



# Cabinet Office

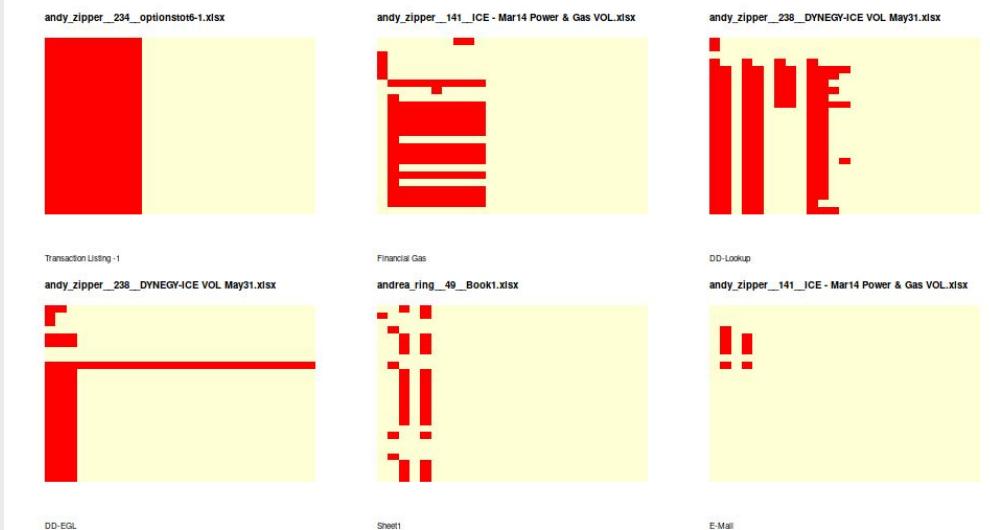
**Duncan Garmonsway**  
Data Scientist  
Government Digital Service  
@nacnudus

# Spreadsheet feature space

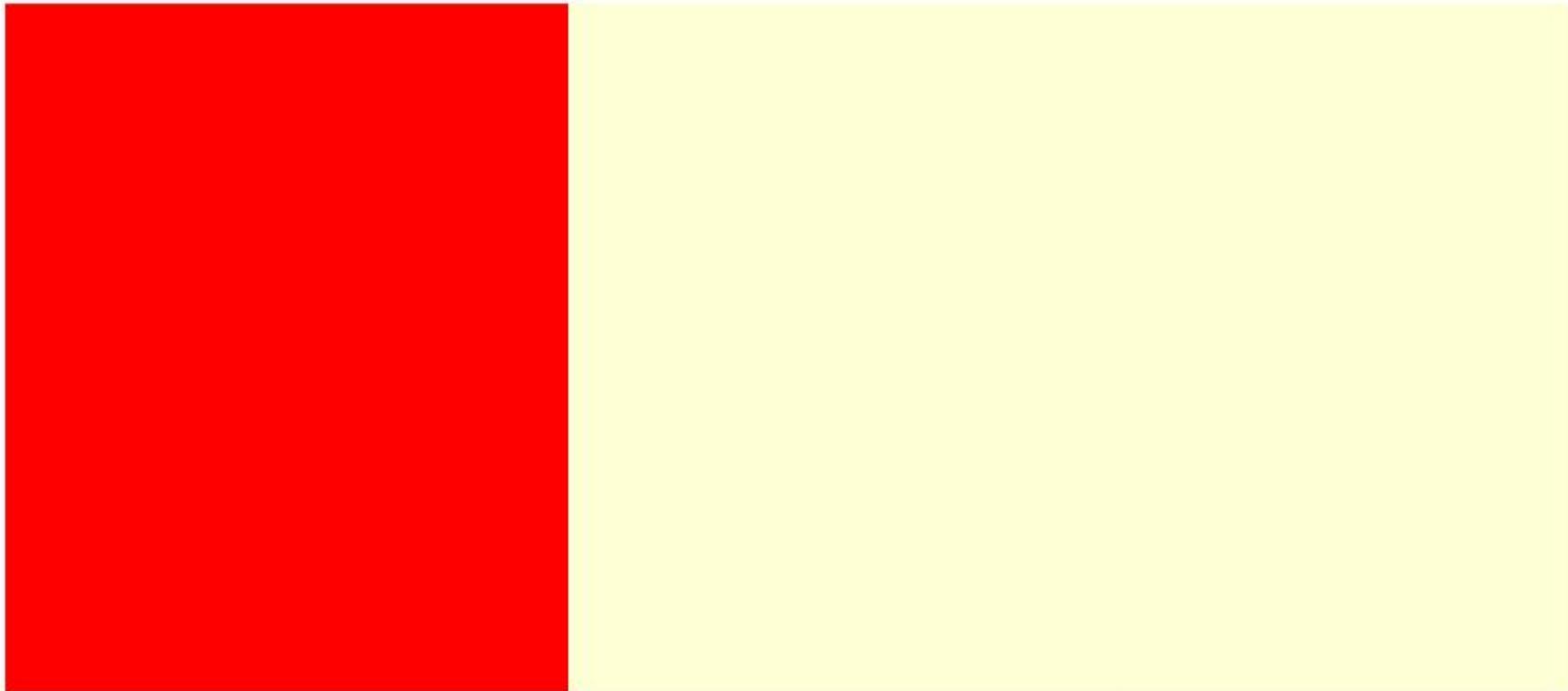
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Page Layout		Custom Views	Full Screen	Gridlines	Headings	Zoom	Synchronous Scrolling	
Layout		Preview	Workbook Views	Show	Zoom to Selection	New Window	Arrange Panes	Split
A1	f1							
1		C	D	E	F	G	H	I
2	Asset Class	Book	Commercial Group	Telephone Asset	Ticker	Sector	Equity Type	Instrument
3	Enron Raptor I - Canadian - Private	Canada Raptor	Kitagawa	403-374-6722	Invesco Energy Raptor I	Canada	Private	Common Equity
4	Enron Raptor I - Canadian - Private Total							
5	Canada Raptor Total							
6	Enron Raptor I - EBS Public	EBS - Raptor - EPI	Hickey	713-853-3195	Avio EBS Raptor I	US:AVCI Network Equipment	Public	Common Equity
7	Enron Raptor I - Total							
8	EBS - Raptor - EPI Total							
9	Enron Raptor I - Equity Partnerships	Equity Partnerships	S. Joseph	713-853-3195	Amherst Raptor I	Equity Partnerships	Partnership	Partnership
10	Enron Raptor I - Equity Partnerships	Equity Partnerships	J. Thompson	713-853-3195	Juniper Raptor I	Equity Partnerships	Partnership	Partnership
11	Enron Raptor I - Equity Partnerships	Equity Partnerships	C. G. Johnson	713-853-3195	Capri Source Raptor I	Equity Partnerships	Partnership	Partnership
12	Enron Raptor I - Equity Partnerships	Equity Partnerships	J. Thompson	713-853-3195	Juniper Exposure Raptor I	Equity Partnerships	Partnership	Partnership
13	Enron Raptor I - Equity Partnerships	Equity Partnerships	C. G. Johnson	713-853-3195	Juniper Raptor I	Equity Partnerships	Partnership	Partnership
14	Enron Raptor I - Equity Partnerships	Equity Partnerships	S. Joseph	713-853-3195	Master Raptor I	Equity Partnerships	Partnership	Partnership
15	Enron Raptor I - Equity Partnerships	Equity Partnerships	S. Joseph	713-853-3195	Master Exposure Raptor I	Equity Partnerships	Partnership	Partnership
16	Enron Raptor I - Equity Partnerships	Equity Partnerships	S. Joseph	713-853-3195	Master Raptor I	Equity Partnerships	Partnership	Partnership
17	Enron Raptor I - Equity Partnerships	Equity Partnerships	S. Joseph	713-853-3195	Master Exposure Raptor I	Equity Partnerships	Partnership	Partnership
18	Energy Capital Resources Raptor Total							
19	Enron Raptor I - EGF SLP - Warrants Public	Equity EGF Raptor	Dunn	713-853-7752	3TEC Warrants EGF Raptor I	US:TENN Energy	Warrants	Warrants
20	Enron Raptor I - EGF SLP - Warrants Public Total							
21	Equity EGF Raptor Total							
22	Enron Raptor I - Priv. Equity Partnerships	Paper Raptor - EPI	Enerson	713-853-1788	Oconto Falls Common Raptor I	Paper	Private	Partnership
23	Enron Raptor I - Priv. Equity Partnerships	Paper Raptor - EPI	Enerson	713-853-1788	Oconto Falls IPC Raptor I	Paper	Private	Partnership
24	Enron Raptor I - Priv. Equity Partnerships Total							
25	Enron Raptor I - Public Equity Raptor	Paper Raptor - EPI	K. Johnson	713-853-3995	Active Power Raptor I	Condor - PHX Investments	Public	Common Equity
26	Enron Raptor I - Public Equity Raptor	Paper Raptor - EPI	K. Johnson	713-853-3995	Active Power Raptor I	Condor - PHX Investments	Public	Common Equity
27	Enron Raptor I - Public Equity Raptor Total							
28	Enron Raptor I - EGF SLP - Prv. Equity Partnerships Total	Producer EGF Raptor	Prod	713-853-3573	Ametek Raptor I	Prv. Equity Partnerships	Partnership	Partnership
29	Enron Raptor I - EGF SLP - Prv. Equity Partnerships Total	Producer EGF Raptor	Neiman	713-853-9400	Devx Energy Common EGF Raptor I	US:DVXE Energy	Public	Common Equity
30	Enron Raptor I - EGF SLP - US Public Total							
31	Enron Raptor I - EGF SLP - US Public	Producer EGF Raptor	Neiman	713-853-9400	Devx Energy Common EGF Raptor I	US:DVXE Energy	Public	Common Equity
32	Enron Raptor I - EGF SLP - US Public Total							
33	Enron Raptor I - EGF SLP - US Structured Credit Total	Producer EGF Raptor	Ludecker	713-853-3504	Hughes Rawls Note EGF Raptor I	Energ	Private	Financing
34	Enron Raptor I - EGF SLP - US Structured Credit Total	Producer EGF Raptor	Baardone	713-853-0850	Hanover Compressor Common EGF Rap US:HC	Condor II - Energ	Public	Common Equity
35	Enron Raptor II - EGF SLP - US Public Total	Producer EGF Raptor	Baardone	713-853-0850	Hanover Compressor Common EGF Rap US:HC	Condor II - Energ	Public	Common Equity
36	Enron Raptor II - EGF SLP - US Public Total							
37	Producer EGF Raptor Total							
38	Enron Raptor I - Special Assets	S. Johnson	713-853-6940	Amherst Raptor I	Condor I - Special Assets	Convertible	Convertible Prefe	
39	Enron Raptor I - Special Assets Total	S. Johnson	713-853-6940	Amherst Raptor I	Condor I - Special Assets	Convertible	Convertible Prefe	
40	Enron Raptor I - Special Assets	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Partnership	
41	Enron Raptor I - Special Assets	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Condor I - Special Assets	Partnership	
42	Enron Raptor I - Priv. Equity Partnerships Total							
43	Enron Raptor I - Special Assets	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
44	Enron Raptor I - Special Assets	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
45	Enron Raptor I - Special Assets	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
46	Enron Raptor I - US Private	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
47	Enron Raptor I - US Private	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
48	Enron Raptor I - US Private Total							
49	Enron Raptor I - US Public	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
50	Enron Raptor I - US Public	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
51	Enron Raptor I - US Public	S. Johnson	713-853-6940	Amherst Raptor I	Special Assets	Private	Common Equity	
52	Enron Raptor I - US Public Total							
53	Enron Raptor I - US Structured Credit Book	Meier	713-345-9361	Ecogas Loan Raptor I	Special Assets	Private	Financing	
54	Enron Raptor I - US Structured Credit Book	Ludecker	713-853-3504	LSI Preferred (AIM) Raptor I	Special Assets	Private	Financing	
55	Enron Raptor I - US Structured Credit Book	CTG	713-853-3504	Not Available Credit Derivative Raptor I	Special Assets	Other	Financing	
56	Enron Raptor I - US Structured Credit Book Total							
57	Enron Raptor I - US Structured Credit Book RA	Ludecker	713-853-3504	Heartland Contingent Construction Loan F	Special Assets	Private	Financing	
58	Enron Raptor I - US Structured Credit Book RA	Ludecker	713-853-3504	Hughes Rawls Loan Raptor I	Special Assets	Private	Financing	
59	Enron Raptor I - US Structured Credit Book RA	Ludecker	713-853-3504	Hughes Rawls Note Raptor I	Special Assets	Private	Financing	
60	Enron Raptor I - US Structured Credit Book RA	Ludecker	713-853-3504	Industrial Holdings Raptor I	Special Assets	Private	Financing	
61	Enron Raptor I - US Structured Credit Book RA Total							
62	Enron Raptor I - Warrants - Private	Meier	713-853-6940	Hornbeck Levee Warrants Raptor I	Condor I - Special Assets	Warrants	Warrants	
63	Enron Raptor I - Warrants - Private	Ludecker	713-853-3504	Heartland Steel Warrants Raptor I	Special Assets	Warrants	Warrants	
64	Enron Raptor I - Warrants - Private	Ludecker	713-853-3504	LSI Warrants (AIM) Raptor I	Special Assets	Warrants	Warrants	
65	Enron Raptor I - Warrants - Private Total							

Can a machine tell  
when a spreadsheet  
is nice?

Look at  
blank/non-blank  
cells

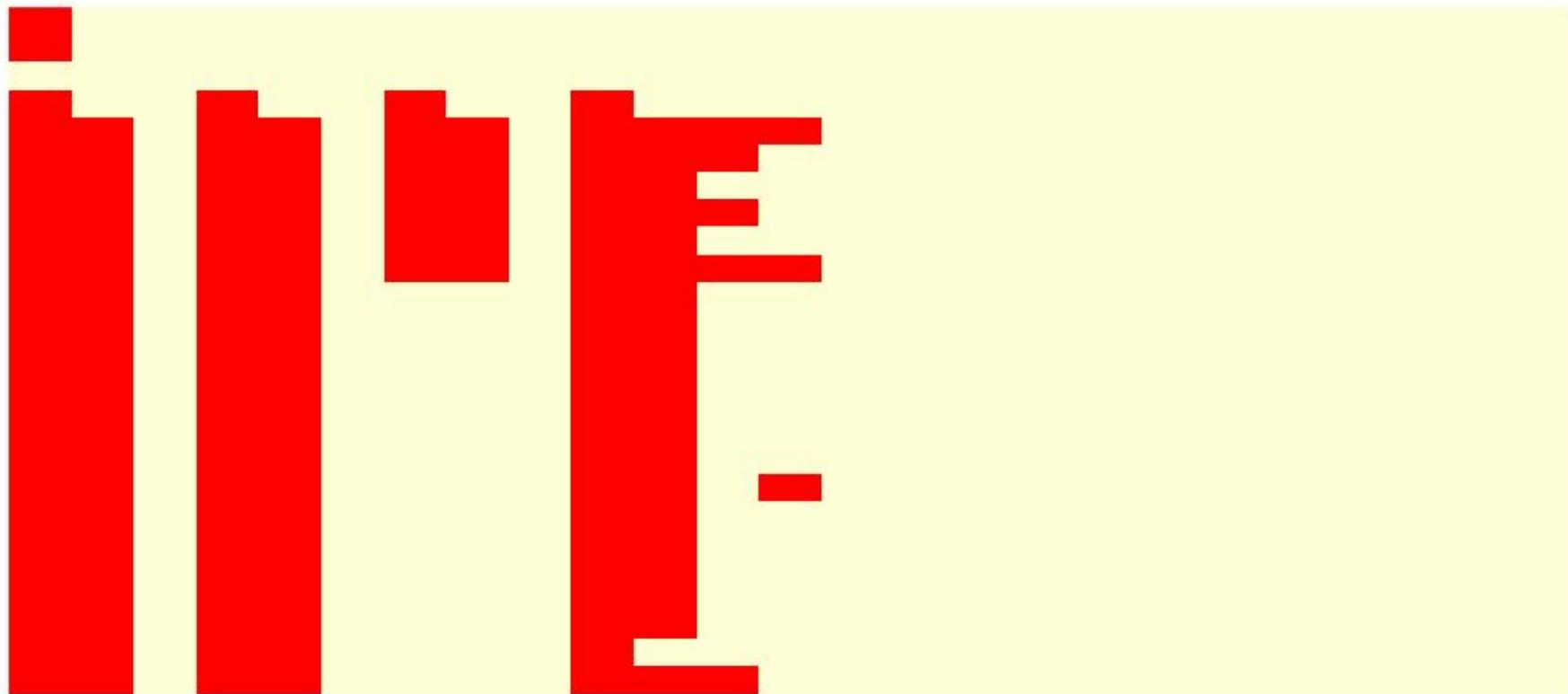


**andy\_zipper\_\_234\_\_optionstot6-1.xlsx**



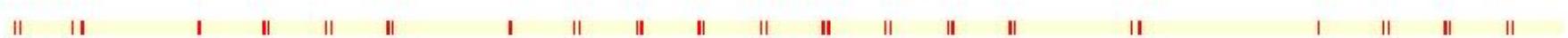


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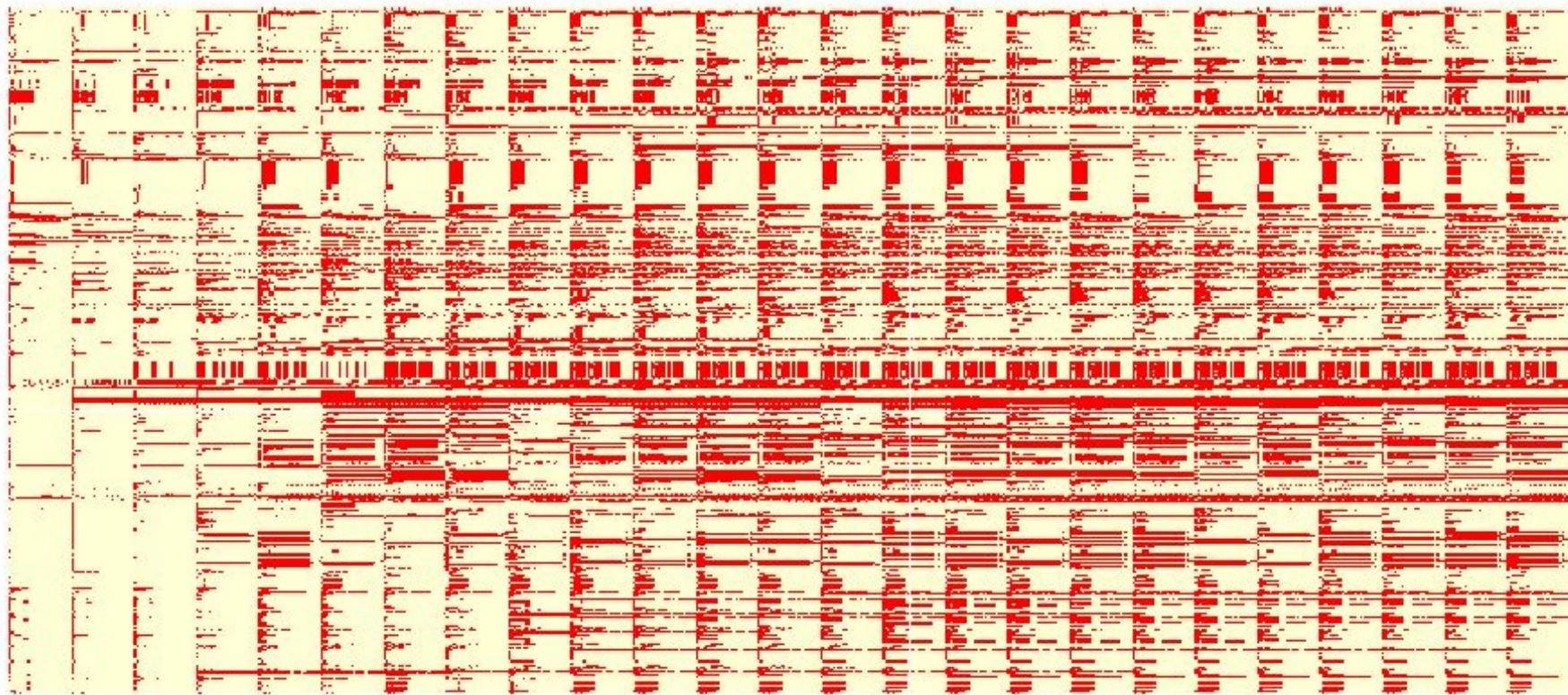




**One row of the feature matrix**

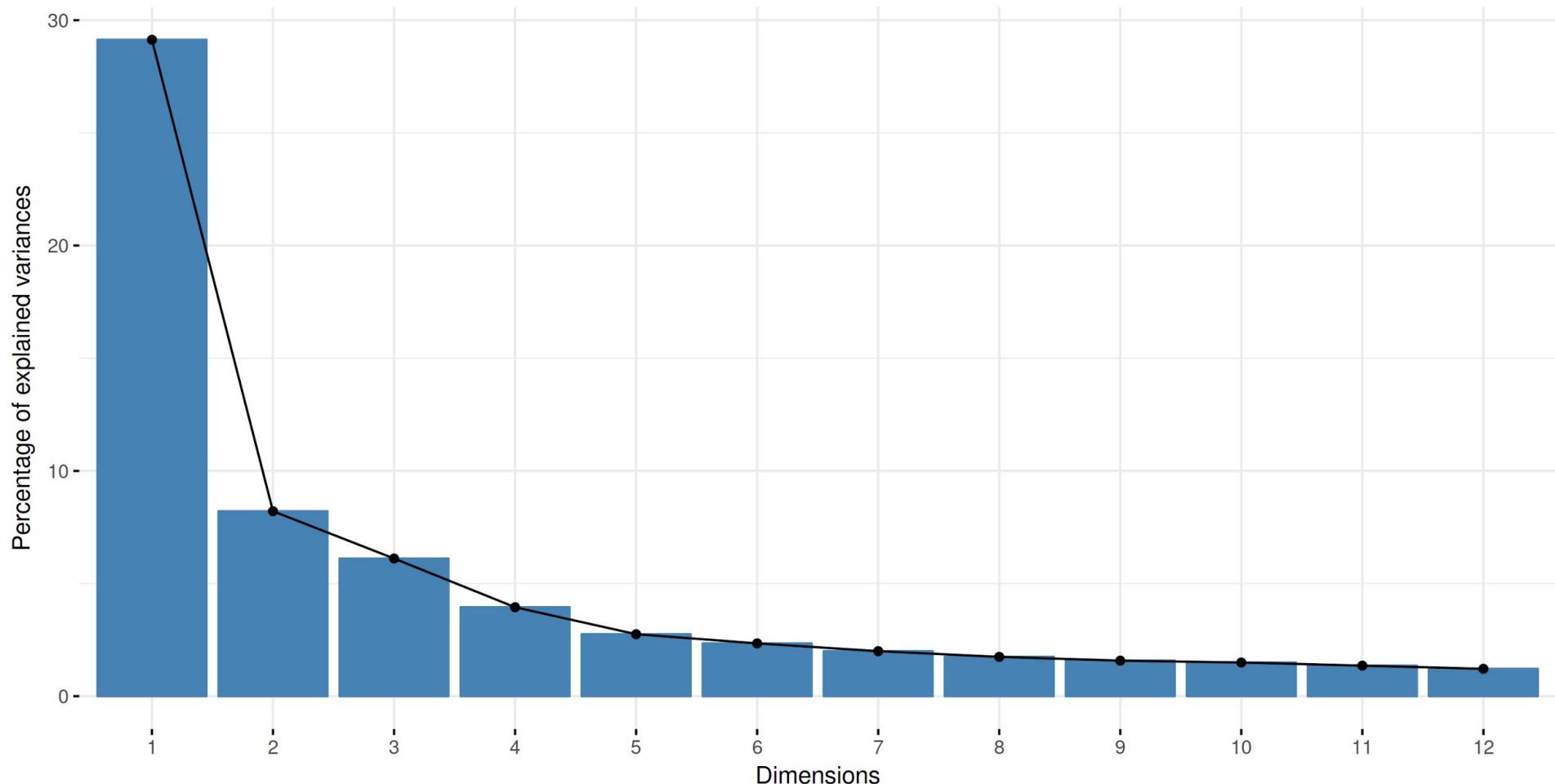


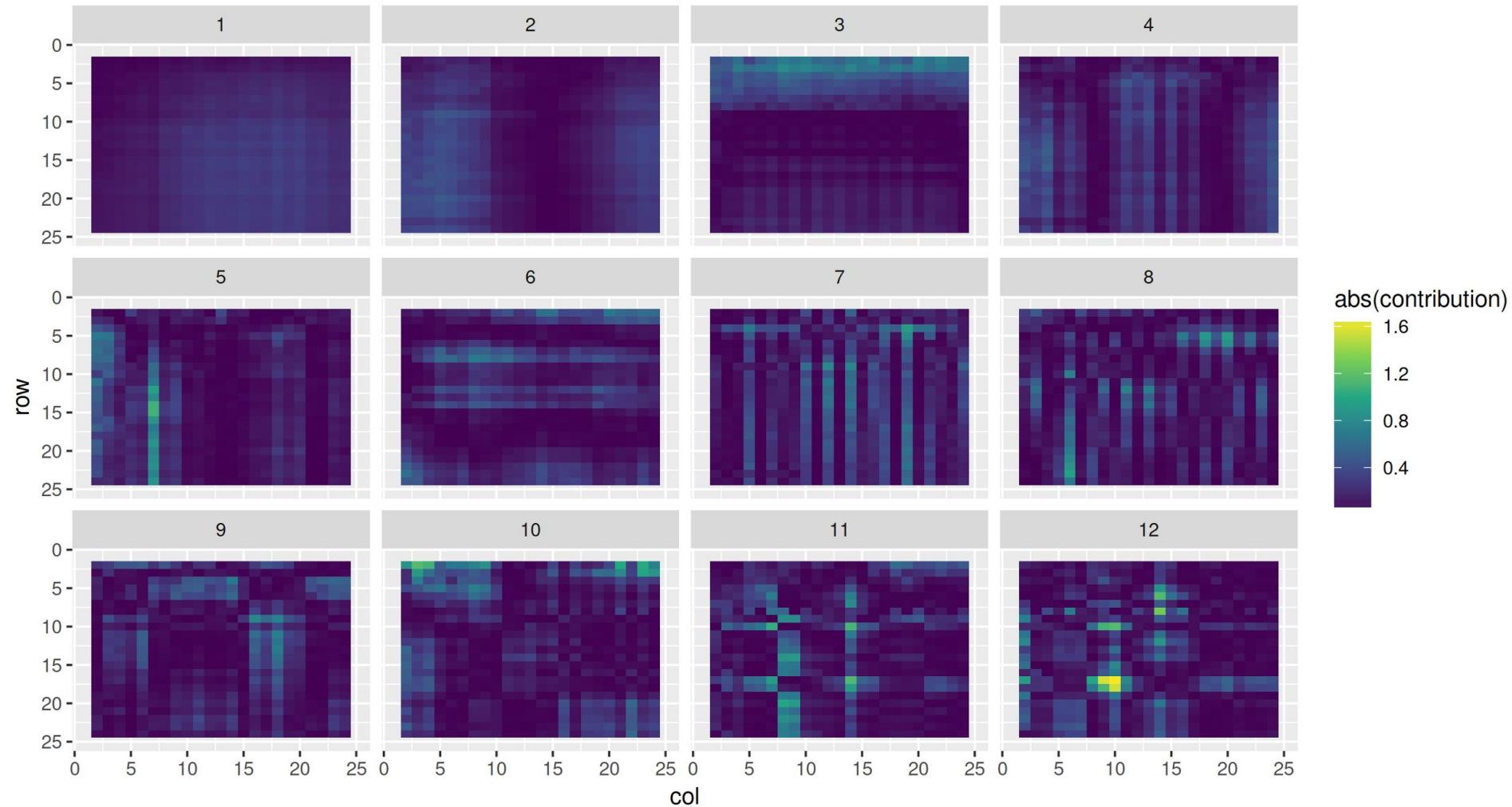
625 rows of the feature matrix



Each row is all the cells in one sheet, laid out in a line

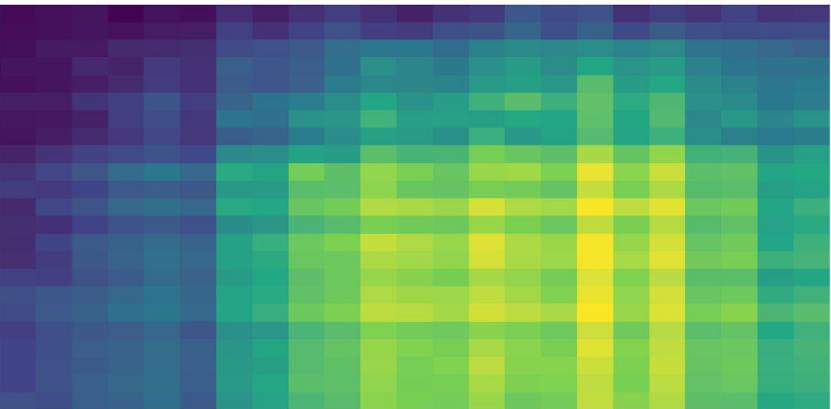
# Scree plot



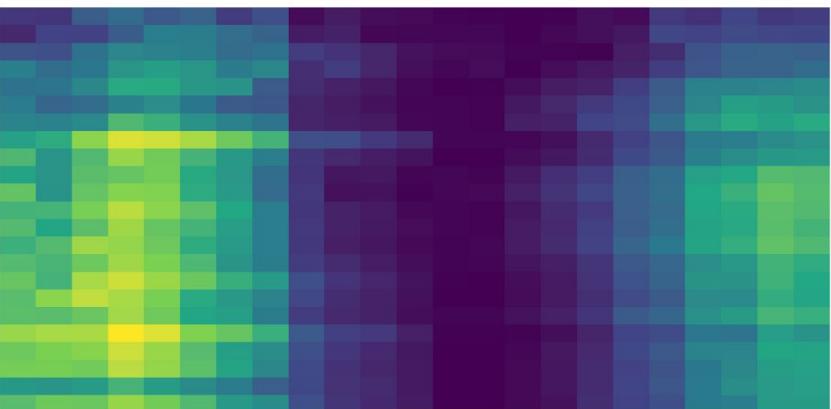


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Page Setup	Font	Font	Font	Font	Font	Font	Font	Font
Clipboard	Font	Font	Font	Font	Font	Font	Font	Font
A1	A	B	C	D	E	F	G	H
1	Net Cash Source / (Use) Current Day and Month to Date							
2	Aug 2001							
3								
4								
5								
6	Total Month to Date	31-Aug	30-Aug	29-Aug	28-Aug	27-Aug	26-Aug	25-Aug
7	Enron Transportation Services	32.5	-	-	-	-	-	-
8	Portland General	32.5	-	-	-	-	-	-
9	Total Distribution	32.5	-	-	-	-	-	-
10	Enron Communications	32.5	-	-	-	-	-	-
11	Enron South America	32.5	-	-	-	-	-	-
12	Total Americas	32.5	-	-	-	-	-	-
13	Europe	109.6	-	-	-	-	-	-
14	Global Markets	89.3	-	-	-	-	-	-
15	Industrial Markets	60.5	-	-	-	-	-	-
16	Networks	22.0	-	-	-	-	-	-
17	Other	2.0	-	-	-	-	-	-
18	Total Traditional Wholesale	107.7	-	-	-	-	-	-
19	Global Assets	93.6	-	-	-	-	-	-
20	EEOP	3.8	-	-	-	-	-	-
21	Corp Wholesale (EE&CC)	60.0	-	-	-	-	-	-
22	Total Wholesale	113.3	-	-	-	-	-	-
23	Enron Energy Services	(42.3)	-	-	-	-	-	-
24	Enron Broadband Services	(752.0)	-	-	-	-	-	-
25	Corp	(15.5)	-	-	-	-	-	-
26	Other	(1.5)	-	-	-	-	-	-
27	Total Enron	(869.5)	-	-	-	-	-	-
28								
29	ONLY includes cash movement monitored from Houston.							
30	Does NOT include Canada, London or any other banking center.							
31	Certain items such as payroll that is paid by Corp on behalf of a business unit has NOT been allocated to the business units							
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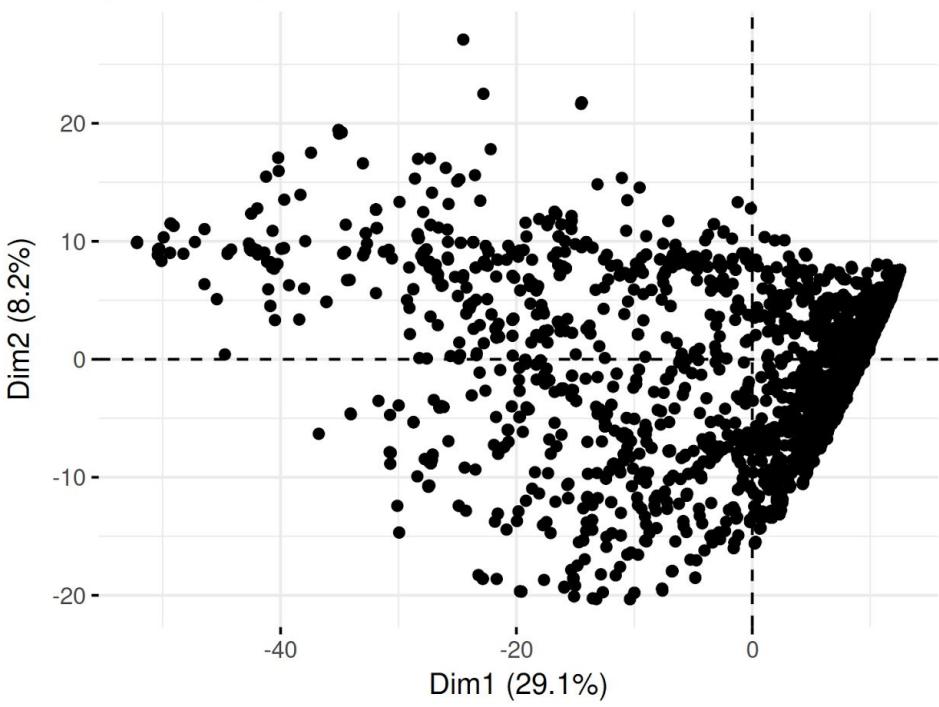
Dimension 1



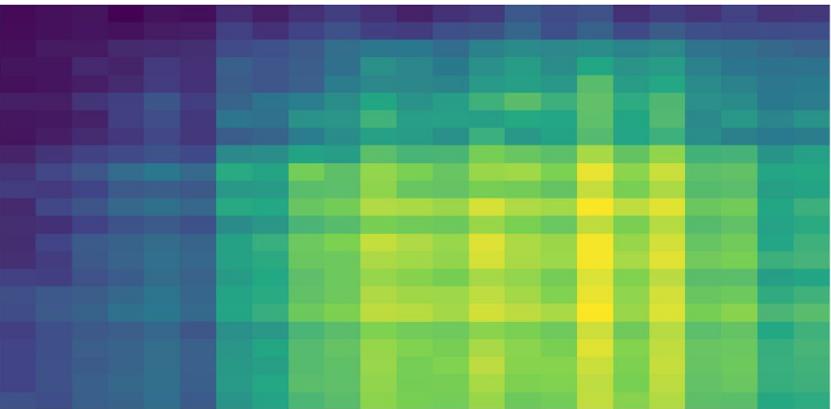
Dimension 2



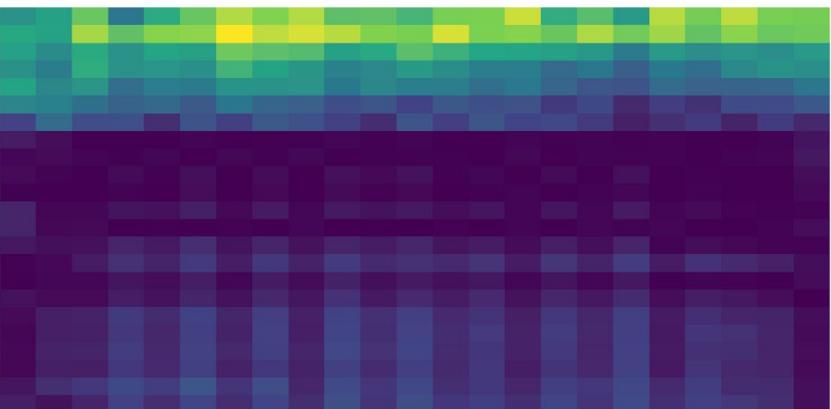
Individuals - PCA



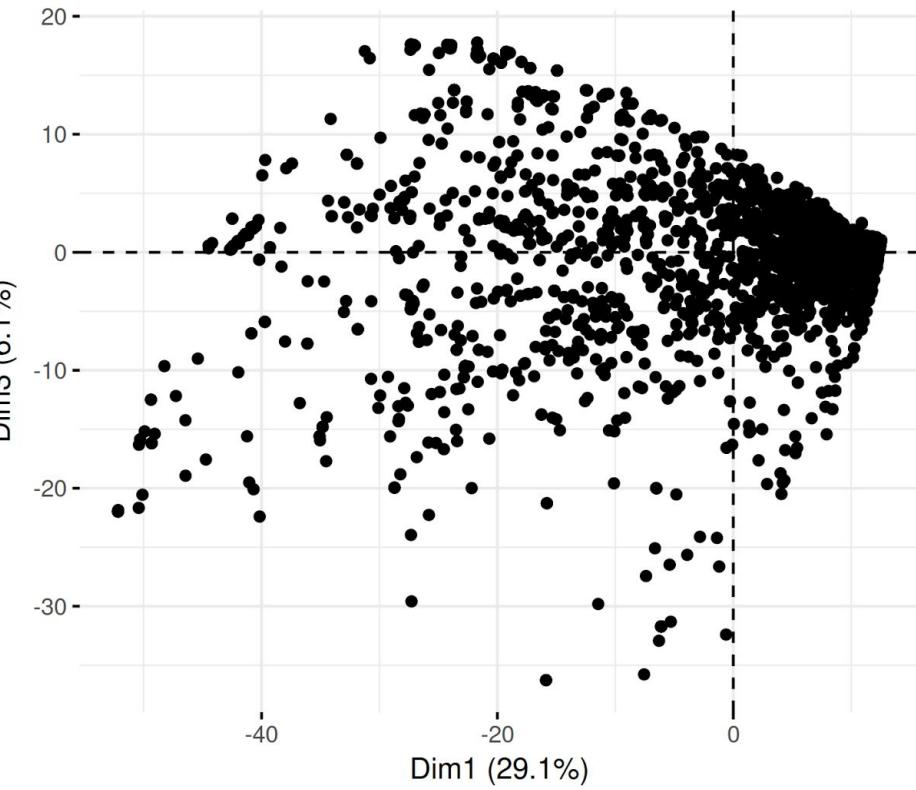
Dimension 1



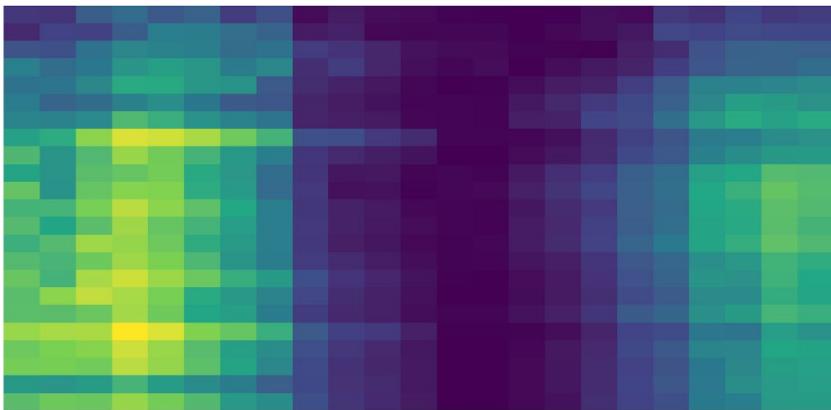
Dimension 3



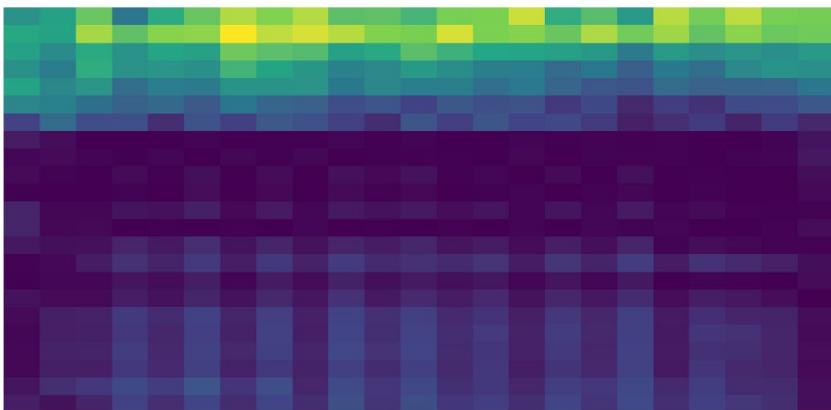
Individuals - PCA



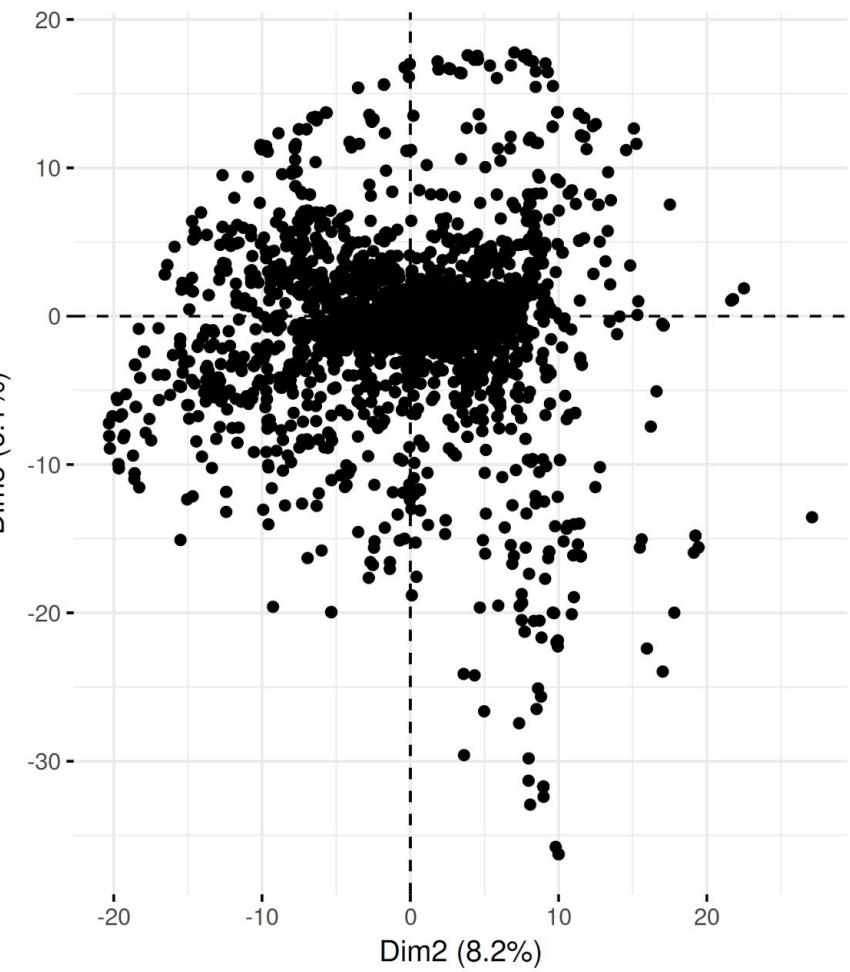
Dimension 2



Dimension 3



Individuals - PCA





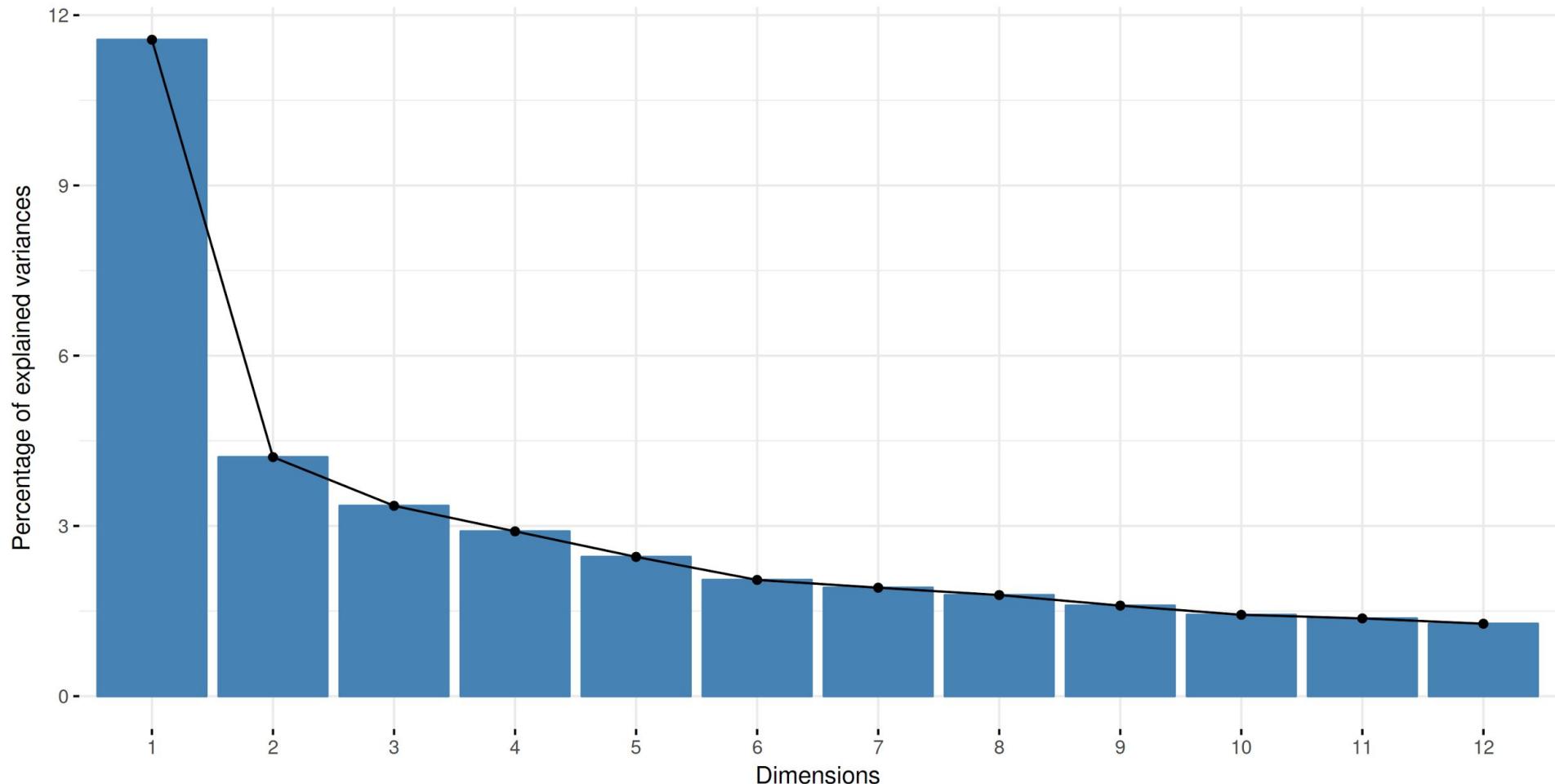
## More features:

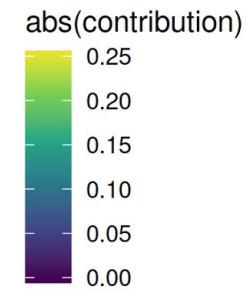
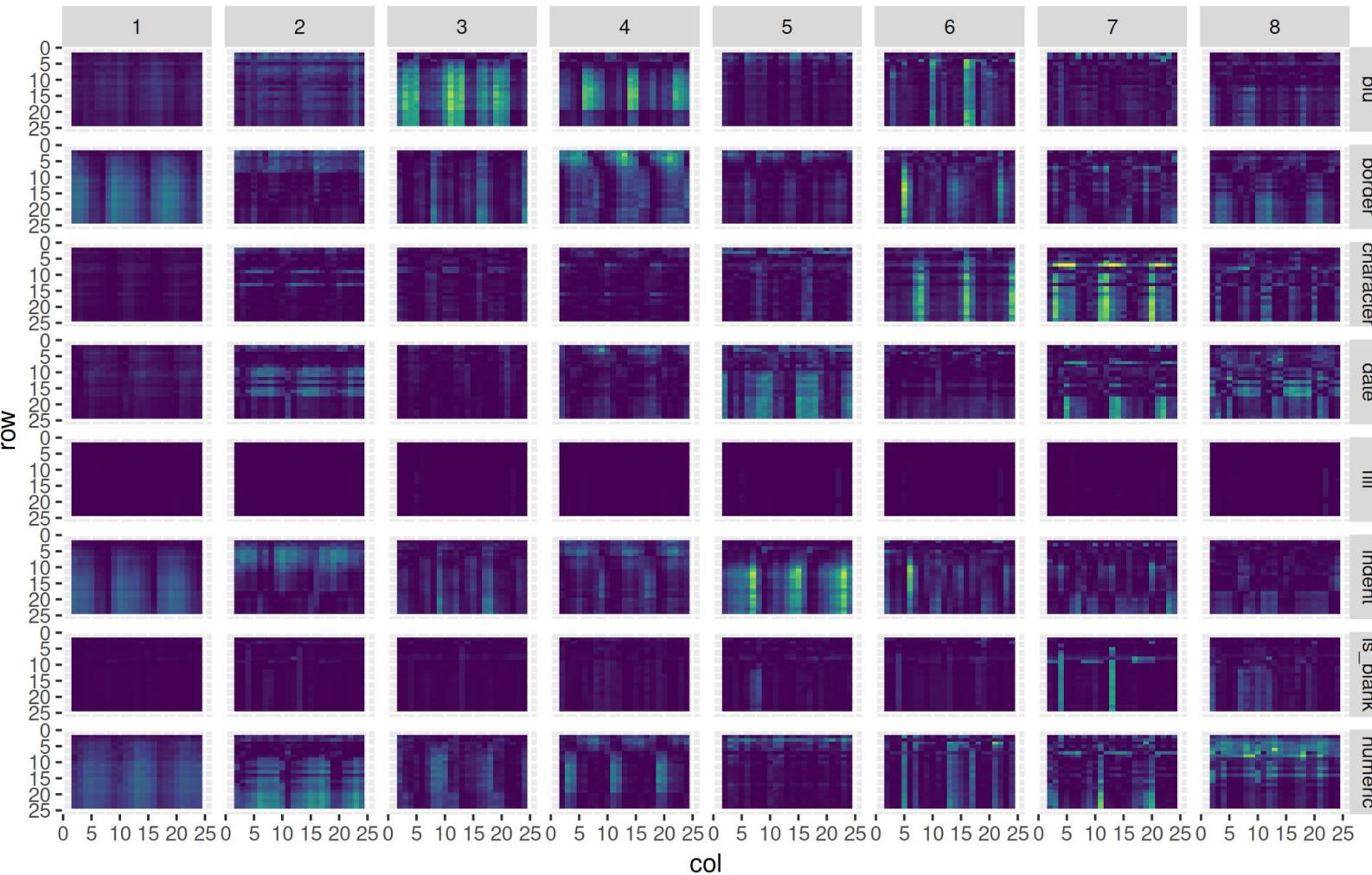
- Datatype (character, numeric, date)
- Bold / underline / italic
- Fill
- Border
- Indent

WHAT IF WE TRIED  
MORE POWER?



# Scree plot







# Engineer better dimensions

# Obtain a relevant corpus