



#### **Synopsis**

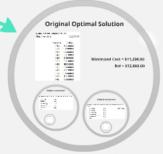
Cookie man- Exploring New Frontiers Harvard AmeriBank is trying to determine how create a more convenient transaction method based **Case Solution & Analysis** 

TheCaseSolutions.com



around online banking for their customers

- They intend to survey people near their area to get an idea of to conduct their online banking based on their customer demographic
- They are looking to hire the surveying company that can perform the survey for the least cost







#### **Synopsis**

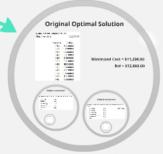
Cookie man- Exploring New Frontiers Harvard AmeriBank is trying to determine how create a more convenient transaction method based **Case Solution & Analysis** 

TheCaseSolutions.com



around online banking for their customers

- They intend to survey people near their area to get an idea of to conduct their online banking based on their customer demographic
- They are looking to hire the surveying company that can perform the survey for the least cost



## **Synopsis**

AmeriBank is trying to determine how create a more convenient transaction method based around online banking for their customers

- They intend to survey people near their area to get an idea of to conduct their online banking based on their customer demographic
- They are looking to hire the surveying company that can perform the survey for the least cost

### **Sophisticated Surveys**

Sophisticated Surveys is a surveying company competing for the project

We intend to minimize the cost of the project by creating a linear model

Our bid will be 115% of the cost of the project

### **Given Constraints**

- The company would like to survey people in four different age groups and from three different types of towns
- 2,000 people were to be surveyed, given a minimized percentage of the total of people surveyed in the given age group and town

18-25 Age Group: 20% 26-40 Age Group: 27.5% 41-50 Age Group: 15% 51 and over Age Group: 15%

Silicon Valley: 15% Big Citles: 35% Small Towns: 20%

### **Given Constraints**

- The company would like to survey people in four different age groups and from three different types of towns
- 2,000 people were to be surveyed, given a minimized percentage of the total of people surveyed in the given age group and town

18-25 Age Group: 20%

26-40 Age Group: 27.5%

41-50 Age Group: 15%

51 and over Age Group: 15%

Silicon Valley: 15%

Big Cities: 35%

**Small Towns: 20%** 

### **Linear Model**

For  $x_{ij}$ : number of people surveyed in age group *i* from region *j* 

 $\textit{Minimize} \ Z = 4.75x_{11} + 6.5x_{21} + 6.5x_{31} + 5x_{41} + 5.25x_{12} + 5.75x_{22} + 6.25x_{32} + 6.25x_{42} + 6.5x_{13} + 7.5x_{23} + 7.5x_{33} + 7.25x_{43}$ 

subject to,  $x_{11}+x_{12}+x_{13} \ge 400$ 

 $X_{21}+X_{22}+X_{23} \ge 550$ 

 $X_{31}+X_{32}+X_{33} \ge 300$ 

 $X_{41}+X_{42}+X_{43} \ge 300$ 

 $X_{11}+X_{21}+X_{31}+X_{41} \ge 300$ 

 $X_{12}+X_{22}+X_{32}+X_{42} \ge 700$ 

 $X_{13}+X_{23}+X_{33}+X_{43} \ge 400$ 

 $X_{11}+X_{21}+X_{31}+X_{41}+X_{12}+X_{22}+X_{32}+X_{42}+X_{13}+X_{23}+X_{33}+X_{43}=2000$ 

 $x_{ij} \ge 0$ , for all i = 1, 2, 3, 4 and j = 1, 2, 3

# Linear Model

For  $x_{ij}$ : number of people surveyed in age group i from region j

Minimize  $Z = 4.75x_{11} + 6.5x_{21} + 6.5x_{31} + 5x_{41} + 5.25x_{12} + 5.75x_{22} + 6.25x_{32} + 6.25x_{42} + 6.5x_{13} + 7.5x_{23} + 7.5x_{33} + 7.25x_{43}$ 

subject to, 
$$x_{11}+x_{12}+x_{13} \ge 400$$
  
 $x_{21}+x_{22}+x_{23} \ge 550$   
 $x_{31}+x_{32}+x_{33} \ge 300$   
 $x_{41}+x_{42}+x_{43} \ge 300$   
 $x_{11}+x_{21}+x_{31}+x_{41} \ge 300$   
 $x_{12}+x_{22}+x_{32}+x_{42} \ge 700$   
 $x_{13}+x_{23}+x_{33}+x_{43} \ge 400$   
 $x_{11}+x_{21}+x_{31}+x_{41}+x_{12}+x_{22}+x_{32}+x_{42}+x_{13}+x_{23}+x_{33}+x_{43} = 2000$   
 $x_{ij} \ge 0$ , for all  $i = 1, 2, 3, 4$  and  $j = 1, 2, 3$ 

### **Original Optimal Solution**

Global optimal solution found.

Objective value: 11,200.00

Variable	Value
X11	600.0000
X21	0.000000
X31	0.000000
X41	300.0000
X12	0.000000
X22	550.0000
X32	150.0000
X42	0.000000
X13	250.0000
X23	0.000000
X33	150.0000
X43	0.000000

Minimized Cost = \$11,200.00 Bid = \$12,880.00

#### Added Constraint

Mahala: Z = 4,750;;; (5,50); (6,50); (5,0); (5,250); (5,750); (6,250); (6,30); (7,50); (7,50); (7,250); (7,250); (7,50

911 (912   916 2 400)	x1125
911400010042 550	20125
#21,*#22*#20 / 830	Name of the
sp. (san) san2500	X21.2.5
311400140040a12500	20112.5
\$12+002+032+04; 2 700	2012.5
not ison ison sure 400	Att 2 5
an isomer same or an action is	X412.5
940029+039+049*2000	24125
nn 250	A41 2 5
sip 2:50	



#### **Added Constraint**

Minimize Z = 4.75x11+6.5x12+6.5x12+5.5x12+5.25x12+5.75x12+6.25x12+6.25x12+6.5x12+7.5x12+7.5x12+7.25x1 milyent te;

x11+x12+x152-400	x13 2 50	#13+X12+#135 600
#21+#22+#252/5/5/0	#21 2 SO	#11+#21+#51+#5#5#
Nauthauthaut 300	×22 ≥ 50	
xar+xar+xas2300	×21 ≥ 50	
*11***********************************	Xxx 2:50	
X12**X22*X32**K22* 700	X12 2 50	
x13+x25+x35+x62 400	#55 2 50	
alleaditeditemitalisationalisation	Naj 2:50	
5+x22+x22+x42*2000	R42 2:50	
×11250	Xan ≥ 50	
X12 2:50		

