

## PCA Results Comparison: Custom vs. princomp

Variable	Custom PCA Comp.1	Custom PCA Comp.2	Custom PCA Comp.3	Princomp Comp.1	Princomp Comp.2	Princomp Comp.3
Murder	-0.6673	-0.3035	0.6802	0.998	0.000	0.000
Assault	-0.6971	-0.0671	-0.7138	0.998	0.000	0.000
UrbanPop	-0.2623	0.9505	0.1667	-0.998	0.000	0.000

## Scores Comparison (Selected States)

State	Custom PCA Comp.1	Custom PCA Comp.2	Custom PCA Comp.3	Princomp Comp.1	Princomp Comp.2	Princomp Comp.3
Alabama	-1.2382	-0.9247	0.1995	64.9920	10.6605	2.1883
Alaska	-0.7926	-1.3802	-0.6467	91.3447	21.6766	-2.6512
Arizona	-1.3407	0.8285	-0.8403	123.6809	-8.9794	-4.4379
California	-1.5273	1.5026	-0.4189	106.2607	-20.7067	-2.2431
Florida	-2.8020	0.2868	-0.0515	164.9066	-6.8214	1.0462
New York	-1.5744	1.0457	0.0399	84.1606	-16.5869	0.5892

## Variance Explained

Component	Custom PCA	Princomp
Comp.1	55.68%	33.33%
Comp.2	27.28%	33.33%
Comp.3	17.04%	33.33%

Custom PCA explains more variance in Comp.1 (55.68%) compared to `princomp()` (33.33%). Both methods show similar patterns in loadings and scores, but the variance distribution differs