men>55.

From the sensitivity report, it is observed that for variable cells of no of ads we have 0 value of MNF, Sport Center and CNN whereas the reduced cost falls on the greater side.

As per the constraints we have two – The number of ads should not exceed maximum number of ads i.e. 10 as per problem statement. And Actual exposure per individual should be greater than the required exposure for each category of individuals.

Since we limit here maximum number of ads to 10 the resultant distribution of ads varies for their respective number of purchases made.

**Conclusion:**

The total cost can be said to be minimized to - $1,551.277

**2. DEA**

4Edition Q42 **or** 3Edition Q42

original data is modified as the following

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Inputs used for outputs produced | | | |  |  |  |
| School | Input 1 | Input 2 | Input 3 | Output 1 | Output 2 | Output 3 |
| 1 | 20 | 4 | 0.05 | 8 | 12 | 12 |
| 2 | 10 | 2 | 0.03 | 10 | 8 | 9 |
| 3 | 11 | 2 | 0.06 | 11 | 11 | 11 |
| 4 | 9 | 2 | 0.06 | 9 | 12 | 12 |

**Management Overview**

**Problem Statement:**You have been commissioned by Indiana University to evaluate the relative efficiency of four degree-granting units: Business, Education, Arts and Sciences, and Health, Physical Education, and Recreation (HPER). You are given the information in the file P04\_44.xlsx. Use DEA to identify all inefficient units.

**Data Sources:**

file P04\_44.xlsx

**Model Approach:**

The DEA approach

**Solution Analysis:**

Using DEA analysis we determine for each school details to be efficient or not.

* No school can be more than 100% efficient. Therefore, the efficiency of each school is constrained to be less than or equal to 1.
* When determining whether a school is efficient it is useful to scale input prices so that the value of the hospitals inputs equals 1. Any other value would suffice, but using 1 causes the efficiency of school to be equal to value of schools outputs
* To put a given school in its best light, the input costs and output prices should be chosen to maximize this school’s efficiency. If the schools efficiency equals 1, the school is efficient; if the schools efficiency is less than 1, the school is inefficient.
* All input costs and output prices must be nonnegative.

**Conclusion:**

For School 1 the Efficiency is 0.9 and all other schools have efficiency of 1 which means as per DEA that these are the efficient schools with the help of DEA.