

AZ-SMART Population Synthesis Example

Step #1a: Given Census information for a block group:

Total Households:		100
Households by Size:	1	30
	2	40
	3+	30
Households by Income:	Low	60
	High	40

Step #1b: Compute (yellow cells) a household frequency matrix that matches the block group level information using IPF/IPU methodologies:

Households		Household Income		Total
		Low	High	
Household Size	1	23.6	6.4	30
	2	15.2	24.8	40
	3+	21.3	8.7	30
Total		60	40	100

Step #2: Using the counts from the household frequency matrix (yellow cells above), sample the appropriate number of detailed PUMS records from each cell:

household_id	block_group_id	persons	workers	age_of_head	income	building_type	number_rooms	home_sqft	home_value_per_sqft
1	1	3	2	30	97518	SFR	6	1752	130
2	1	4	2	46	67581	SFR	8	2108	112
3	1	2	2	57	86271	MFR	4	1012	105
4	1	2	1	22	48281	SFR	5	2248	95
5	1	3	2	26	55813	SFR	7	1958	115
6	1	1	0	67	24924	MFR	4	875	104

Detailed household records sampled from PUMS to match block group distributions

Step #3: Now that we have very detailed records about the block group's occupants, match the information in these records with similar information from the Maricopa County Assessor's database of land parcels and built space via an "attribute distance/scoring" function.

parcel_id	building_id	building_type	number_rooms	building_sqft	assessed_value	units_in_building	year_built
1	1	SFR	8	2125	189560	1	1985
2	2	SFR	5	2672	212784	1	1998
3	3	SFR	8	3258	245890	1	2002
4	4	MFR	4	958	95824	12	1996
5	5	MFR	5	1247	104530	8	2005
6	6	SFR	9	2847	159254	1	2007

Assessor "built space" table (MAG NRIT)

The result is a very detailed, statistically "valid," yet synthetic database representation of land linked to built space that is in turn linked to the occupants, including households and persons:

