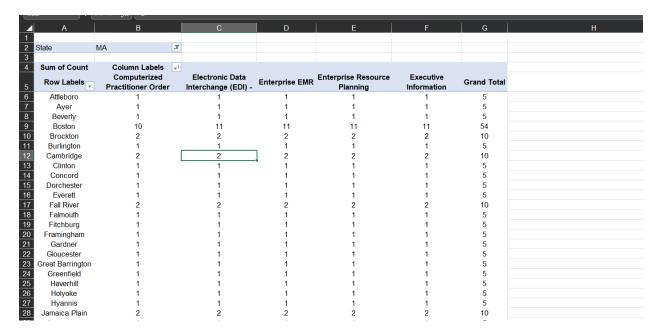# Tutorial 3 Solutions :

1) Use the HMIS_Tutorial_Three.xlsx workbook from the Week 04 Module. Note: Add a column (attribute) in the workbook named Count and place the value of 1 in each row of Count.
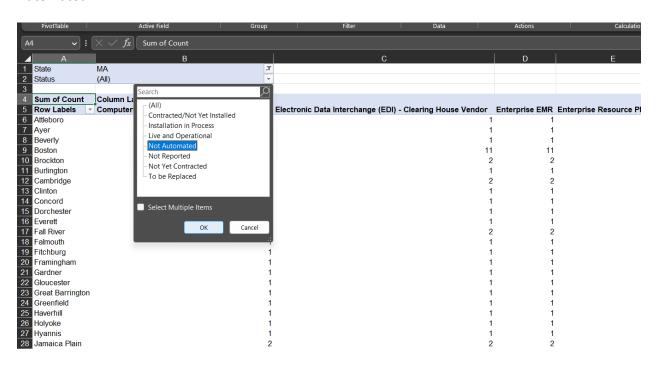
	C	D	E	F	G	H	I
	City	State	Zip	Application	Status	Count	
2	ma Linda	CA	92354	Computerized Practitioner Order Entry (CPOE)	Live and Operational	1	
3	ma Linda	CA	92354	Electronic Data Interchange (EDI) - Clearing House	Not Automated	1	
4	ma Linda	CA	92354	Enterprise EMR	Live and Operational	1	
5	ma Linda	CA	92354	Enterprise Resource Planning	Not Automated	1	
6	ma Linda	CA	92354	Executive Information System	Live and Operational	1	
7	ma Linda	CA	92354	Computerized Practitioner Order Entry (CPOE)	Live and Operational	1	
8	ma Linda	CA	92354	Electronic Data Interchange (EDI) - Clearing House	Not Automated	1	
9	ma Linda	CA	92354	Enterprise EMR	Live and Operational	1	
0	ma Linda	CA	92354	Enterprise Resource Planning	Not Automated	1	
1	ma Linda	CA	92354	Executive Information System	Live and Operational	1	
2	ndale	AZ	85308	Computerized Practitioner Order Entry (CPOE)	Contracted/Not Yet Installed	1	
3	ndale	AZ	85308	Electronic Data Interchange (EDI) - Clearing House	Not Automated	1	
4	ndale	AZ	85308	Enterprise EMR	Not Automated	1	
5	ndale	AZ	85308	Enterprise Resource Planning	Not Automated	1	
6	ndale	AZ	85308	Executive Information System	Live and Operational	1	
7	lhead City	AZ	86442	Computerized Practitioner Order Entry (CPOE)	Not Automated	1	
8	lhead City	AZ	86442	Electronic Data Interchange (EDI) - Clearing House	Live and Operational	1	
9	lhead City	AZ	86442	Enterprise EMR	Not Automated	1	

2)

a.

List the count of HMIS applications by city for hospitals in Massachusetts (MA).

	A	B	C	D	E	F	G	H
1								
2	State	MA						
3								
4	Sum of Count	Column Labels						
5	Row Labels	Computerized Practitioner Order	Electronic Data Interchange (EDI) -	Enterprise EMR	Enterprise Resource Planning	Executive Information	Grand Total	
6	Attleboro	1	1	1	1	1	5	
7	Ayer	1	1	1	1	1	5	
8	Beverly	1	1	1	1	1	5	
9	Boston	10	11	11	11	11	54	
10	Brockton	2	2	2	2	2	10	
11	Burlington	1	1	1	1	1	5	
12	Cambridge	2	2	2	2	2	10	
13	Clinton	1	1	1	1	1	5	
14	Concord	1	1	1	1	1	5	
15	Dorchester	1	1	1	1	1	5	
16	Everett	1	1	1	1	1	5	
17	Fall River	2	2	2	2	2	10	
18	Falmouth	1	1	1	1	1	5	
19	Fitchburg	1	1	1	1	1	5	
20	Framingham	1	1	1	1	1	5	
21	Gardner	1	1	1	1	1	5	
22	Gloucester	1	1	1	1	1	5	
23	Great Barrington	1	1	1	1	1	5	
24	Greenfield	1	1	1	1	1	5	
25	Haverhill	1	1	1	1	1	5	
26	Holyoke	1	1	1	1	1	5	
27	Hyannis	1	1	1	1	1	5	
28	Jamaica Plain	2	2	2	2	2	10	

b. List the count of HMIS applications in hospitals by state for the application status 'Not Automated.'

A	B	C	D	E
State	MA			
Status	(All)			
Sum of Count	Column La...			
Row Labels	Computer...	Electronic Data Interchange (EDI) - Clearing House Vendor	Enterprise EMR	Enterprise Resource Pl...
Attleboro		1	1	
Ayer		1	1	
Beverly		1	1	
Boston		11	11	
Brockton		2	2	
Burlington		1	1	
Cambridge		2	2	
Clinton		1	1	
Concord		1	1	
Dorchester		1	1	
Everett		1	1	
Fall River		2	2	
Falmouth		1	1	
Fitchburg	1	1	1	
Framingham	1	1	1	
Gardner	1	1	1	
Gloucester	1	1	1	
Great Barrington	1	1	1	
Greenfield	1	1	1	
Haverhill	1	1	1	
Holyoke	1	1	1	
Hyannis	1	1	1	
Jamaica Plain	2	2	2	

Search dropdown:
- (All)
- Contracted/Not Yet Installed
- Installation in Process
- Live and Operational
- Not Automated
- Not Reported
- Not Yet Contracted
- To be Replaced

☐ Select Multiple Items   OK   Cancel

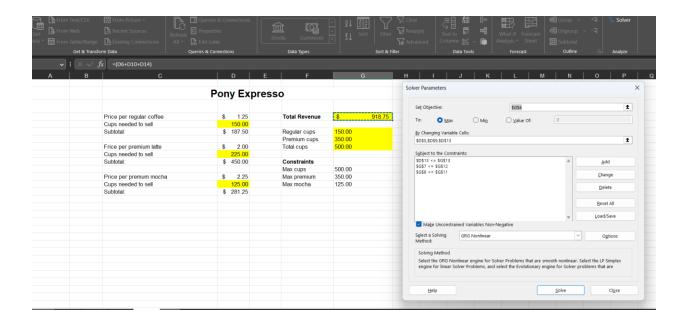| A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
Status	Not Automated																							
Sum of Count	Column Labels																							
Row Labels	AK	AL	AR	AZ	CA	CN	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS	KY	LA	MA	MD	ME	MI
Computerized Practitioner Order Entry (CPOE)	8	60	49	37	214		36	12	6	3	143	77	10	50	14	102	64	50	74	96	37	24	9	51
Electronic Data Interchange (EDI) - Clearing House Vendor	6	43	32	38	197	1	25	14	6	5	83	53	14	41	18	86	46	48	58	49	54	35	17	52
Enterprise EMR	1	36	31	29	136		35	16	2	4	97	47	11	33	8	59	45	42	54	46	22	7	12	46
Enterprise Resource Planning	8	65	53	40	269	1	30	27	8	6	136	101	14	62	20	131	93	52	71	76	70	31	27	95
Executive Information System	2	21	24	22	134	1	21	10	2	5	47	25	12	35	3	63	42	35	25	33	17	10	18	56
Grand Total	25	225	189	166	950	3	147	79	24	23	506	303	61	221	63	441	290	227	282	300	200	107	83	300

c. List the count of HMIS applications by hospital in Massachusetts for the application status 'Live and Operational.'

	A	B	C	D	E	F	G
1	State	(All)					
2	Status	Live and Operational					
3							
4	**Sum of Count**	Column Label					
5	**Row Labels**	Computerized P	Electronic Data Int	Enterprise EMR	Enterpris	Executive Information	Grand Total
6	Abbeville County Memorial Hospital					1	1
7	Abilene Regional Medical Center		1			1	2
8	Abington Memorial Hospital	1		1	1	1	4
9	Abraham Lincoln Memorial Hospital		1	1		1	3
10	Addison Gilbert Hospital	1				1	2
11	Adena Regional Medical Center			1		1	2
12	Adventist Medical Center			1		1	2
13	Advocate Bethany Hospital	1		1	1		3
14	Advocate Christ Medical Center	1		1	1		3
15	Advocate Good Samaritan Hospital		1	1	1		3
16	Advocate Good Shepherd Hospital	1	1	1	1		4
17	Advocate Illinois Masonic Medical Center	1	1	1	1		4
18	Advocate Lutheran General Hospital	1	1	1	1		4
19	Advocate South Suburban Hospital	1	1	1	1		4
20	Advocate Trinity Hospital		1	1	1		3
21	Aiken Regional Medical Centers	1		1			2
22	Akron Childrens Hospital			1		1	2
23	Akron City Hospital					1	1
24	Akron General Medical Center			1	1	1	3
25	Alamance Regional Medical Center	1	1	1		1	4
26	Alameda Hospital		1	1		1	3
27	Alaska Native Medical Center		1	1			2
28	Alaska Regional Hospital					1	1
29	Albany Area Hospital & Medical Center					1	1

Solver : Pony Expresso

Pony Expresso

Price per regular coffee	$ 1.25	**Total Revenue** $ 918.75
Cups needed to sell	150.00	
Subtotal:	$ 187.50	Regular cups 150.00
		Premium cups 350.00
Price per premium latte	$ 2.00	Total cups 500.00
Cups needed to sell	225.00	
Subtotal:	$ 450.00	**Constraints**
		Max cups 500.00
Price per premum mocha	$ 2.25	Max premium 350.00
Cups needed to sell	125.00	Max mocha 125.00
Subtotal:	$ 281.25	

Solver Parameters ✕

Set Objective: G4

To: ● Max ○ Min ○ Value Of: 0

By Changing Variable Cells:
D5,D9,D13

Subject to the Constraints:
D13 <= G13
G7 <= G12
G8 <= G11

[Add] [Change] [Delete] [Reset All] [Load/Save]

☑ Make Unconstrained Variables Non-Negative

Select a Solving Method: GRG Nonlinear [Options]

Solving Method
Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for linear Solver Problems, and select the Evolutionary engine for Solver problems that are

[Help] [Solve] [Close]

Advertising Mix scenario :

	Radio spots	

Advertising Mix

Price of TV advertising	$ 2,000.00	Total Audience	1,131,351.35
Audience of TV advertising	100,000	Total Advertising Cost	$ 18,200.00
TV advertising spots	2.5		
Subtotal TV Cost	$ 4,918.92	TV spots	2.5
Subtotal TV Audience	245,946	Radio spots	0.0
		Newspaper spots	22.1
Price of radio advertising	$ 3,000.00	Total advertising spots	24.6
Audience of Radio advertising	18,000		
Radio advertising spots	0	Constraints	
Subtotal Radio Cost	$ –		
Subtotal Radio Audience	–	Max advertising budget	$ 18,200.00
		Max radio spots is half of total ad spots	12.3
Price of Newspaper advertising	$ 600.00	Min TV spots is 10% of total ad spots	2.5
Audience of Newspaper advertising	40,000	Max TV spots	10
Newspaper advertising spots	22.1	Max Radio spots	20
Subtotal Newspaper Cost	$13,281.08	Max Newspaper spots	30
Subtotal Newspaper Audience	885,405.40		

Solver Parameters

Set Objective: G4   [Max]

To: ● Max ○ Min ○ Value Of: 0

By Changing Variable Cells:

D6,D12,D18

Subject to the Constraints:

G5 <= G14
G7 <= G17
G7 >= G16
G8 <= G15
G8 <= G18
G9 <= G19

[Add] [Change] [Delete] [Reset All] [Load/Save]

☑ Make Unconstrained Variables Non-Negative

Select a Solving Method: GRG Nonlinear   [Options]

Solving Method
Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for linear Solver Problems, and select the Evolutionary engine for Solver problems that are non-smooth.

[Help] [Solve] [Close]

Bicycle Scenario :

Bicycle Frames

Profit on delux frames	$ 10.00	**Total Profit:** $415.00
Delux frames to produce	16	
Subtotal:	$160.00	
Profit on professional frames	$ 15.00	Delux frames 16
Delux frames to produce	17	Professional Frames 17
Subtotal:	$255.00	Total Alum Alloy 100
		Total Steel 80
		Constraints
		Max. Alum Alloy/week 100
		Max. Steel/week 80

Transportation :

`=D4+(2*D8)+(3*D12)+(4*D16)+(5*D20)+(6*D24)`

B	C	D	E	F	G
	Transportation Solver				
	Cost per unit from Kansas City to Region 1 $	2.10		Total Transportation Costs $	52.40
	Units to ship from Kansas City to Region 1	33.3333334			
	Subtotal of Kansas City to Region 1 Transportation $	70.00		Kansas City Production	500 5,9,13
				Louisville Production	333 17,21,25
	Cost per unit from Kansas City to Region 2 $	2.25		Total Production	833
	Units to ship from Kansas City to Region 2	166.666667			
	Subtotal of Kansas City to Region 2 Transportation $	375.00		Region 1 Shipments	200 d5+d17
				Region 2 Shipments	333.333334 d9+d21
	Cost per unit from Kansas City to Region 3 $	3.00		Region 3 Shipments	300.0000006 d13+d25
	Units to ship from Kansas City to Region 3	300.0000006			
	Subtotal of Kansas City to Region 3 Transportation $	900.00		**Constraints**	
				Max Kansas City Production	500
	Cost per unit from Lexington to Region 1 $	2.00		Max Louisville Production	400
	Units to ship from Louisville to Region 1	166.666667		Region 1 Demand	200
	Subtotal of Louisville to Region 1 Transportation $	333.33		Region 2 Demand	250
				Region 3 Demand	300
	Cost per unit from Lexington to Region 2 $	2.40			
	Units to ship from Louisville to Region 2	166.666667			
	Subtotal of Louisville to Region 2 Transportation $	400.00			
	Cost per unit from Lexington to Region 3 $	2.80			
	Units to ship from Louisville to Region 3				
	Subtotal of Louisville to Region 3 Transportation $	-			

Solver Parameters

Set Objective: `$G$4`

To: ○ Max ● Min ○ Value Of: `0`

By Changing Variable Cells:
`$D$5,$D$9,$D$13,$D$17,$D$21`

Subject to the Constraints:
```
$G$10 >= $G$17
$G$11 >= $G$18
$G$12 >= $G$19
$G$6 <= $G$15
$G$7 <= $G$16
```

[Add] [Change] [Delete] [Reset All] [Load/Save]

☑ Make Unconstrained Variables Non-Negative

Select a Solving Method: `GRG Nonlinear` [Options]

Solving Method

Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for linear Solver Problems, and select the Evolutionary engine for Solver problems that are non-smooth.

[Help] [Solve] [Close]