

CSC 101 - Prof. Richard B. Goldstein - Spreadsheet Homework #3

You will be given a spreadsheet called states.xls. It looks like:

	A	B	C	D	E	F	G	H
1	File: states.xls							
2					2000	2003	median ages (2000)	
3	State	1940 Pop	2000 Pop	Sq. Miles	% Urban	per cap inc	female	male
4	Alabama	2,832,961	4,447,100	50,750	60.4	26,338	34.4	37.2

The last row #55 has the Total USA data. The final spreadsheet looks like:

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O					
1	File: statesall.xls																			
2					2000	2003	median ages (2000)													
3	State	1940 Pop	2000 Pop	Sq. Miles	% Urban	per cap inc	female	male	% pop change	rank pop ch	pop/sq m	rank ppsqm	inc rank	med age	rank age					
4	Alabama	2,832,961	4,447,100	50,750	60.4	26,338	34.4	37.2	57.0%	34	87.6	25	41	35.8	26					
5	Alaska	72,524	626,932	570,374	67.5	33,568	32.4	32.5	764.4%	3	1.1	1	13	32.4	3					
53	Wisconsin	3,137,587	5,363,675	54,314	65.7	30,898	35.0	37.1	70.9%	29	98.8	27	21	36.0	33					
54	Wyoming	250,742	493,782	97,105	65.0	32,808	35.3	37.1	96.9%	23	5.1	2	16	36.2	37					
55	Total USA	132,164,569	281,421,906	3,536,281	75.2	31,632	34.0	36.6	112.9%		79.6			35.3						
56																				
57																				
58	State	1940 Pop	2000 Pop	Sq. Miles	% Urban	per cap inc	female	male	% pop change	rank pop ch	pop/sq m	rank ppsqm	inc rank	med age	rank age					
59		<10000000	>10000	<75	>30000									<36						
60																				
61																				
62	State	1940 Pop	2000 Pop	Sq. Miles	% Urban	per cap inc	female	male	% pop change	rank pop ch	pop/sq m	rank ppsqm	inc rank	med age	rank age					
63	Alaska	72,524	626,932	570,374	67.5	33,568	32.4	32.5	764.4%	3	1.1	1	13	32.4	3					
68																				
69																				
70	State	1940 Pop	2000 Pop	Sq. Miles	% Urban	per cap inc	female	male	% pop change	rank pop ch	pop/sq m	rank ppsqm	inc rank	med age	rank age					
71		<10000000	>10000	<75	>30000									<36						
72				<60	>34000															
73																				
74	State	1940 Pop	2000 Pop	Sq. Miles	% Urban	per cap inc	female	male	% pop change	rank pop ch	pop/sq m	rank ppsqm	inc rank	med age	rank age					
75	Alaska	72,524	626,932	570,374	67.5	33,568	32.4	32.5	764.4%	3	1.1	1	13	32.4	3					
76	Michigan	5,256,106	9,938,444	56,809	70.5	30,439	34.3	36.6	89.1%	25	174.9	36	25	35.4	23					
81																				
82																				
83		<input type="text" value="Connecticut"/>				\$43,173	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td>state</td> <td>per cap</td> </tr> <tr> <td>Rhode Island</td> <td>\$31,916</td> </tr> </table>		state	per cap	Rhode Island	\$31,916								
state	per cap																			
Rhode Island	\$31,916																			
84																				
85																				
86																				

You will need to

- calculate new values and ranks in columns I to O
- do a search and extraction based upon one row's criteria
- do a search and extraction based upon two rows' criteria
- add a combo control box
- add a vertical table lookup
- do various formatting such as alignment, decimal display, cell borders, and cell shading
- answer some questions at the end of this document

Start by **naming** two cell ranges using: Insert | Name | Define

- the cells from A3 to O54 are to be named **states**
- the cells from A4 to O54 are to be named **data**

Steps to fill in the columns

- I** The population change is given by
$$= \frac{\text{Pop}\{2000\} - \text{Pop}\{1940\}}{\text{Pop}\{1940\}}$$
. Format using % and 1 decimal pt.
- J** Rank of column I is found using = Rank(cell in column I, range cells in column I)
Note: the range is \$I\$4:\$I\$54 which does not include the Total USA row
- K** The population is found by taking the values in column C divided by those in column D
Format the results to 1 decimal place.
- L** Rank Column K as was done in Column K, except have the order ascending by adding a “,1” inside the Rank function. That is, use =Rank(number, reference, 1).
- M** Rank column F in descending order (no “,1”)
- N** Calculate using = 0.51 * female median age (Column G) + 0.49 * male median age (Column H)
- O** Finally, show the ranks of column N where the youngest state (Utah) gets the “1.”

Search and Extract

- [1] Copy and paste row #3 to row #58 and also row #62 (use icons or Ctrl-C, Ctrl-V)

Extract all states that have a 2000 population below 10,000,000, are larger than 10,000 sq. miles, are less than 75% Urban, have a per capita income above \$30,000 and a median age below 36.



Use Data | Filter | Advanced Filter with the action copy to another place, List Range of \$A\$3:\$O\$54, Criteria Range in rows #58 and #59, and Copy to at most rows #62 to #69.

- [2] Repeat the criteria above as rows #70 and #71 and add in row #72 (OR CASE) that will add any new states that have less than 60% Urban and above \$34,000 per capita incomes.

The criteria are shown in rows #70 to #72 and the extracted results go to rows #74 up to #81.

Combo Control Box

- Select View | Toolbars | Control Box.
- Select the icon in the top left (Design Mode – Figure #1)
- Select the icon on the right (Combo Box – Figure #2)
- Use the mouse to left click on C83 and stretch the + to a rectangle to D83.
- Right click on the Combo Box you just created and choose Properties.
- Settings:

Bound Column	6
Column Count	15
List Fill Range	data
Linked Cell	F83
- Close this box , select Design Mode, and close  the toolbar.

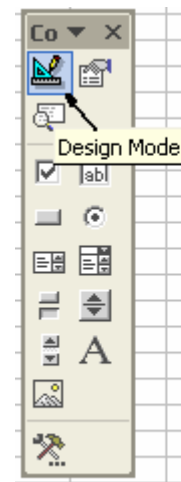


Figure #1

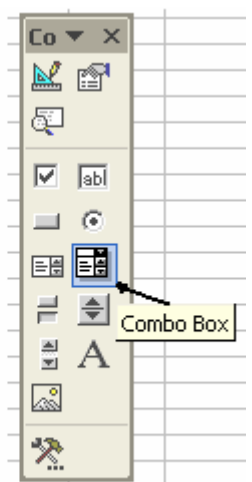



Figure #2

Vertical Table Lookup

- The function setup is given by **=vlookup(lookup_value, table_array, column_index_number)**
- Use any state as your **lookup_value** for J84
- Use the named cells **data** for the **table_array**
- Use **6** as the **column_index_number**. This means the output will come from the 6th column in the **table_array** named **data**

Formatting

- Extend the underline thick border for cells A3 to O3.
- Column N is to be shown with one decimal place.
- Highlight cells A82 to O86 and either use Format | Cells... and select the Patterns tab **or** use the icon fill color  with the choice pale blue.

Questions to Answer (in all answers include Washington, DC even though it is not a state)

- [1] Which two states had the largest percentage population increase?
- [2] Which two states had the largest percentage decrease or smallest increase?
- [3] What is the population per square mile for New Jersey and North Dakota?
- [4] Which two states had the lowest population per square mile?
- [5] Which two states had the highest per capita income and what was that per capita income?
- [6] Repeat [5] for the lowest two states.
- [7] Which two states had the highest median age and what is that age?
- [8] Repeat [8] for the lowest two states.
- [9] What was the population percentage change and per capita income for **your home state**?
- [10] When you type **your name** in cell J84, what per capita income does it show in K84?