

Cattell Scree Plot Analysis

Standalone verified Python analysis

Test: Cattell Scree Plot Analysis

Design: Ordered correlation eigenvalues with first and second differences for elbow identification.

Variables: G1, G2, G3, famrel, freetime, goout

Null hypothesis: The eigenvalue sequence has no interpretable elbow above the scree.

Formula: Plot λ_j versus j ; inspect $\Delta \lambda_j$ and $\Delta^2 \lambda_j$ for the break in slope.

Source rows: 649

Calculated metrics:

largest_eigenvalue: 2.7828698961540006

elbow_component: 2

eigenvalues_above_one: 2

first_two_variance: 0.694612262636963

components: 6

Independent reference values:

largest_eigenvalue: 2.7828698961540006

elbow_component: 2

eigenvalues_above_one: 2

first_two_variance: 0.694612262636963

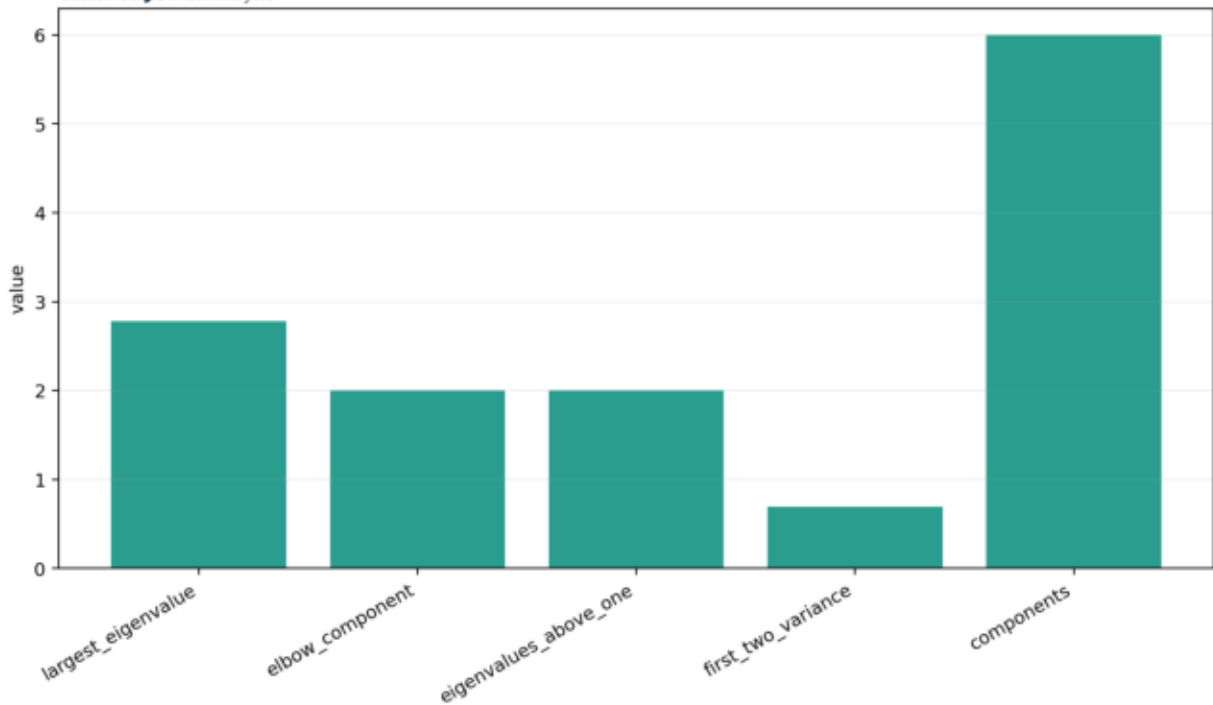
components: 6

Interpretation:

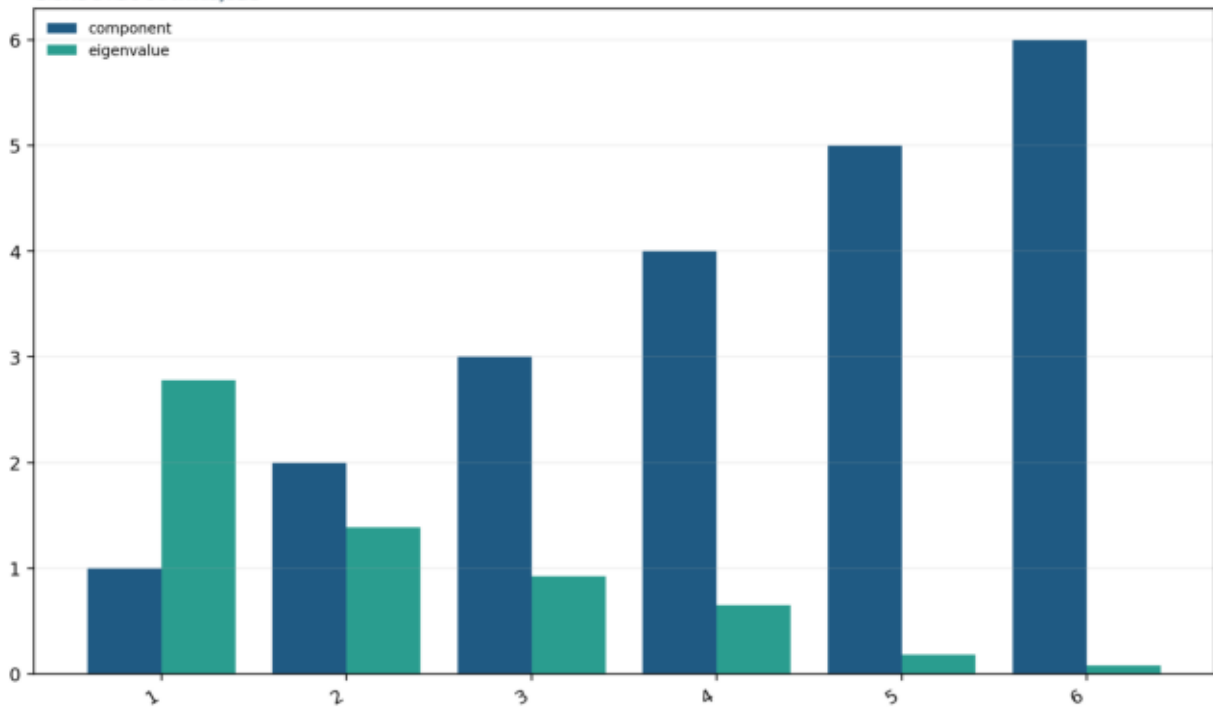
The scree elbow is identified from curvature, separately from Kaiser or parallel rules.

Detected elbow component=2.

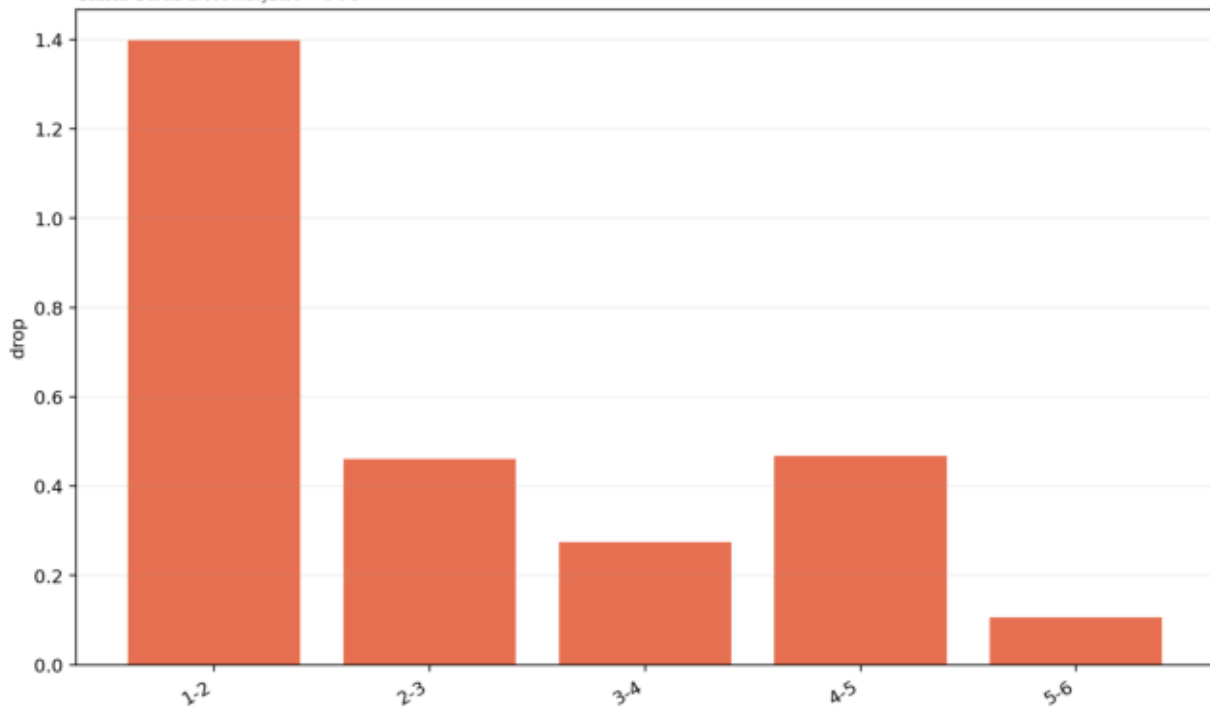
Primary Metrics



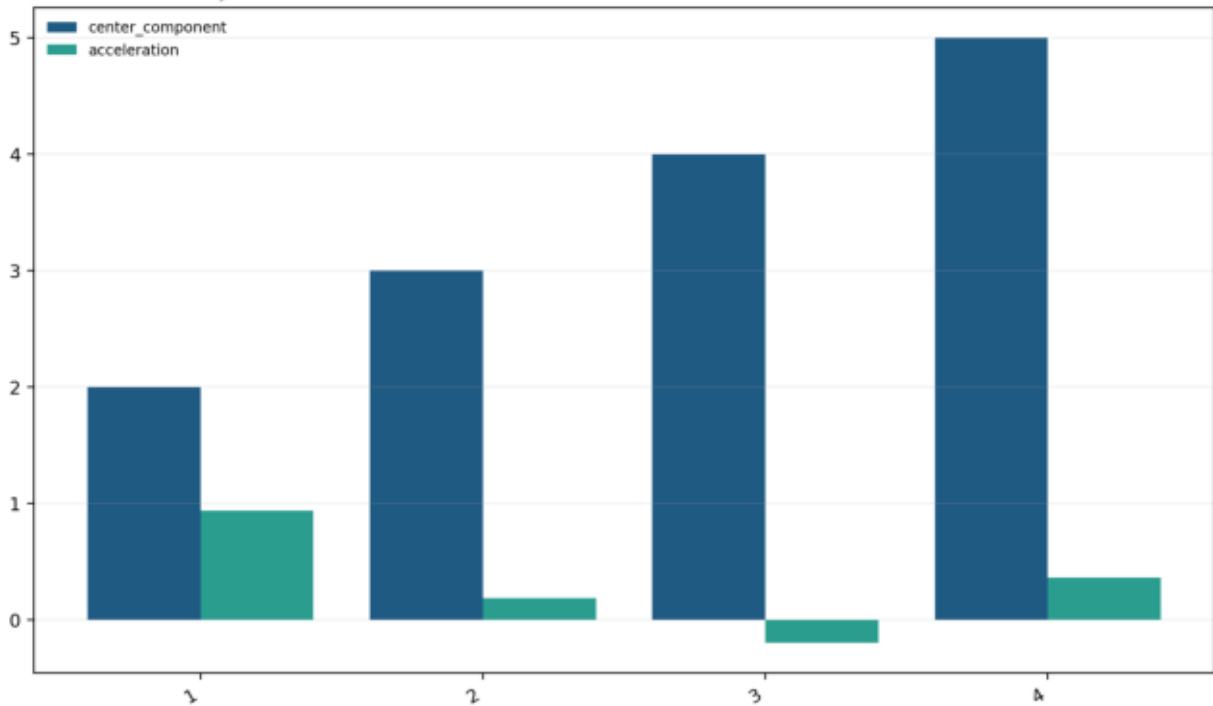
Scree Coordinates



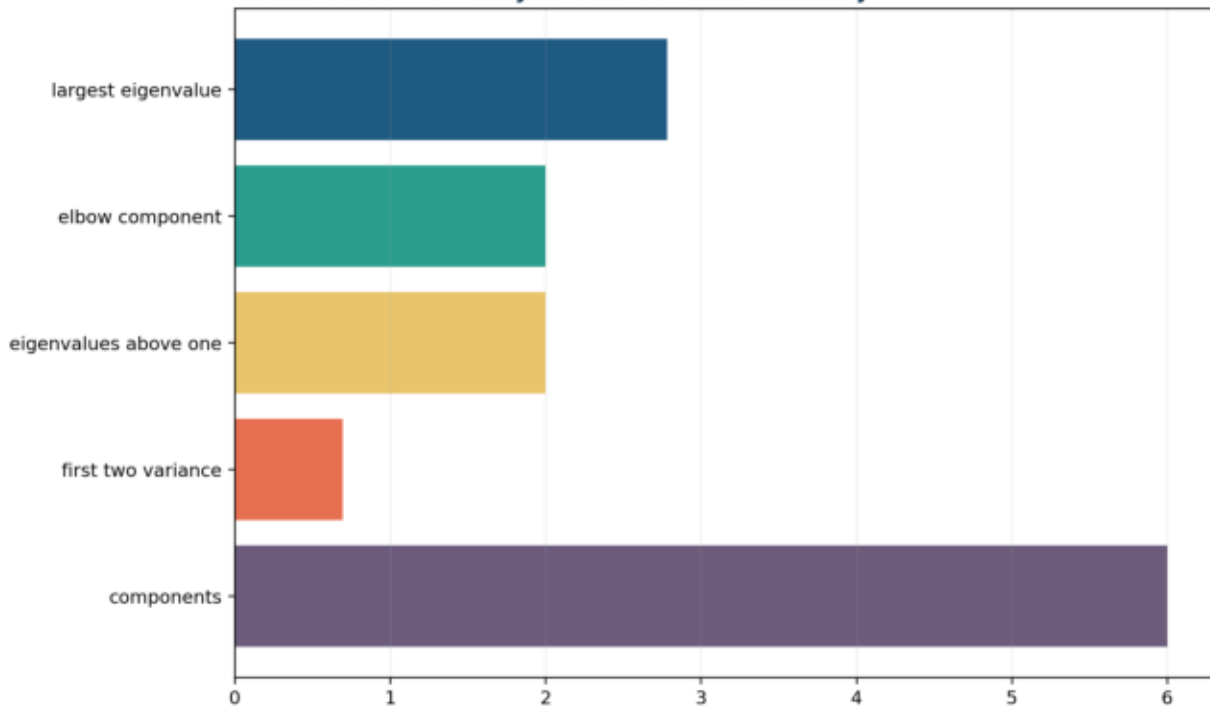
Scree First Differences



Screen Second Differences



Cattell Scree Plot Analysis verified result summary



Primary Metrics

metric	value
largest_eigenvalue	2.78287
elbow_component	2
eigenvalues_above_one	2
first_two_variance	0.694612
components	6

Scree Coordinates

component	eigenvalue
1	2.78287
2	1.3848
3	0.924099
4	0.650103
5	0.182299
6	0.0758252

Scree First Differences

between_components	drop
1-2	1.39807
2-3	0.460705
3-4	0.273995
4-5	0.467804
5-6	0.106474

Scree Second Differences

center_component	acceleration
2	0.937361
3	0.18671
4	-0.193809
5	0.36133