**Principal Components: on Correlations**

**Summary Plots**



Select componentComponent 1Component 2

**Eigenvalues**

| **Number** | **Eigenvalue** | **Percent** |  | **Cum Percent** |
| --- | --- | --- | --- | --- |
| 1 | 3.0743 | 27.948 |  | 27.948 |
| 2 | 2.6618 | 24.198 |  | 52.147 |
| 3 | 1.6774 | 15.249 |  | 67.396 |
| 4 | 1.0177 | 9.252 |  | 76.648 |
| 5 | 0.7156 | 6.506 |  | 83.153 |
| 6 | 0.6621 | 6.019 |  | 89.172 |
| 7 | 0.5724 | 5.204 |  | 94.376 |
| 8 | 0.3648 | 3.316 |  | 97.692 |
| 9 | 0.1374 | 1.249 |  | 98.941 |
| 10 | 0.0664 | 0.603 |  | 99.544 |
| 11 | 0.0501 | 0.456 |  | 100.000 |

Using the Kaiser rule, we choose components with Eigenvectors of up to 1. Thus, we just use 4

Using the \_\_\_\_\_\_ jon leaf? Rule, we choose eigenvectors up to 0.7. Thus, we use 5

Using the 80% rule, we use all components that explain up to 80% of the data. Thus, we use 5 components

**Eigenvectors**

|  | **Prin1** | **Prin2** | **Prin3** | **Prin4** | **Prin5** | **Prin6** | **Prin7** | **Prin8** | **Prin9** | **Prin10** | **Prin11** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| calories | -0.03939 | 0.56027 | -0.11018 | 0.26385 | -0.18411 | 0.11822 | -0.04509 | -0.03149 | 0.17777 | 0.43117 | -0.57826 |
| protein | 0.36420 | -0.01621 | 0.27461 | 0.52772 | 0.13848 | 0.15169 | 0.09589 | -0.61955 | 0.19800 | -0.03889 | 0.19300 |
| fat | 0.18626 | 0.26143 | -0.35818 | 0.53130 | 0.27571 | -0.33380 | -0.09700 | 0.43815 | -0.06240 | -0.09029 | 0.29244 |
| sodium | -0.09510 | 0.31638 | 0.35552 | -0.16150 | 0.05542 | -0.75770 | 0.35763 | -0.17820 | -0.02123 | -0.00867 | -0.03214 |
| fiber | 0.50067 | -0.09873 | 0.20964 | -0.20050 | 0.00980 | 0.03145 | 0.18222 | 0.30879 | 0.06282 | 0.68179 | 0.23877 |
| carbo | -0.31221 | 0.13253 | 0.49517 | 0.18312 | -0.40508 | 0.07923 | -0.15998 | 0.33617 | 0.42290 | -0.11038 | 0.32593 |
| sugars | 0.02040 | 0.39265 | -0.44811 | -0.40092 | 0.01992 | 0.14330 | 0.18988 | -0.18916 | 0.48630 | -0.08913 | 0.38298 |
| potass | 0.52240 | 0.03732 | 0.15346 | -0.10803 | 0.01780 | 0.08761 | 0.21188 | 0.32249 | 0.25175 | -0.53881 | -0.42416 |
| vitamins | -0.05557 | 0.30307 | 0.34553 | -0.24219 | 0.68772 | 0.16847 | -0.47390 | 0.02461 | 0.00876 | 0.01037 | -0.01740 |
| weight | 0.20769 | 0.49157 | 0.13259 | -0.08536 | -0.32115 | 0.27103 | 0.03472 | -0.03333 | -0.65686 | -0.16833 | 0.22724 |
| cups | -0.39292 | 0.03202 | 0.08542 | 0.17734 | 0.35615 | 0.37438 | 0.69709 | 0.20391 | -0.10320 | 0.02505 | 0.00707 |

**Loading Matrix (correlations b/w Features and Principal Component)**

|  | **Prin1** | **Prin2** | **Prin3** | **Prin4** | **Prin5** | **Prin6** | **Prin7** | **Prin8** | **Prin9** | **Prin10** | **Prin11** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| calories | -0.06907 | 0.91408 | -0.14269 | 0.26618 | -0.15575 | 0.09620 | -0.03411 | -0.01902 | 0.06588 | 0.11109 | -0.12946 |
| protein | 0.63858 | -0.02645 | 0.35566 | 0.53237 | 0.11715 | 0.12343 | 0.07255 | -0.37421 | 0.07338 | -0.01002 | 0.04321 |
| fat | 0.32658 | 0.42652 | -0.46389 | 0.53598 | 0.23323 | -0.27161 | -0.07339 | 0.26464 | -0.02313 | -0.02326 | 0.06547 |
| sodium | -0.16675 | 0.51618 | 0.46044 | -0.16292 | 0.04688 | -0.61652 | 0.27057 | -0.10763 | -0.00787 | -0.00223 | -0.00719 |
| fiber | 0.87787 | -0.16109 | 0.27152 | -0.20227 | 0.00829 | 0.02559 | 0.13786 | 0.18651 | 0.02328 | 0.17565 | 0.05345 |
| carbo | -0.54742 | 0.21623 | 0.64132 | 0.18473 | -0.34268 | 0.06446 | -0.12103 | 0.20304 | 0.15673 | -0.02844 | 0.07297 |
| sugars | 0.03576 | 0.64060 | -0.58037 | -0.40446 | 0.01685 | 0.11660 | 0.14366 | -0.11425 | 0.18023 | -0.02296 | 0.08574 |
| potass | 0.91595 | 0.06090 | 0.19876 | -0.10898 | 0.01506 | 0.07129 | 0.16030 | 0.19478 | 0.09330 | -0.13882 | -0.09496 |
| vitamins | -0.09743 | 0.49446 | 0.44751 | -0.24432 | 0.58178 | 0.13708 | -0.35854 | 0.01486 | 0.00325 | 0.00267 | -0.00390 |
| weight | 0.36416 | 0.80200 | 0.17173 | -0.08612 | -0.27168 | 0.22053 | 0.02627 | -0.02013 | -0.24344 | -0.04337 | 0.05087 |
| cups | -0.68894 | 0.05223 | 0.11063 | 0.17890 | 0.30128 | 0.30463 | 0.52740 | 0.12316 | -0.03825 | 0.00645 | 0.00158 |

Prin1 [Healthy Foods] : high potassium, high fiber, high protein – all in small cups! (no consideration for sugar)

Prin2 [Granola] : High Cal and Sugars and heavy weight! (Nuts/Fruits)

Prin3 [Plain Grain] : Heavy, High Carb, but little sugar

Prin4 [] : Lost interpretability

