

# ELECTRIC SYSTEM RELIABILITY ANNUAL REPORT

2024

LIBERTY UTILITIES (CALPECO ELECTRIC) LLC (U 933 E)

-- PUBLIC VERSION --

Prepared for California Public Utilities Commission

July 15<sup>th</sup>, 2025

#### **EXECUTIVE SUMMARY**

The Electric System Reliability Annual Report for 2024 has been prepared in response to CPUC Decision 16-01-008, which was approved January 20, 2016. Decision 16-01-008 established reliability recording, calculation, and reporting requirements for Liberty Utilities (CalPeco Electric) LLC.

CalPeco Electric does not provide transmission services. CalPeco Electric does not have an Open Access Transmission Tariff (OATT). Therefore, data is presented for the distribution services only. All statistics and calculations include forced distribution outages. Forced outages are those that are not prearranged. For the purposes of this report, sustained outages are outages that lasted more than five minutes in duration, while momentary outages are outages that lasted five minutes or less in duration.

The reliability indicators that are tracked are as follows:

- 1. SAIDI (System Average Interruption Duration Index) minutes of sustained outages per customer per year.
- 2. SAIFI (System Average Interruption Frequency Index) number of sustained outages per customer per year.
- 3. MAIFI (Momentary Average Interruption Frequency Index) number of momentary outages per customer per year.
- 4. CAIDI (Customer Average Interruption Duration Index) is the average time required to restore service to a utility customer.

CalPeco Electric presents ten years (2015 through 2024) of data, which represents the period in which Liberty Utilities purchased CalPeco Electric from NV Energy.

The measurement of each reliability performance indicator excludes IEEE Major Event Days (MED) instead of CPUC Major Events. An IEEE Major Event Day is defined in IEEE-1366, Section 4.5 as a day in which the daily system SAIDI exceeds a threshold value. These threshold major event days are referred to as "TMED". Thus, any day in which the total system SAIDI exceeds TMED is excluded from CalPeco Electric's reliability results. The applicable TMED value is calculated at the end of each year using CalPeco Electric's daily SAIDI values for the prior five years. CalPeco Electric's TMED value for 2024 was 92.23 minutes of daily system SAIDI. Other reliability indices in this report are not calculated using methodologies or formulas exactly as described in the IEEE guide for electric power Distribution Reliability indices (IEEE-1366).

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#### 1) System Indices for the Last 10 Years (Years CalPeco Electric in business)

- a. Separate tables with SAIDI, SAIFI, MAIFI and CAIDI (Major Event Day (MED)) included and excluded.
  - I. Distribution System Indices (Major Event included and excluded)

Liberty Utilities (CalPeco Electric), LLC

<u>Distribution</u> Historical System Reliability Data 10 Years (Years in Business)

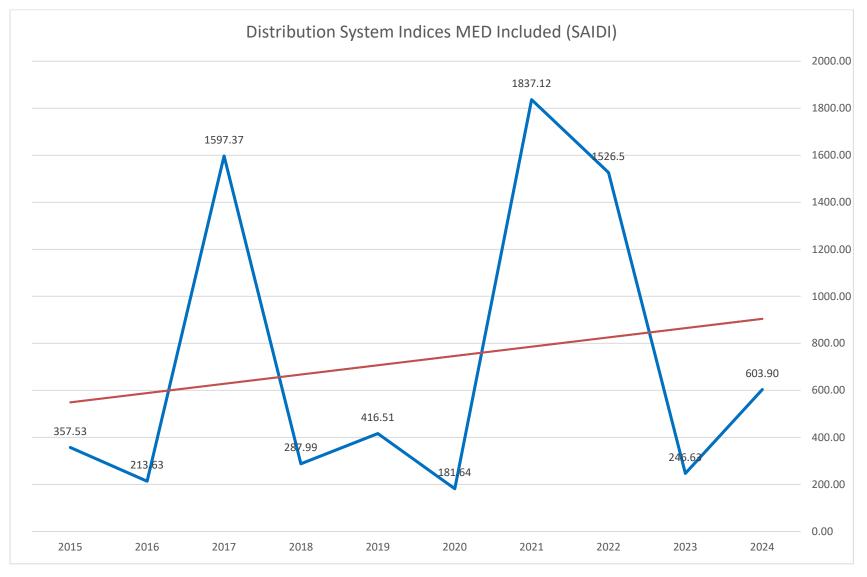
		111	eterical eyeteri	Trondomity De
		Major Even	t Included	
Year	SAIDI	SAIFI	CAIDI	MAIFI
2024	603.90	1.76	343.49	0.05
2023	246.63	1.97	125.19	.292
2022	1526.5	5.107	298.87	0.113
2021	1837.12	5.36	342.74	0.548
2020	181.64	1.57	115.23	0.313
2019	416.51	2.96	140.73	0.31
2018	287.99	2.18	131.82	0.52
2017	1597.37	3.97	402.06	1.37
2016	213.63	1.47	144.98	1.08
2015	357.53	2.01	177.68	1.15

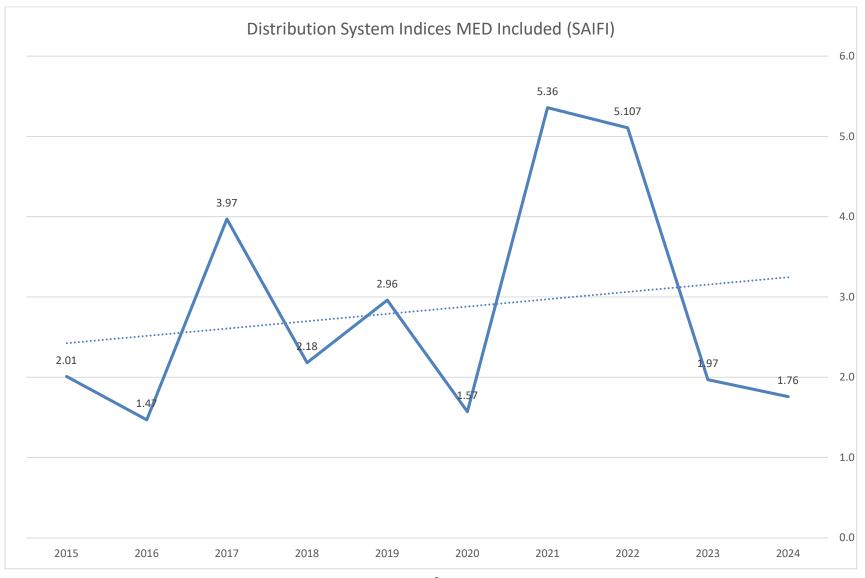
	Major Eve	nt Excluded	
SAIDI	SAIFI	CAIDI	MAIFI
317.57	1.90	167.17	0.06
246.63	1.97	125.19	.292
470.75	3.471	135.65	0.113
916.28	4.60	199.19	0.548
181.64	1.57	115.23	0.313
416.51	2.96	140.73	0.31
287.99	2.18	131.82	0.52
772.83	2.86	270.23	1.37
213.63	1.47	144.98	1.08
357.53	2.01	177.68	1.15

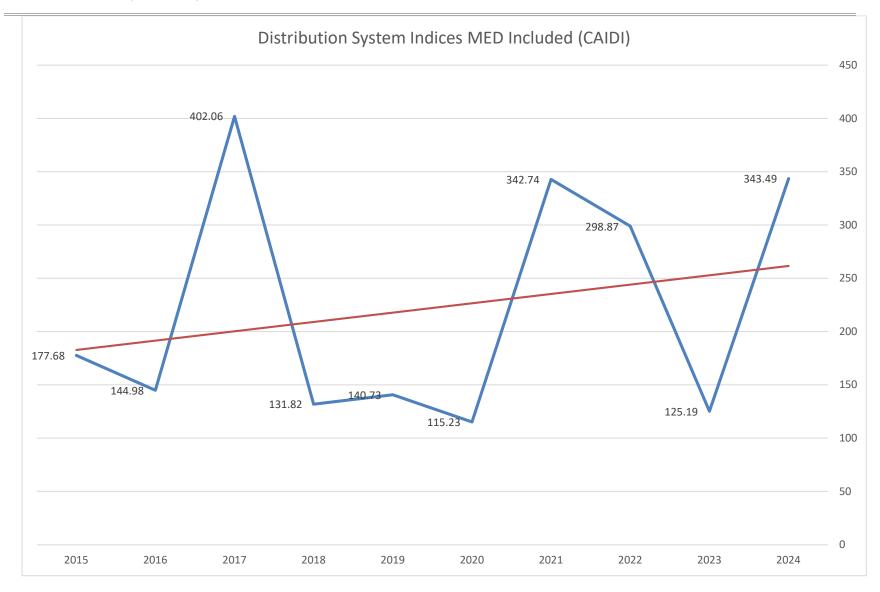
II. Transmission System Indices (MED Included and Excluded)

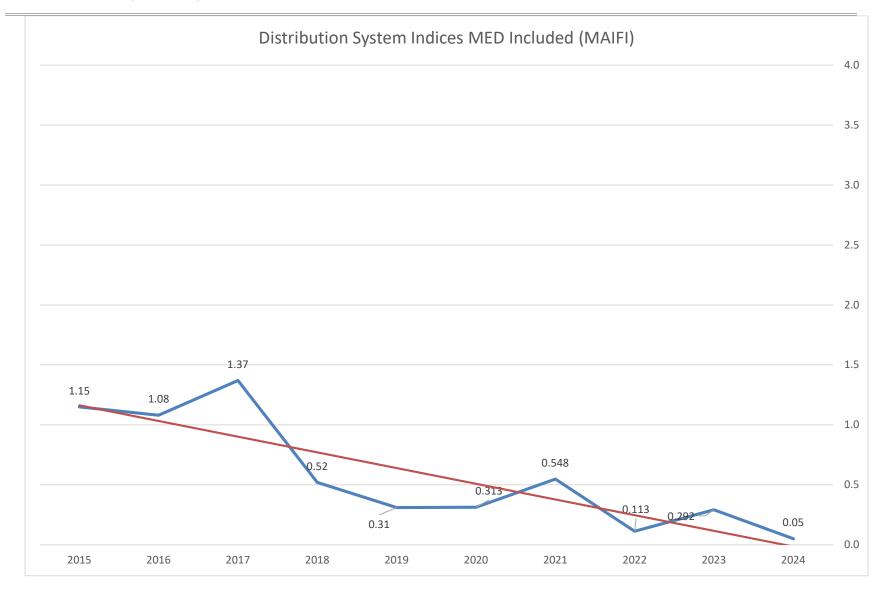
Liberty Utilities (CalPeco Electric), LLC does not own Transmission.

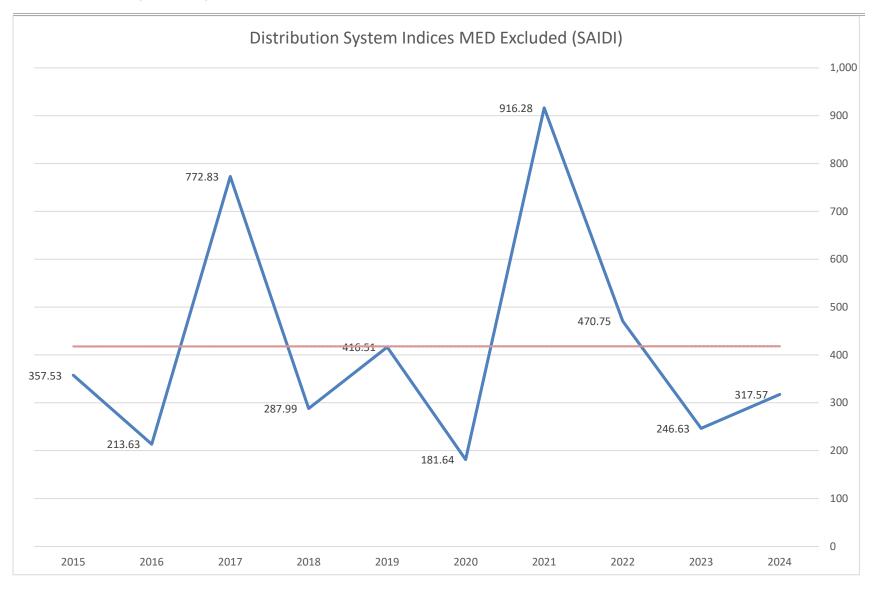
b. Separate charts showing a line graph of distribution system SAIDI, SAIFI, MAIFI, and CAIDI for the past 10 years with linear trend line (TMED included and excluded).

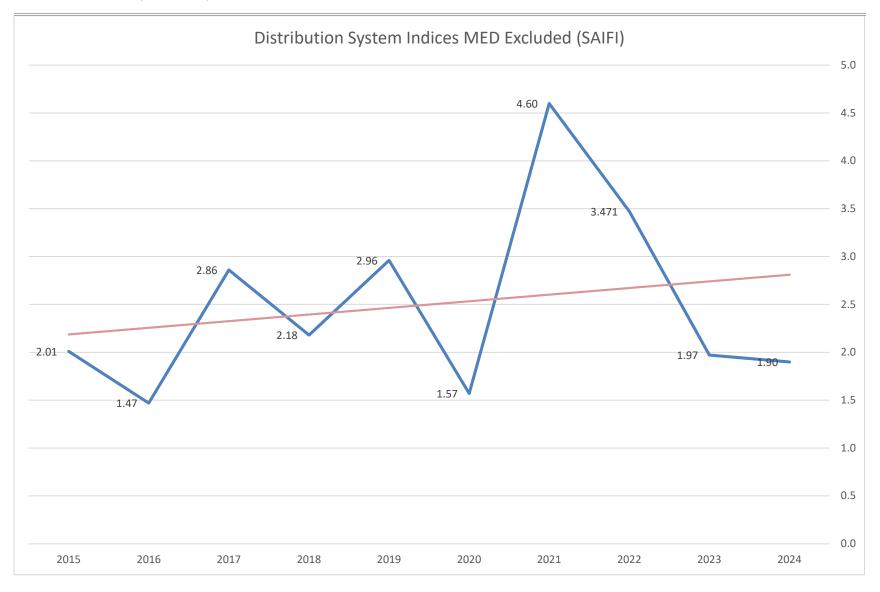


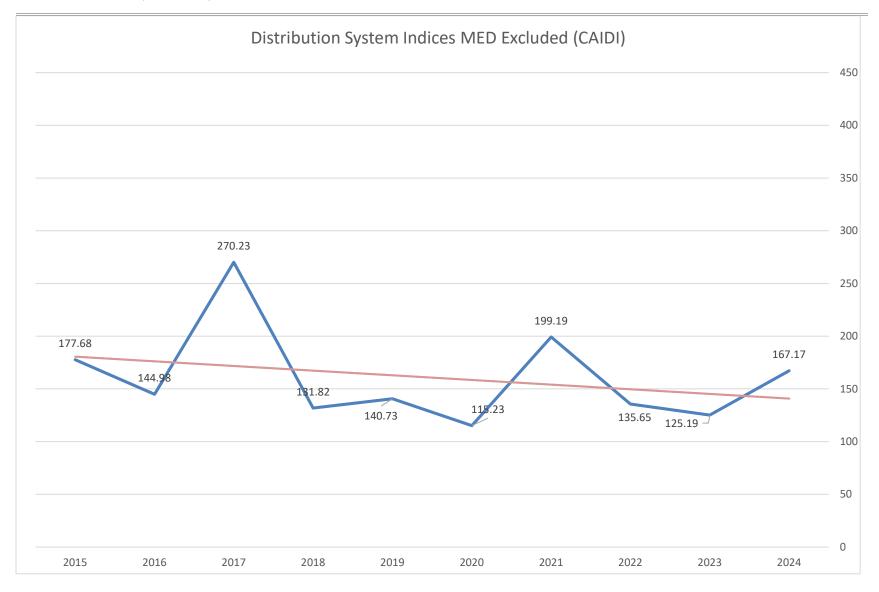


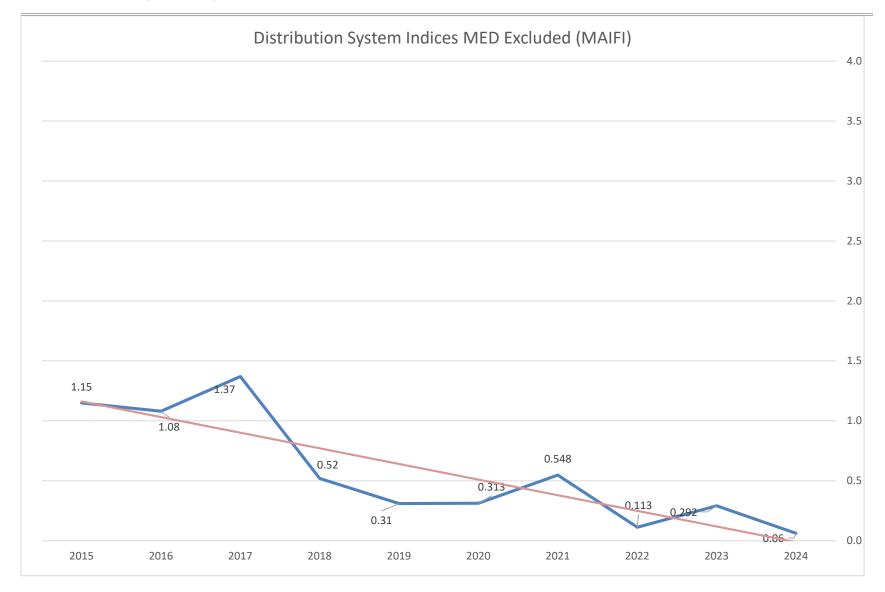












# 2) Division (or District) Reliability Indices for the past 10 years

Liberty Utilities (CalPeco Electric), LLC has one division, Lake Tahoe. See section 1 for indices.

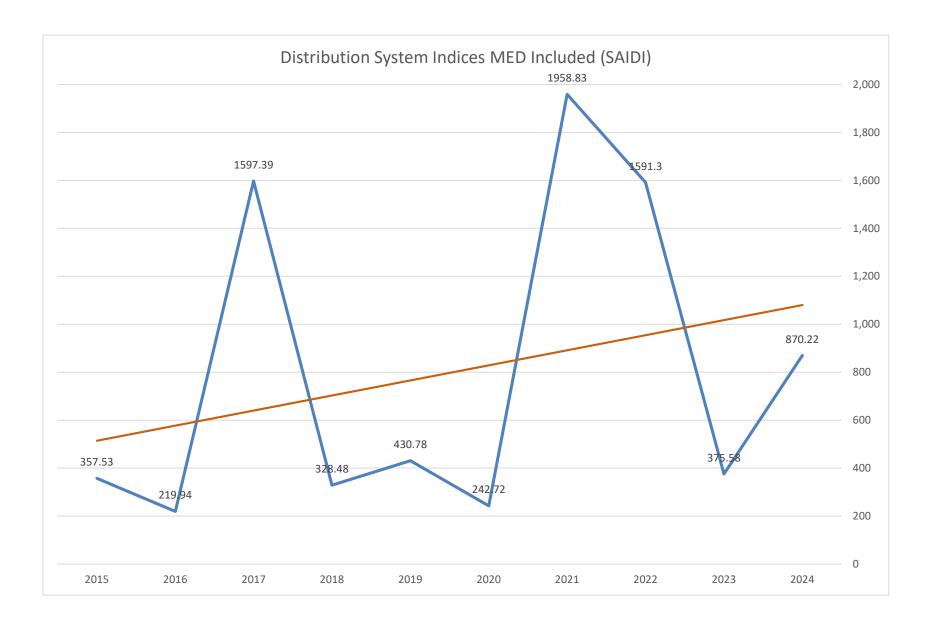
# 3) System and Division indices based on IEEE 1366 for the past 10 years including planned outages and including and excluding MED

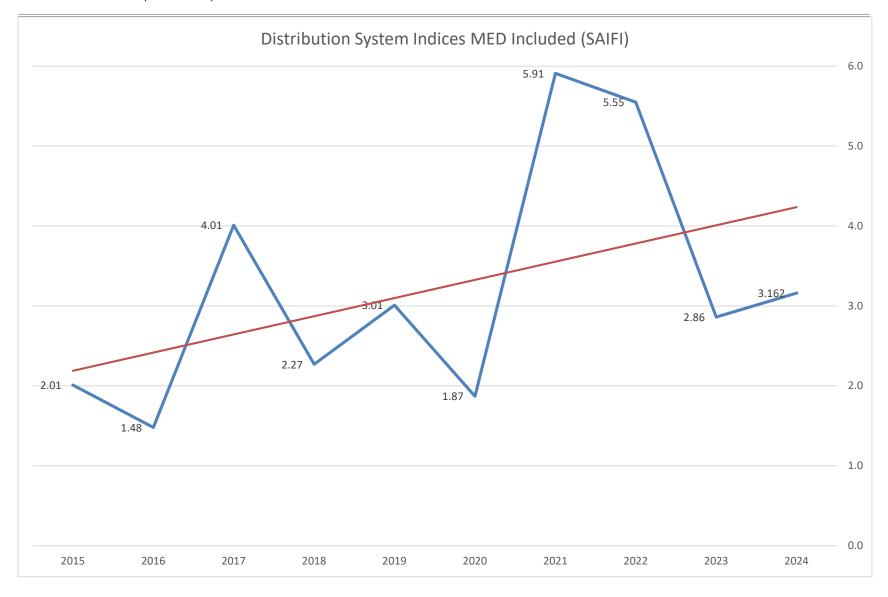
#### a. SAIDI, SAIFI, MAIFI, and CAIDI Data

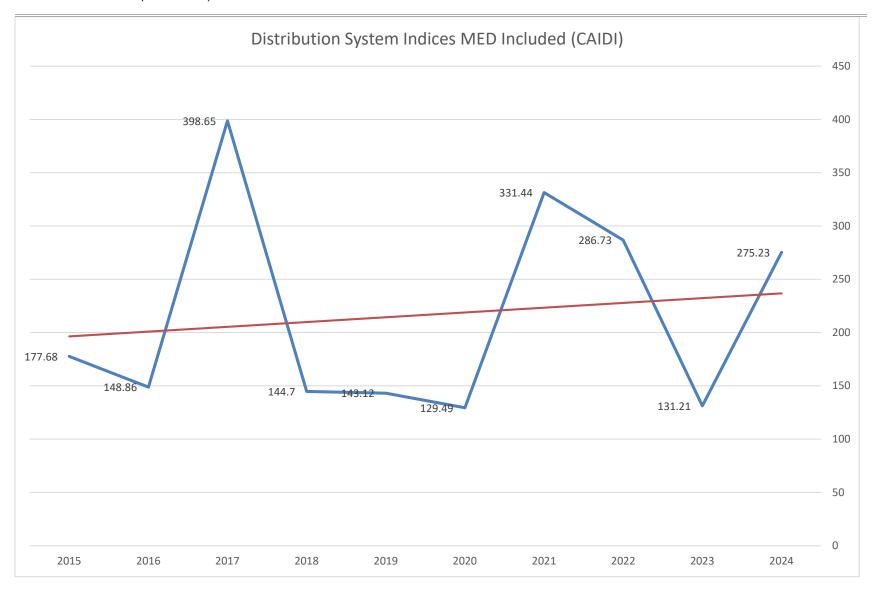
Liberty Utilities (CalPeco Electric), LLC
<u>Distribution</u> Historical System Reliability Data 10 Years (Years in Business)

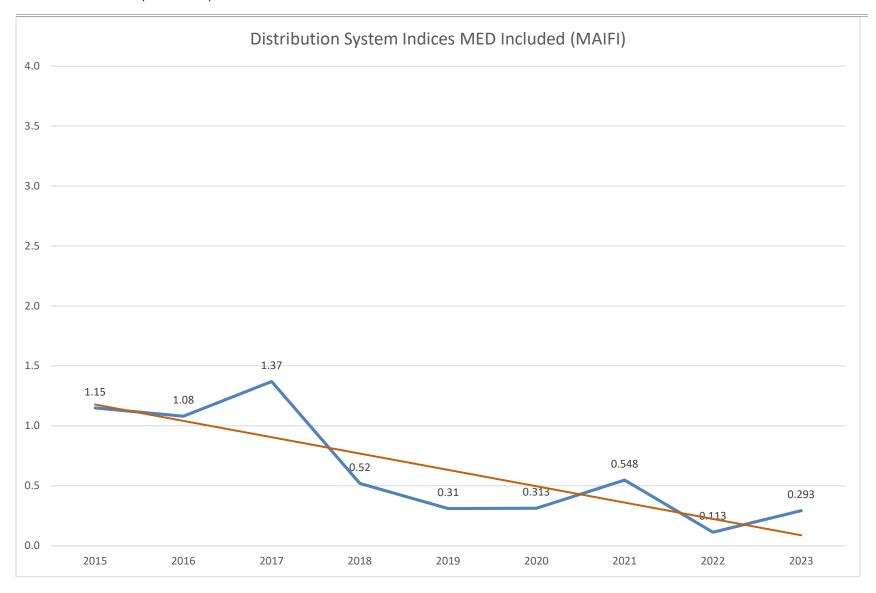
		Major Ever	nt Included	
Year	SAIDI	SAIFI	CAIDI	MAIFI
2024	870.22	3.162	275.23	0.08
2023	375.58	2.86	131.21	.293
2022	1591.3	5.55	286.73	0.113
2021	1958.83	5.91	331.44	0.548
2020	242.72	1.87	129.49	0.313
2019	430.78	3.01	143.12	0.31
2018	328.48	2.27	144.7	0.52
2017	1597.39	4.01	398.65	1.37
2016	219.94	1.48	148.86	1.08
2015	357.53	2.01	177.68	1.15

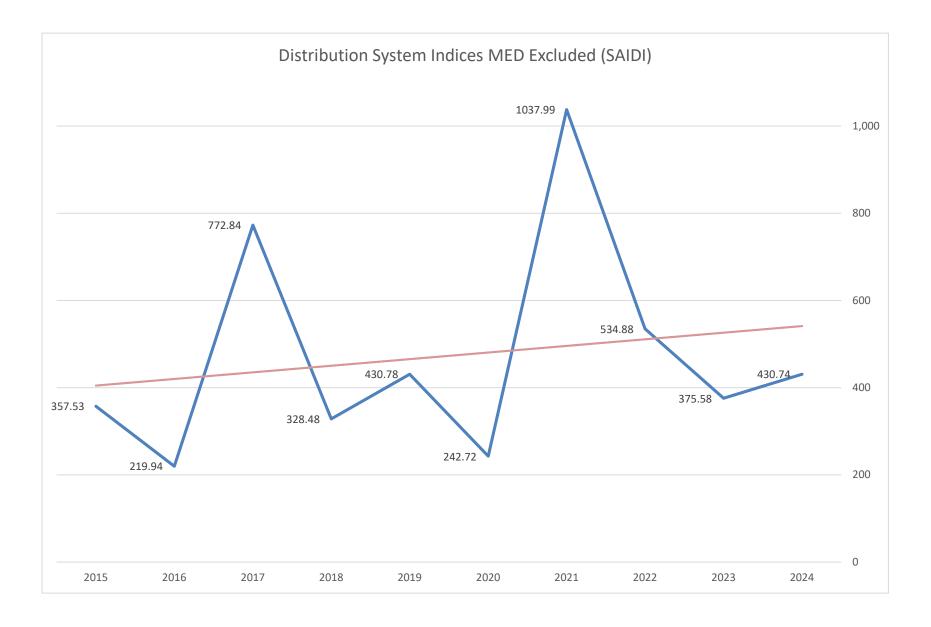
	Major Even	t Excluded	
SAIDI	SAIFI	CAIDI	MAIFI
430.74	2.474	174.09	0.08
375.58	2.86	131.21	.293
534.88	3.91	136.72	0.113
1037.99	5.14	201.94	0.548
242.72	1.87	129.49	0.313
430.78	3.01	143.12	0.31
328.48	2.27	144.7	0.52
772.84	2.89	267.42	1.37
219.94	1.48	148.86	1.08
357.53	2.01	177.68	1.15

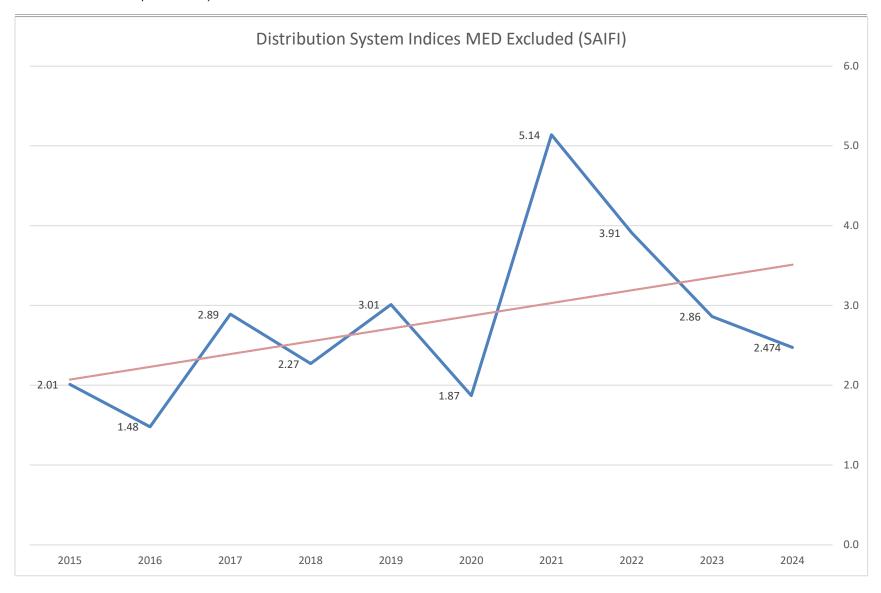


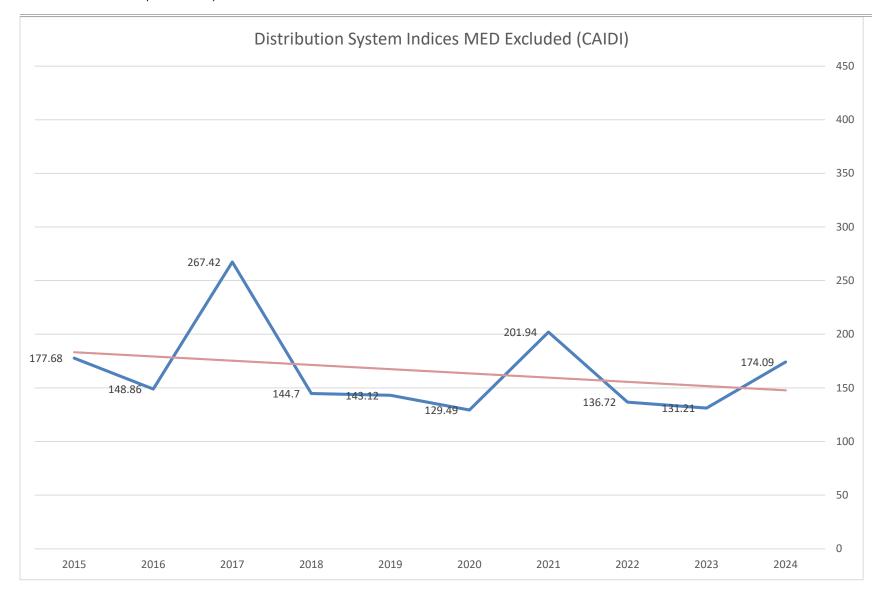


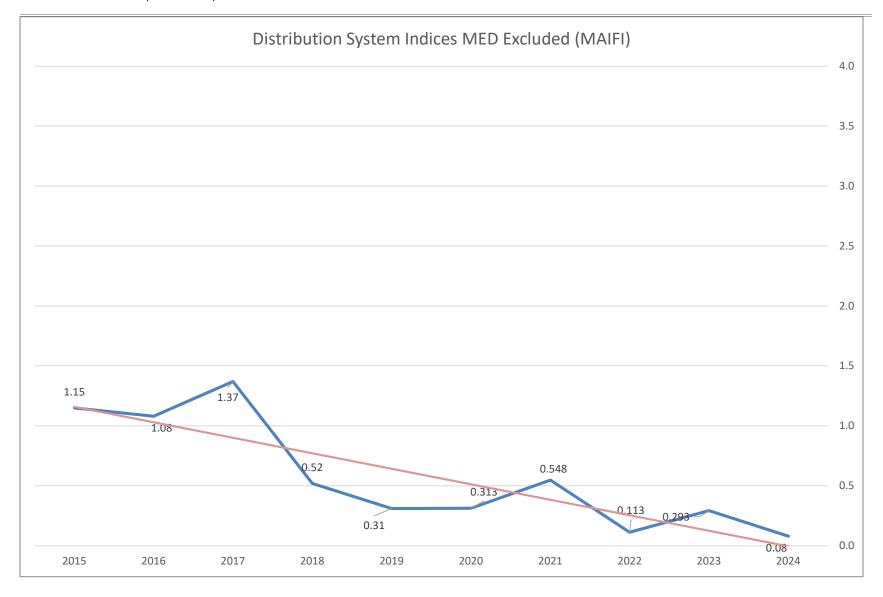










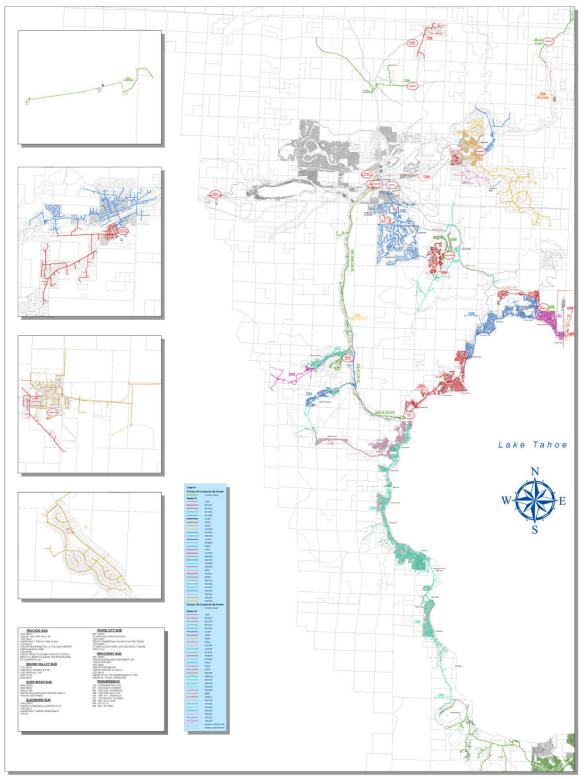


b. The number, date, and location of planned outages

			,,			Number o	of Planne	d Outage	s By Yea	ır	
Circuit	District	2024	2023	2022	2021	2020	2019	2018	2017	2016	2015
31	Tahoe	6	3	2	5	3		1			1
32	Tahoe	8	4	4	17	4	1		2	1	
41	Tahoe	2		2		6				1	
42	Tahoe			2							
51	Tahoe	2	4	2							
201	Tahoe			1	3			7			
204	Tahoe			1	1		2			1	
257	Tahoe	1									
1261	Tahoe		10	7	5	7	1	1			
1296	Tahoe	16	4	1		2		1	2		5
2200	Tahoe		1		1		1				1
2300	Tahoe	3	26	1	2		1	1			1
3100	Tahoe	16	120	12	7	2	8	5	1		
3101	Tahoe	6	81	11	5	3	3				
3200	Tahoe	13	88	6	22	1	3	5			1
3300	Tahoe	26	148	16	19	3	8	10	2		3
3400	Tahoe	44	65	12	23	1	2	4	3		5
3500	Tahoe	20	170	4	9	6	15		6		1
3501	Tahoe	4	139	10	7		3	3			2
4201	Tahoe	3	14	4	3		1	1		1	
4202	Tahoe	5	1	6	8	2	5	3	4		
4203	Tahoe										
5100	Tahoe	1	1		1	1					
5200	Tahoe	7	36	9		1	5	4	1		4
5201	Tahoe	19	9	7	2		8	1	5	5	4
7100	Tahoe	21	4	7	4	4	1	2	1		
7200	Tahoe		1				1	1			1
7201	Tahoe	8	9	3	4	1	1		4	1	2
7202	Tahoe	4	2	3	1	3	3	1	1		2
7203	Tahoe	3		3	2		3	2			2
7204	Tahoe			1							
7300	Tahoe	71	16	13	14	8	20	14	5	6	4
7400	Tahoe	2	6		4	1	4	8	2	1	1
7600	Tahoe	1	2	1			1	1			1
7700	Tahoe		3	3		4					
7800	Tahoe										
7900	Tahoe	1	2	1		2	1				
8100	Tahoe		1								
8200	Tahoe	2	15		2	1	1	2	7	3	2

8300	Tahoe		1			1	1	1	2		6
8400	Tahoe	1				1		7			
8500	Tahoe			1	1	2				1	
8600	Tahoe										4
8700	Tahoe		1								

# 4) Service territory map including divisions of districts



#### 5) Top two worst performing circuits (WPC) excluding TMED

For each of these circuits each utility shall include the following information in its annual report: 1) Circuit Name; 2) District/Division; 3) Customer Count; 4) Substation name; 5) Circuit-miles; 6) Percentage underground, or "% UG"; 7) Percentage overhead or "% OH"; 8) Number of mainline/feeder/backbone outages resulting in the operation of either a circuit breaker ("CB") or automatic re-closer ("AR"); and, 9) its preferred reliability metric.

Custom		Custome Substation		Oimereit.	Facilities		Number of Mainline/	+O:i4	Oimenit
Circuit	District	r Count	Name	Circuit Miles	OH UG		Feeder/Backbone Outages Per Year	*Circuit SAIDI	Circuit SAIFI
1202*	Tahoe	753	Topaz	59.1	94.0%	6.0%	0	370	4.68
3400	Tahoe	3,261	Meyers	66.1	82.0%	18.0%	2	835	4.04

Note: Preferred Metric is the average of circuit SAIDI over a 3 year period.

<sup>\*</sup> A circuit that has been identified as deficient in the previous year's report.

- II. Any circuit appearing on this list of "deficient" WPC circuits that also appeared on the previous year's list would be marked by an asterisk. For each asterisked circuit, each utility shall provide the following information:
  - I. An explanation of why it was ranked as a "deficient" circuit, i.e., the value of the metric used to indicate its performance;
  - II. A historical record of the metric;
  - III. An explanation of why it was on the deficiency list again;
  - IV. An explanation of what is being done to improve the circuit's future performance and the anticipated timeline for completing those activities (or an explanation why remediation is not being planned); and
  - V. A quantitative description of the utility's expectation for that circuit's future performance.

The Topaz 1202 (previously 1261) circuit was noted as a deficient circuit in 2020, 2021, 2022, 2023, and 2024. The 3-year average circuit SAIDI score remains high due to extreme weather conditions over the past 3 years.

There were 14 unplanned outages in 2024 for the 1202 circuit.

The historical metric for Topaz 1202 based on a 3-year average:

- 2024 370
- 2023 1925
- 2022 2313

There are currently no plans in place that would remedy loss of source outages, which account for several outages experienced by customers on this circuit. The circuit is a radial line, sourced by an NV Energy substation in Nevada.

The circuit performance in 2024 measured alone was below average compared to historical values. This circuit often experiences events considered to be outliers resulting from extreme weather conditions. 2 of the unplanned outages for this circuit in 2024 were caused by weather.

III. Language to explain how the IOUs' include a cost effectiveness review as part of their respective internal review processes for circuit remediation projects.

I. Definitions of terms, acronyms, limitations, and assumptions;

#### **Definitions**

**WPC- Worst Performing Circuits** 

#### <u>Assumptions</u>

Our analysis excludes planned outages and TMED outages.

II. A clear explanation of the utility's process to determine the worst performing circuits:

The top 2 Worst Performing Circuits (WPC) are determined based upon the calculated average of circuit SAIDI over a 3 year period. This index is calculated on sustained outages by taking the total customer minutes of interruption and dividing by the number of customers on the circuit. Three years' worth of data is included and averaged in order to account for anomalies and tracking the impact of phased improvement projects.

III. A clear explanation of the utility's process to determine cost-effective remediation projects. This shall include why the utility may decide to implement a project to address one worst performing circuit issue while deciding to not implement a project to address a different worst performing circuit.

The Regional Engineer presents proposals for reliability improvement projects along with a circuit analysis, cost-benefit analysis, and details on customer impact to the Business Manager, Engineering Manager, and Senior Director of Operations. Collectively, the group determines which projects to approve or suggest alternatives and further analysis.

# 6) Top 10 major unplanned power outage events within a reporting year

- a. The cause of each outage event; and
- b. The location of each outage event.

Rank	Outage Date	Cause	Location	Customer Impact	SAIDI	SAIFI
1	2/20/2024	Equipment	Lake Tahoe	4479	4.26082579	0.091101393
2	11/11/2024	Equipment	Lake Tahoe	4310	8.9874981	0.087663989
3	8/13/2024	Act Of Man	Lake Tahoe	4286	5.07569059	0.087175836
4	3/25/2024	Equipment	Lake Tahoe	3812	12.0919061	0.077534832
5	7/7/2024	Animal	Lake Tahoe	3808	11.3856605	0.077453473
6	8/1/2024	Planned	Lake Tahoe	3510	2.1820421	0.071392251
7	6/11/2024	Planned	Lake Tahoe	3494	17.0012407	0.071066816
8	3/8/2024	UNKNOWN	Lake Tahoe	3721	1.69649173	0.075683921
9	2/20/2024	Equipment	Lake Tahoe	3188	2.55649547	0.064842876
10	1/13/2024	Animal	Lake Tahoe	3185	1.54986203	0.065099642

<sup>\*</sup>Based on customer impact

#### 7) Summary list of 2024 TMED per IEEE 1366

- a. The number of customers without service at periodic intervals for each TMED;
- b. The cause of each Major Event (ME); and
- c. The location of each ME.

Date	# of Customers w/o Service	Cause of ME	Location of ME
3/1/2024	7857	Loss of Supply/Weather	Lake Tahoe
8/11/2024	51	Loss of Supply/Planned	Lake Tahoe

# 8) Historical 10 largest unplanned outage events for the past 10 years\*

<sup>\*</sup>Based on Customers Affected

Rank	Description	Date	<b>Customers Affected</b>	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Equipment	2/20/2024	4479	35.5	3,491	NO
2	Equipment	11/11/2024	4310	1.7	7,365	NO
3	Act Of Man	8/13/2024	4286	1.4	4,159	NO
4	Equipment	3/25/2024	3812	13.9	9,908	NO
5	Animal	7/7/2024	3808	2.5	9,330	NO
6	Planned	8/1/2024	3510	3.4	1,788	NO
7	Planned	6/11/2024	3494	16.3	13,931	NO
8	UNKNOWN	3/8/2024	3721	1.9	1,390	NO
9	Equipment	2/20/2024	3188	35.5	2,095	NO
10	Animal	1/13/2024	3185	2.3	1,264	NO

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Faulted Underground Cable	11/2/2023	4,214	128.59	22201.78	NO
2	CB Lockout	1/5/2023	4400	22.87	10161.25	NO
3	CB Lockout	1/4/2023	1588	6.1	9623.48	NO
4	CB Lockout	3/14/2023	4264	1.55	6609.20	NO
5	CB Lockout	7/29/2023	2296	171.14	6548.88	NO
6	CB Lockout	9/19/2023	3560	17.87	5450.38	NO
7	Broken Pole, all 3 phases down	1/14/2023	154	34.9	5014.33	NO
8	CB Lockout	1/15/2023	4277	1.17	4559.33	NO
9	CB Lockout	10/15/2023	2301	1.02	4218.50	NO
10	Recloser Lockout	5/18/2023	746	7.3	4062.98	NO

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	CB Lockout	12/11/2022	4573	66.7	112,064	YES
2	CB Lockout	12/11/2022	4013	20.1	80,461	YES
3	CB Lockout	12/12/2022	6382	28.3	64,328	YES
4	CB Lockout	12/11/2022	2290	34.0	47,436	YES
5	CB Lockout	12/11/2022	2357	20.0	47,022	YES
6	Blown Fuse	12/11/2022	698	55.4	38,681	YES

7	CB Lockout	12/11/2022	3559	9.6	34,048	YES
8	CB Lockout	12/31/2022	4400	11.0	27,554	YES
9	PTR Lockout	12/10/2022	484	68.7	26,256	NO
10	Loss of Source	12/31/2022	4273	7.6	24,287	YES

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	CB Lockout	12/11/2022 5:14	4573	66.7	112,064	YES
2	CB Lockout	12/11/2022 2:55	4013	20.1	80,461	YES
3	CB Lockout	12/12/2022 17:45	6382	28.3	64,328	YES
4	CB Lockout	12/11/2022 8:45	2290	34.0	47,436	YES
5	CB Lockout	12/11/2022 5:14	2357	20.0	47,022	YES
6	Blown Fuse	12/11/2022 4:49	698	55.4	38,681	YES
7	CB Lockout	12/11/2022 0:43	3559	9.6	34,048	YES
8	CB Lockout	12/31/2022 12:59	4400	11.0	27,554	YES
9	PTR Lockout	12/10/2022 22:58	484	68.7	26,256	NO
10	Loss of Source	12/31/2022 14:02	4273	7.6	24,287	YES

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	CB Lockout	7/28/2021	10812	1.2	12,974	No
2	Recloser Lockout	12/15/2021	5348	1.85	9,894	No
3	Wire Down	12/14/2021	4530	6.15	27,860	Yes
4	CB Lockout, Lighting	7/29/2021	4522	0.98	4,447	No
5	Device failure	12/14/2021	4387	9.55	41,896	Yes
6	Loss of Source	10/7/2021	4374	0.1	437	No
7	Loss of Source	10/8/2021	4374	5.78	25,296	No

8	CB Lockout	12/24/2021	4368	1.7	7,426	No
9	CB Lockout	12/13/2021	4362	6.82	29,734	No
10	Loss of Source	2/25/2021	4183	0.62	336	No

Rank	Description	Date	Customer s Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Operations Error	7/28/2020	5,291	0.68	3597.8	No
2	CB Lockout, Lightning possible	8/24/2020	3,835	1.63	6251.05	No
3	Unknown	11/6/2020	3,728	1.3	4846.4	No
4	Wind/Debris	8/12/2020	3,724	0.56	2085.44	No
5	Animal	9/10/2020	3,451	0.3	1035.3	No
6	Animal	9/6/2020	3,266	0.86	2808.7	No
7	Animal	10/23/2020	3,266	0.28	914.5	No
8	Animal	7/28/2020	2,555	0.46	705.8	No
9	Device failure	7/2/2020	2,555	1.43	3653.6	No
10	Operations Error	7/28/2020	2,555	0.68	1737.4	No

Rank	Description	Date	Customer s Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Third Party - Contractor Dig In	10/1/2019	10,490	3.88	40701.2	No
2	Equipment Failure	2/22/2019	8,560	4.42	37835.2	No
3	Third Party - Contractor Dig In	10/3/2019	7,841	0.18	1411.38	No

4	Hardware Failure	2/26/2019	4,485	3.5	15697.5	No
5	Tree	1/18/2019	4,448	1.76	7828.48	No
6	Hardware Failure	3/6/2019	4,448	0.82	3647.36	No
7	Animal	11/11/2019	4,245	0.6	2547	No
8	Third Party – Line Contact	9/21/2019	3,712	0.43	1596.16	No
9	Animal	6/7/2019	3,529	0.47	1658.63	No
10	Tree	6/7/2019	3,507	1.51	5295.57	No

Rank	Description	Date	Customer s Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Third Party - Switching	5/17/2018	17,315	2.51	91301.9	No
2	Loss of Source – External System	12/12/2018	7,552	0.1	755.2	No
3	Trees	10/17/2018	7,398	6.32	14218.8	No
4	Loss of Source – External System	12/12/2018	7,089	0.1	708.9	No
5	Hardware Failure	10/3/2018	4,678	3.61	6958.1	No
6	Trees - Major Storm	6/9/2018	4,485	9.38	6420.1	No
7	Unknown	11/12/2018	4,154	1.76	7338.7	No
8	Unknown	1/4/2018	3,529	0.2	705.8	No
9	Loss of Source – External System	12/12/2018	3,434	0.1	343.4	No
10	Loss of Source – External System	8/4/2018	2,721	2.96	8072.3	No

Rank	Description	Date	Customer s Affected	Longest Interruption (hours)	Customers-hours affected	CPUC Major Event?
1	Loss of Source – External System	1/10/17	22,000	26.12	5,745,66.7	No
2	Loss of Source – External System	8/28/2017	8,643	1.15	9,939.5	No
3	Major Storm	1/8/2017	4,497	9.75	43,845.8	No
4	Major Storm	2/8/2017	4,497	2.58	11,617.3	No
5	Trees	4/7/2017	4,497	1.91	8,619.3	No
6	Trees/Major Storm	2/22/2017	4,105	1.68	6,910.1	No
7	Major Storm	1/5/2017	3,517	8.72	30,656.5	No
8	Major Storm	2/21/2017	3,517	0.4	1,406.8	No
9	Underground Fault	5/30/2017	3,486	2.82	9,818.9	No
10	Carp/Pole	6/6/2017	3,486	1.97	6,855.8	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Loss of Source – External System	3/13/2016	6,882	0.75	5,046.80	No
2	Wind/Trees	10/16/2016	4,125	1.75	7,150.00	No
3	Underground Fault	10/4/2016	4,125	4.31	17,793.30	No
4	Downed Wire	3/22/2016	4,125	1.70	6,294.80	No
5	Car/Pole	3/13/2016	3,517	1.00	3,957.90	No
6	Failed Overhead Hardware/Material	1/1/2016	3,500	5.50	7,250.00	No
7	Trees	3/1/2016	3,258	0.50	1,683.30	No
8	Underground Fault	6/29/2016	2,859	8.42	3,975.10	No
9	Primary Contact – 3 <sup>rd</sup> Party	8/23/2016	2,772	5.15	2,693.25	No
10	Trees	6/15/2016	2,732	8.15	3,822.70	No

Rank	Description	Date	Customers Affected	Longest Interruption (hours)	Customers- hours affected	CPUC Major Event?
1	Storm	4/25/2015	4,120	6.50	12,380.00	No
2	Underground Fault	2/14/2015	3,587	0.50	2,511.00	No
3	Downed Wire	12/11/2015	3,587	10.00	17,251.00	No
4	Trees	2/6/2015	3,548	0.50	1,360.00	No
5	Bird/Animal	5/24/2015	3,000	6.50	12,340.00	No
6	Fire	2/20/2015	3,000	0.50	1,650.00	No
7	Weather/Lightning	7/4/2015	3,000	2.00	5,600.00	No
8	Weather/Lightning	7/7/2015	3,000	0.25	1,000.00	No
9	Operations	8/11/2015	3,000	0.25	750.00	No
10	Weather/Lightning	8/7/2015	3,000	1.75	5,400.00	No

# 9) Number of customer inquiries on reliability data and the number of days per response

CalPeco Electric did not receive any reliability inquiries in 2024.

Date Received	Date Responded	Description of Inquiry

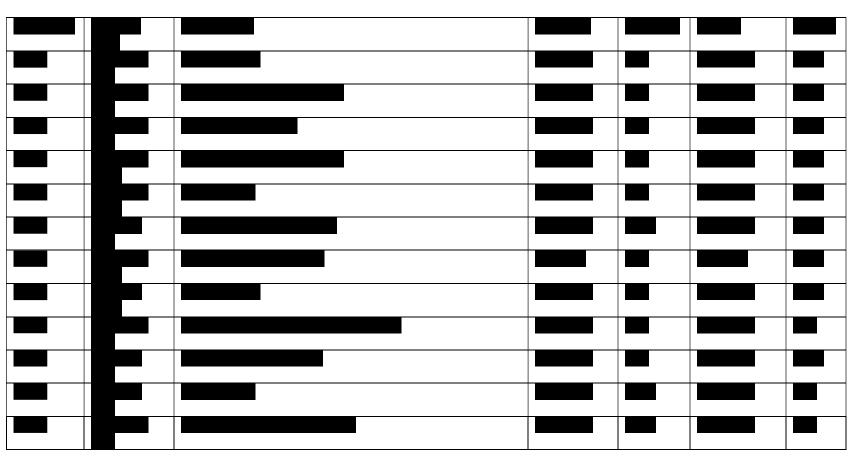
#### 10) List of PSPS's in 2024

OUTAGE ID	CREATED DATE	DESCRIPTION	OUT DATE	OUT TIME	IN DATE	IN TIME
120033506	11/22/2024 8:01	Muller 1296-R3	11/22/2024	9:02	11/22/2024	20:55
		Muller 1296-R3 and				
120033226	11/20/2024 4:35	R4	11/20/2024	5:33	11/20/2024	22:22

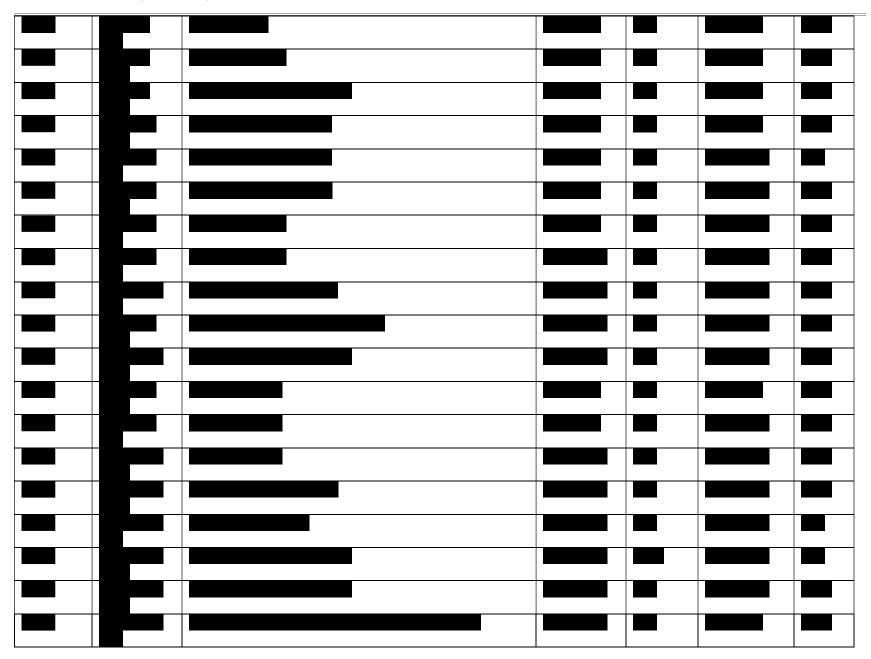
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120032672	11/11/2024 8:16	Muller 1296	11/11/2024	9:15	11/11/2024	15:30
120033227	11/20/2024 4:38	PTR Muller 1296-R4	11/20/2024	5:33	11/20/2024	22:35
	11/11/2024					
120032697	10:50	Fuses P278665	11/11/2024	9:15	11/12/2024	0:35
	11/22/2024					
120033541	21:12	Fuse P122646	11/22/2024	21:48	11/23/2024	1:13

## Appendix A: 10 Years of Planned Outage Data -- PUBLIC VERSION --

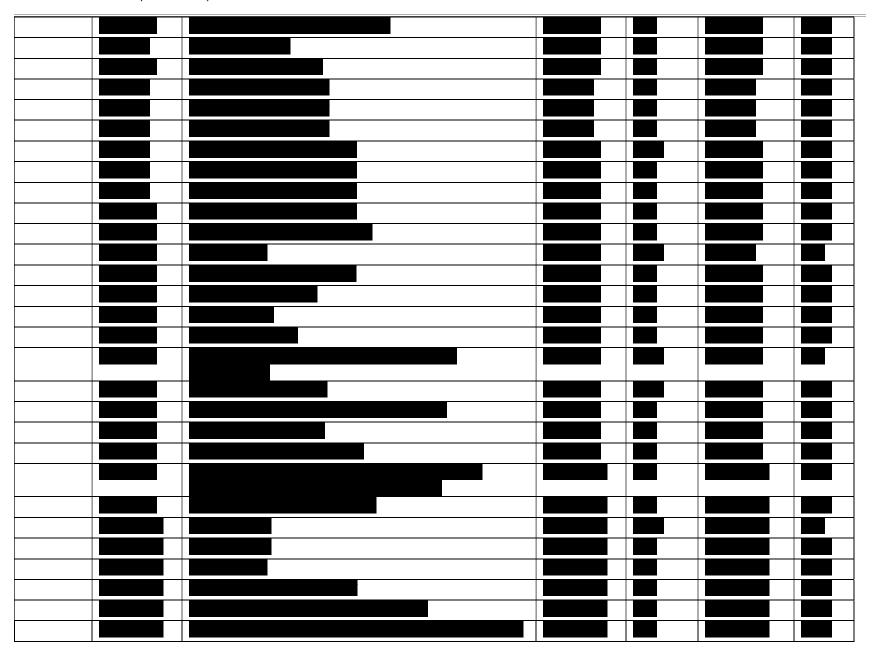


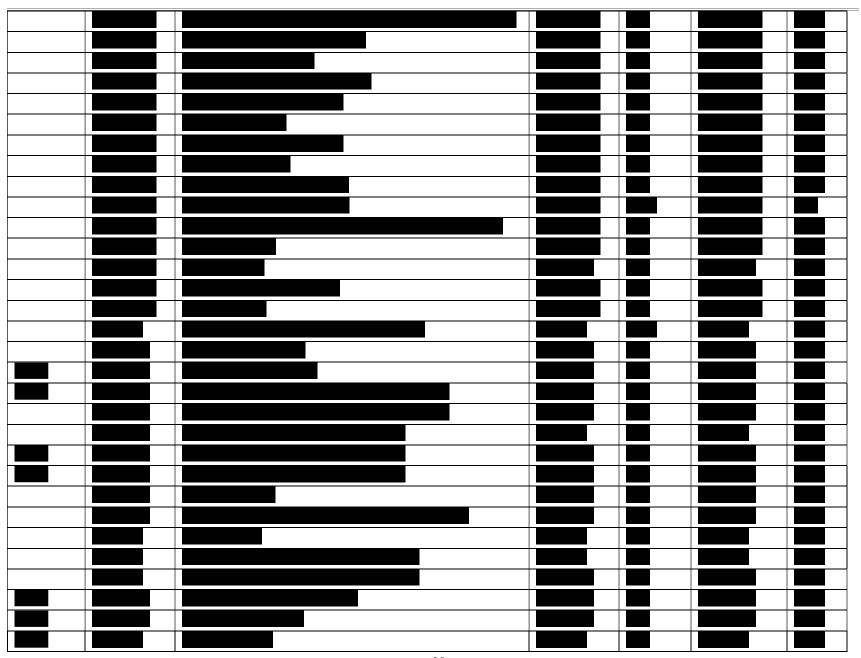


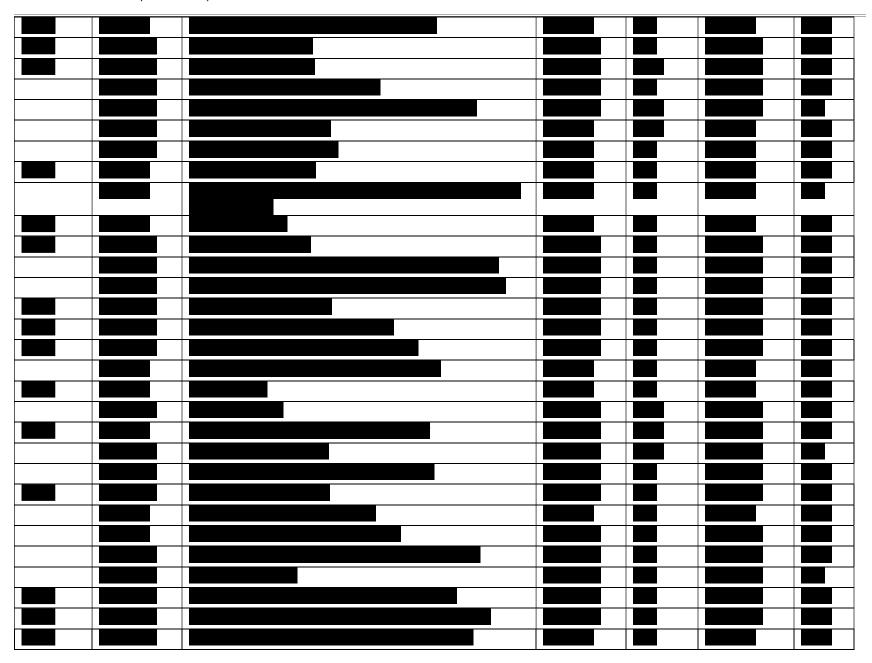


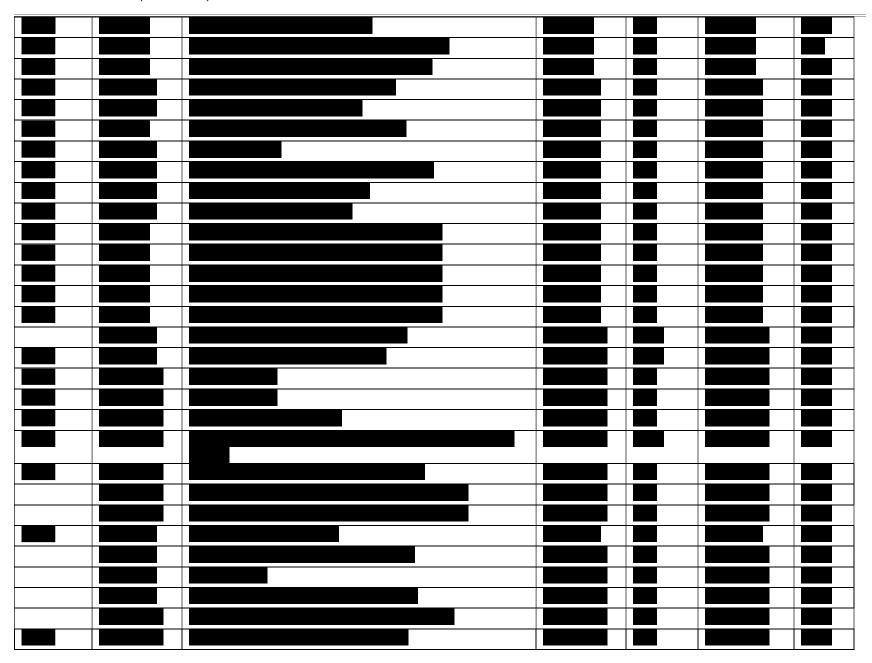
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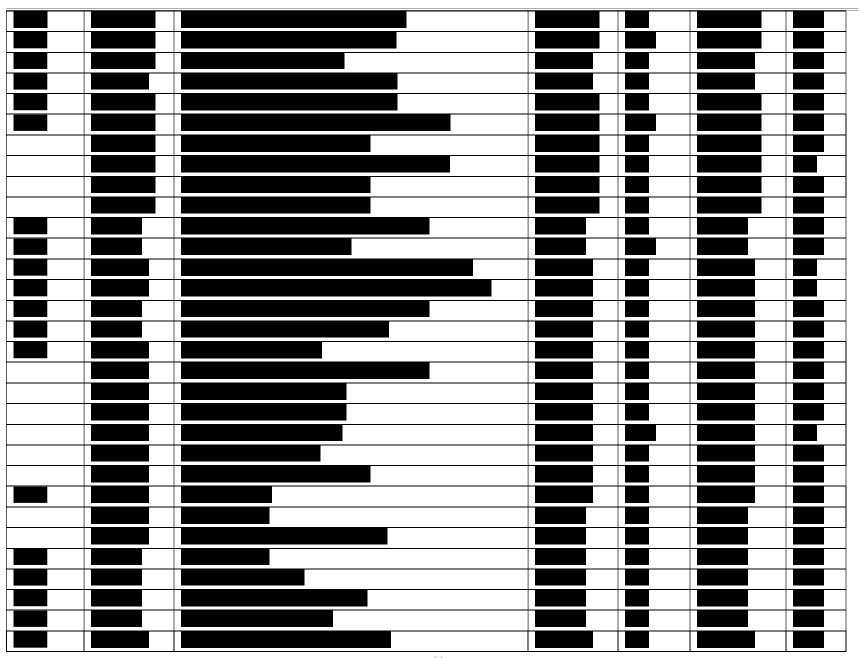


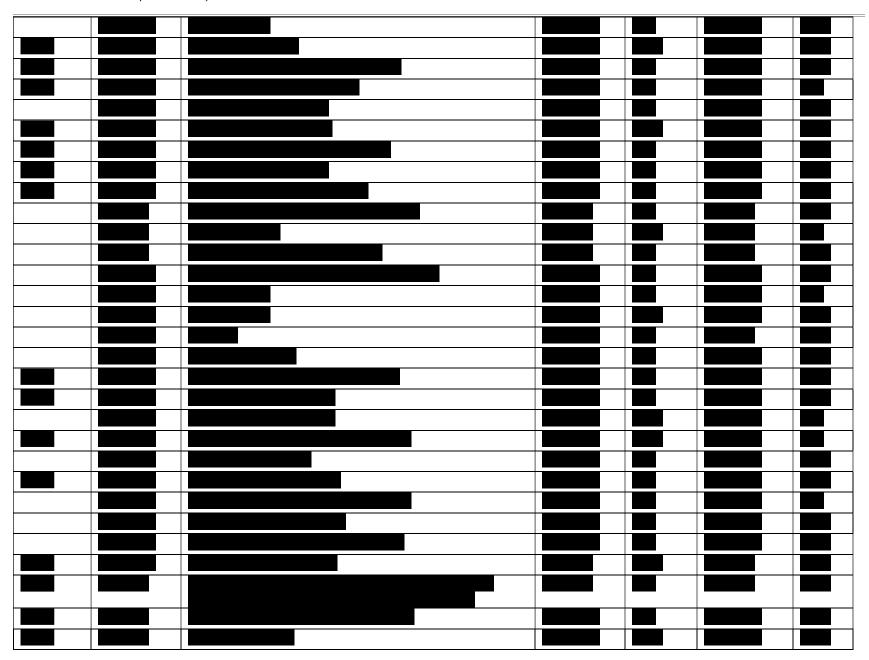








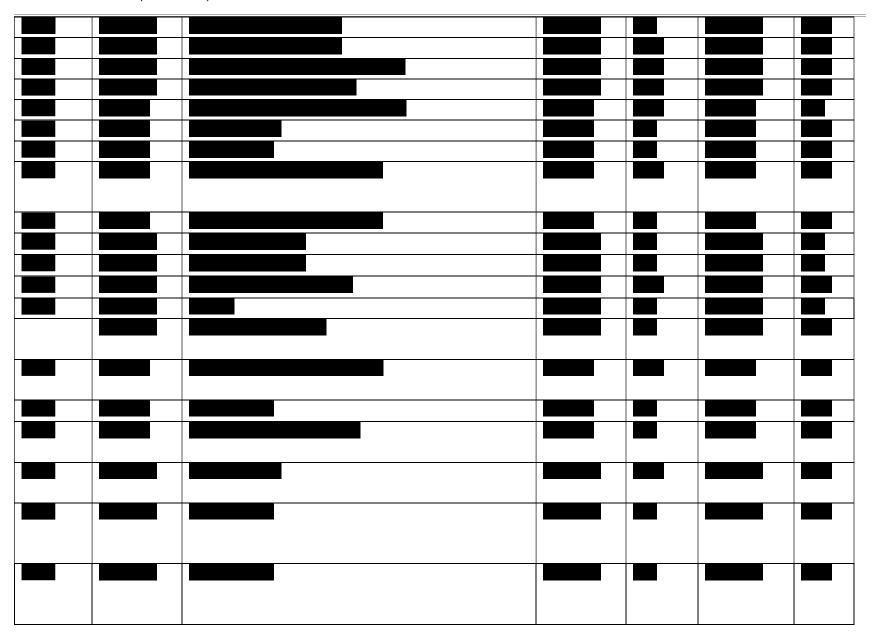




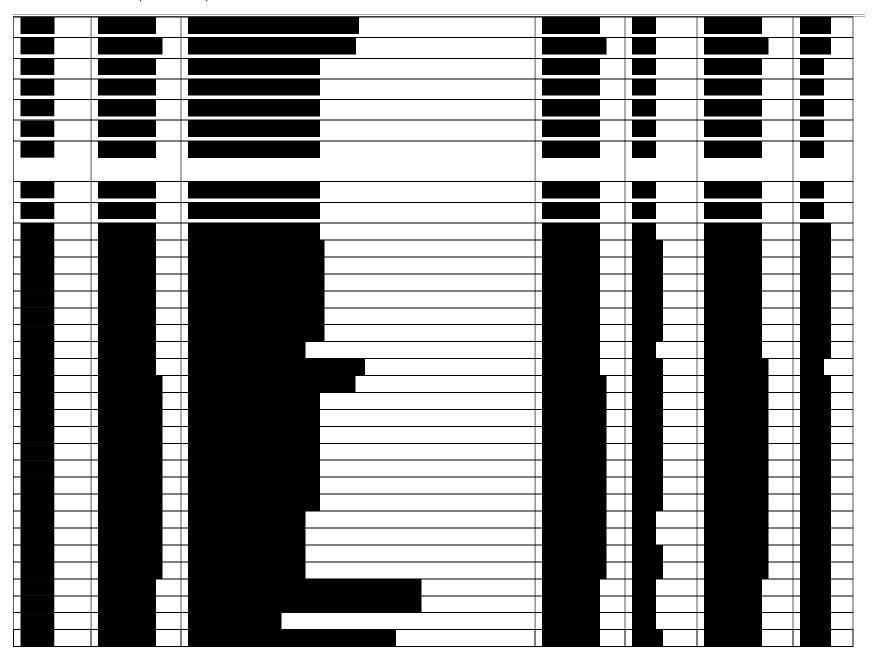


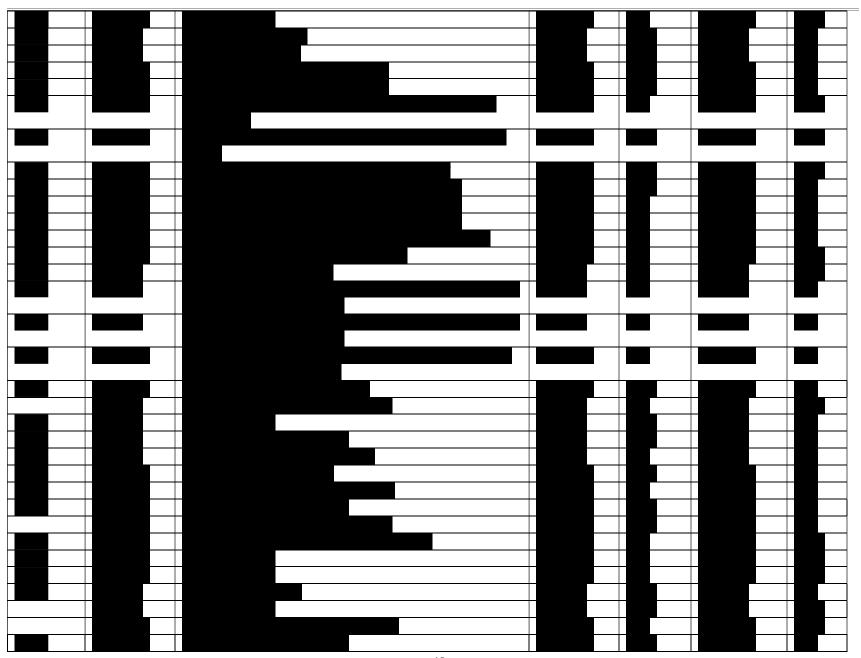


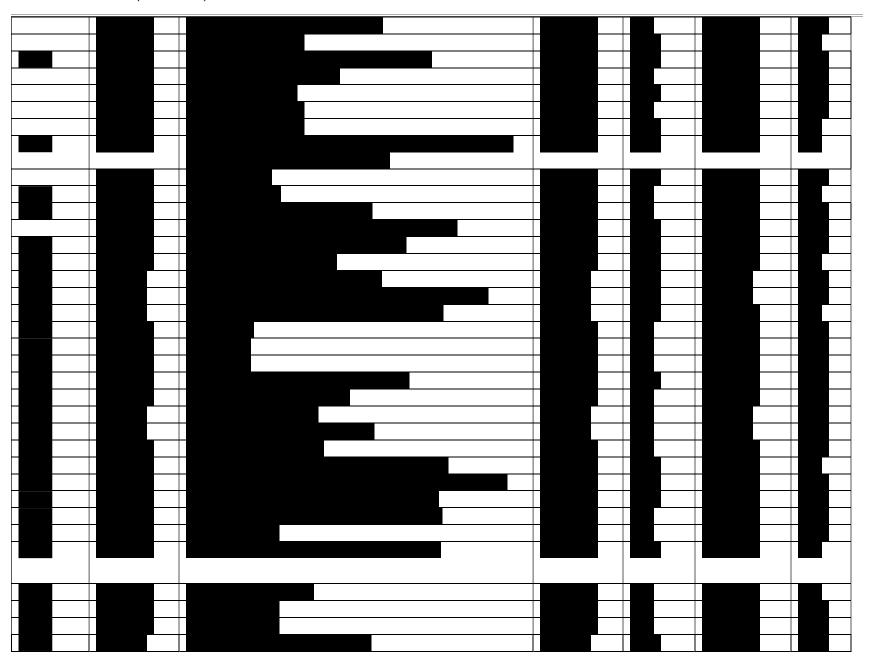
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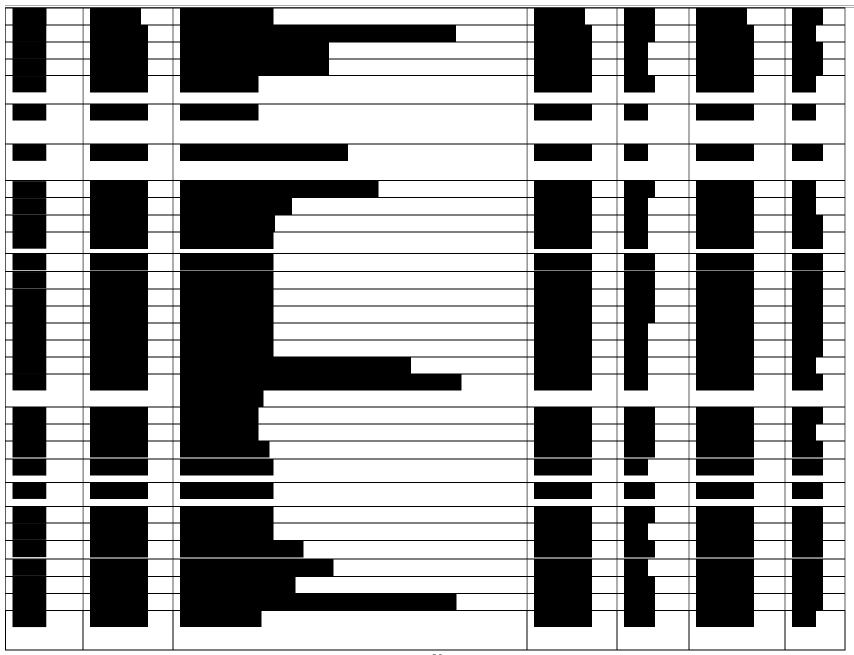


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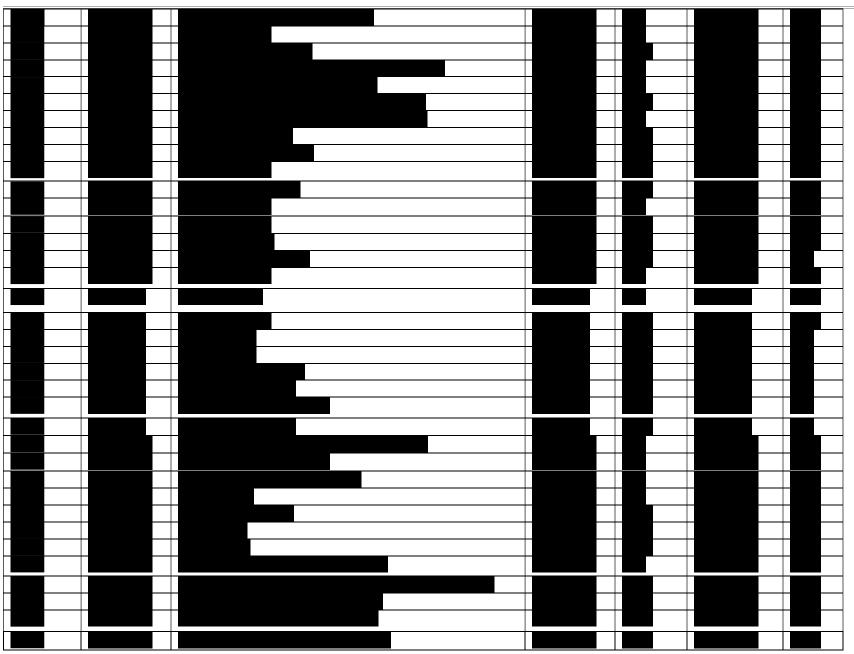
























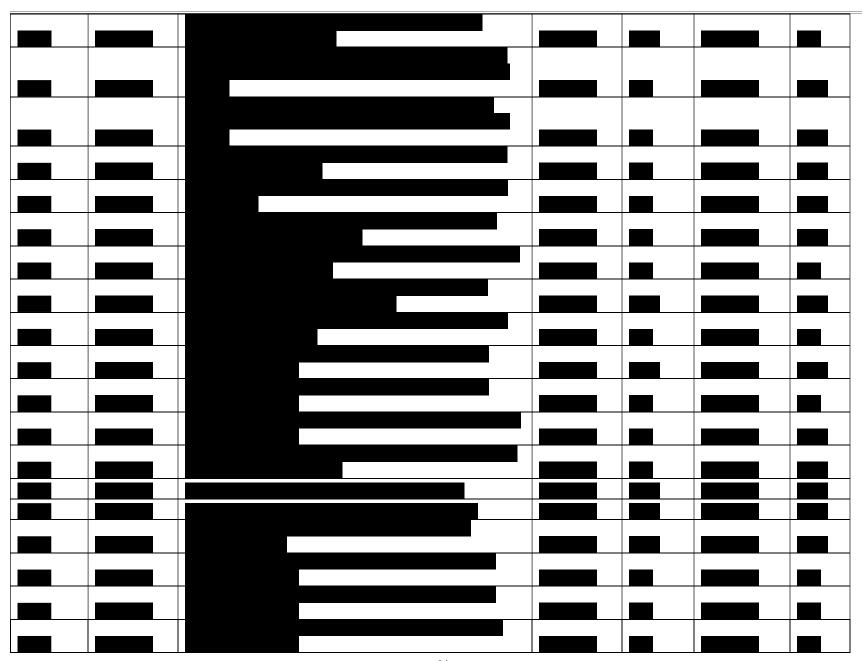


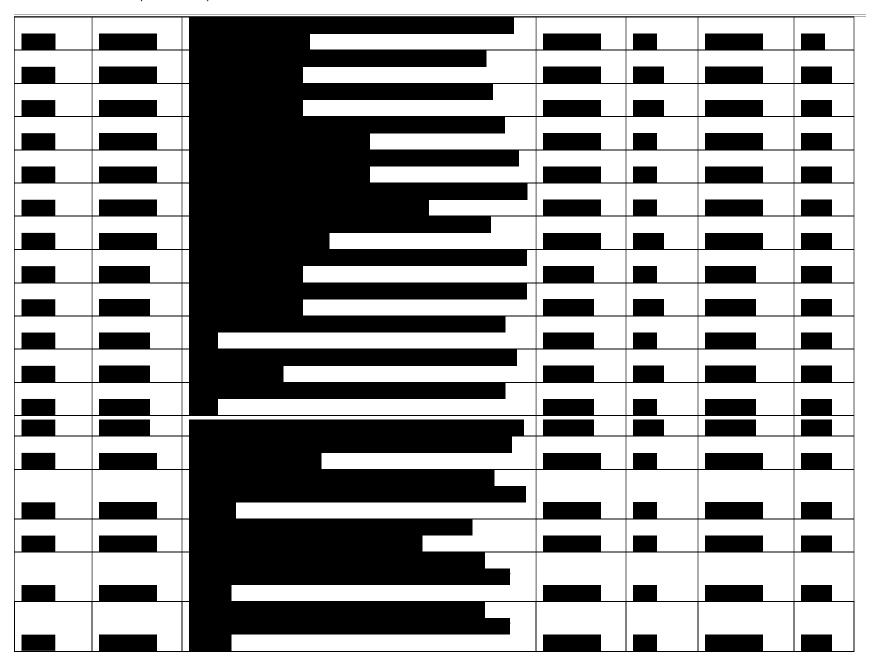




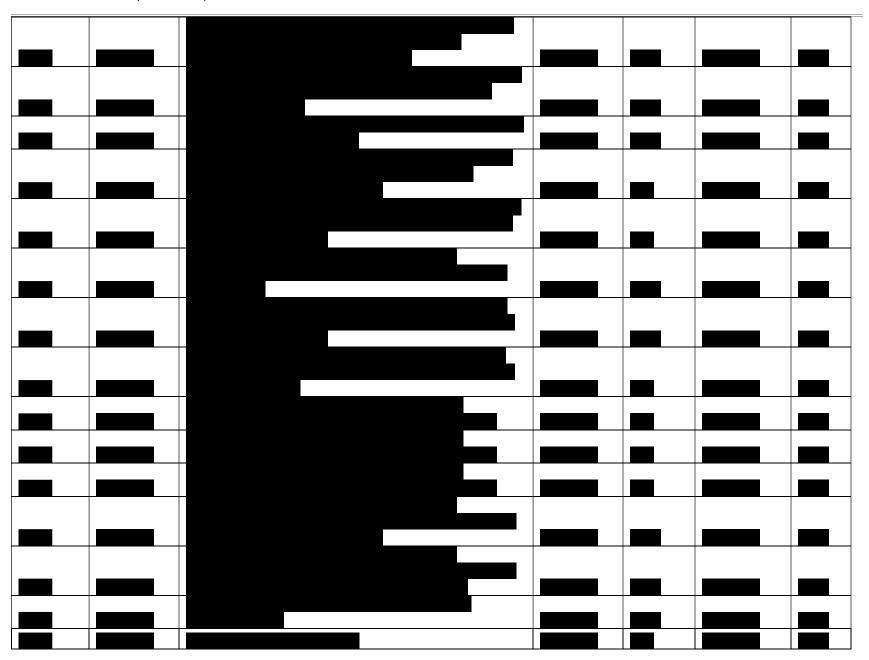






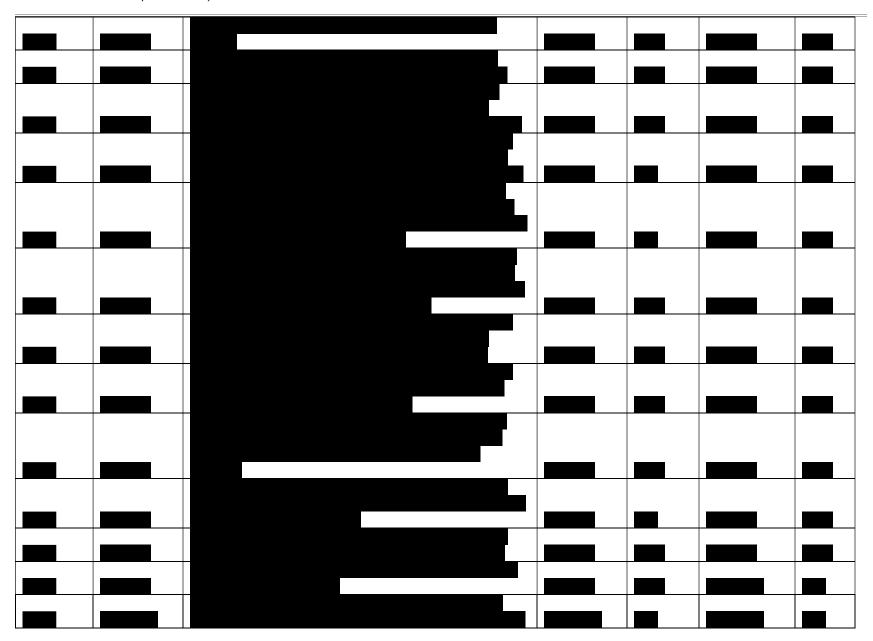




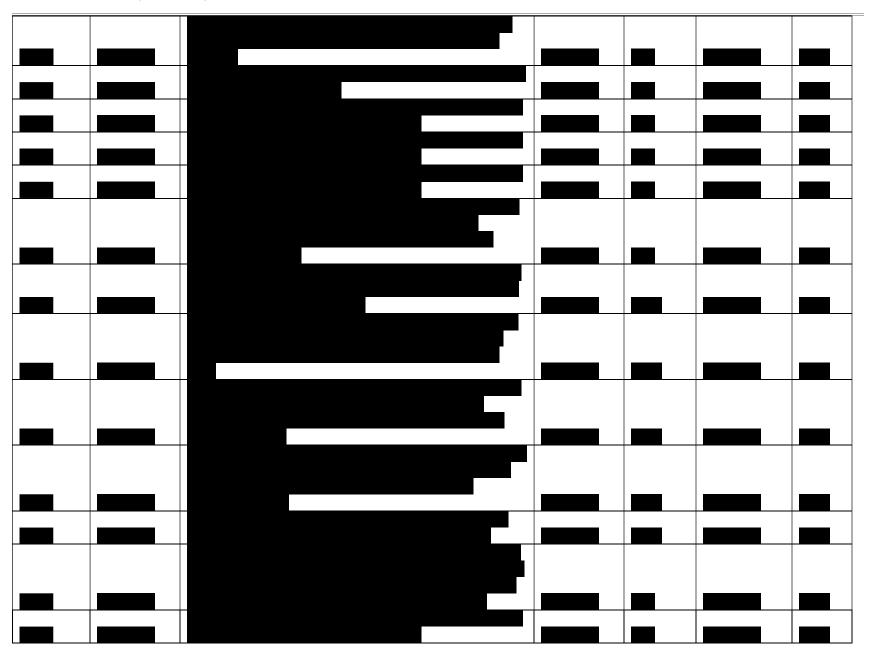








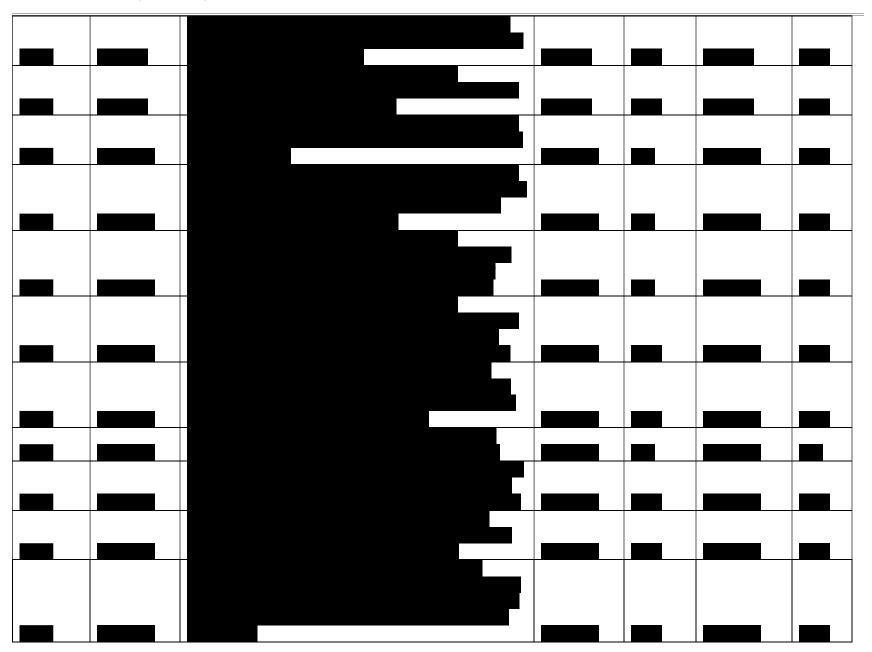












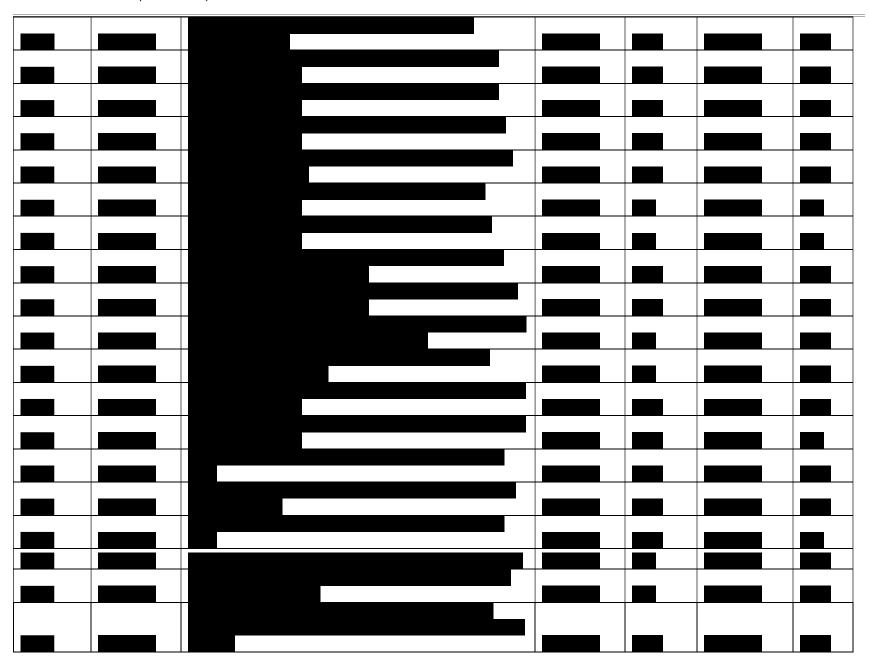








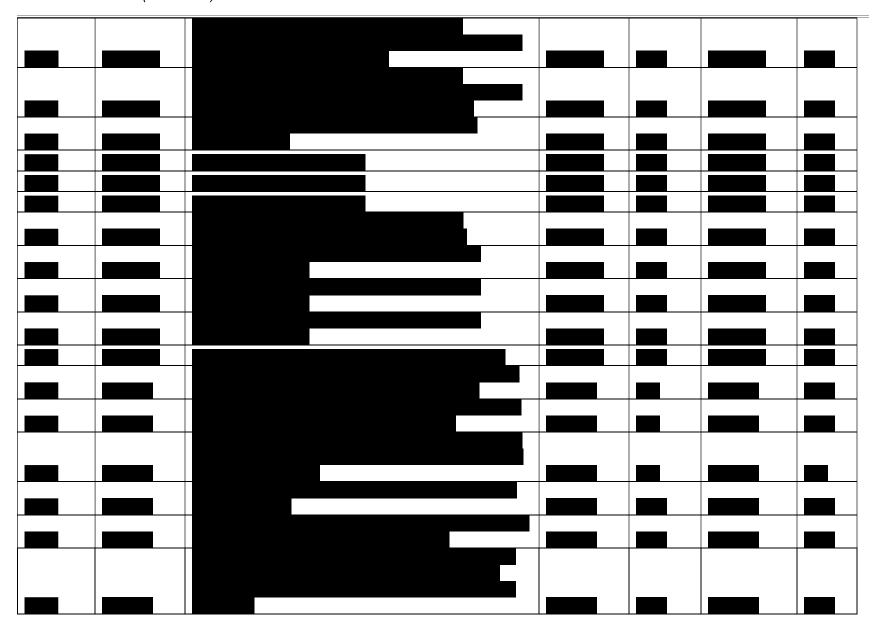


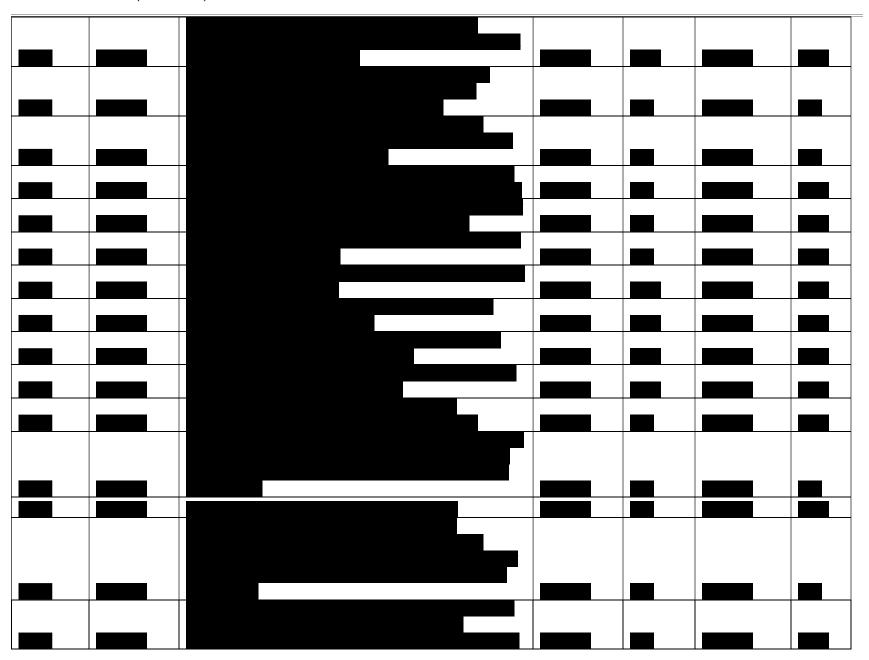


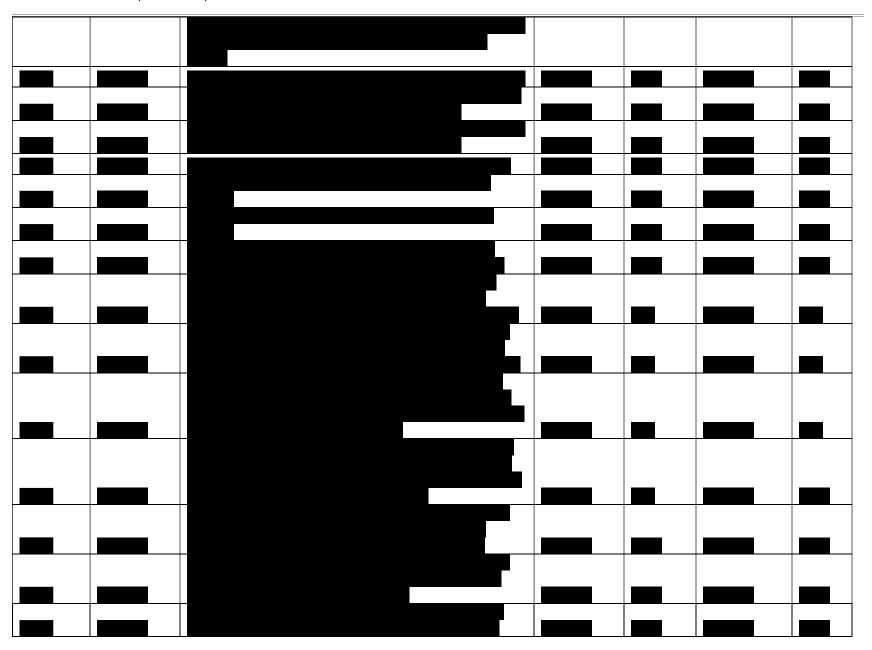


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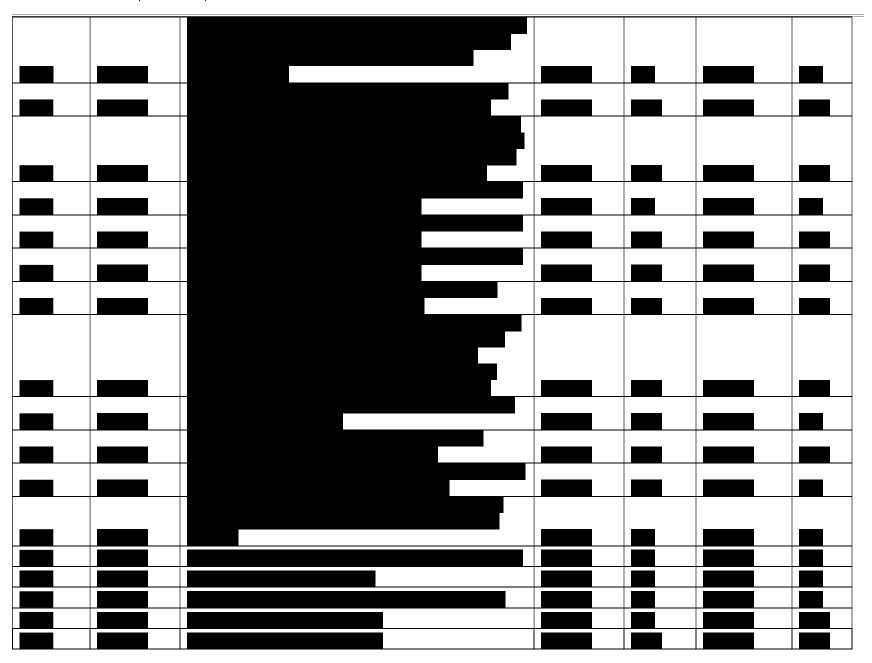


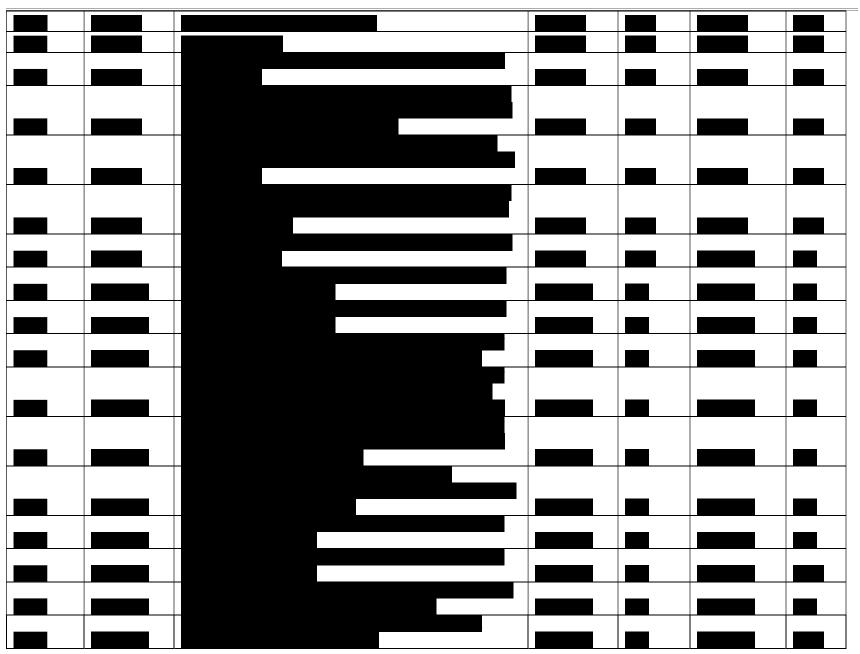




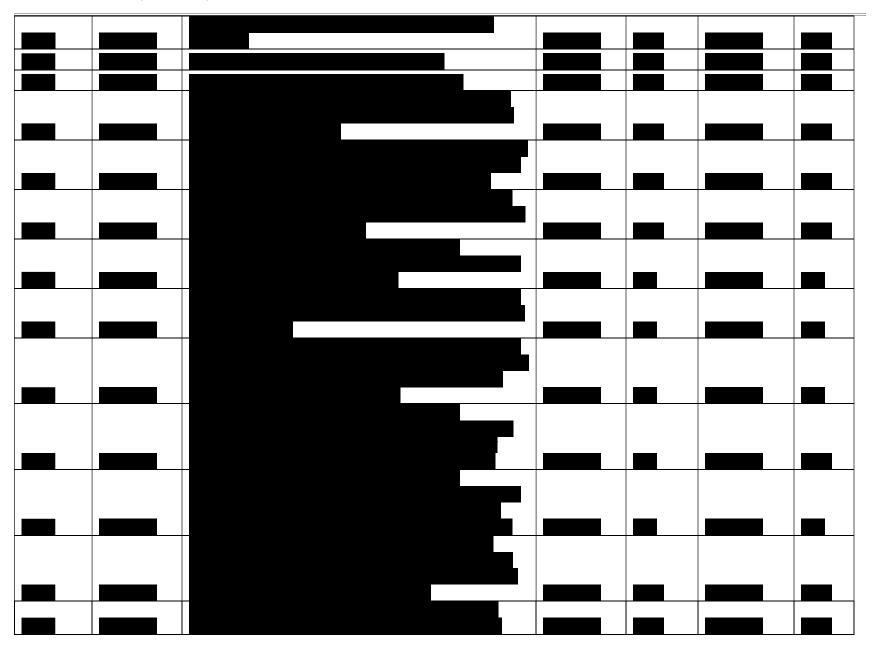


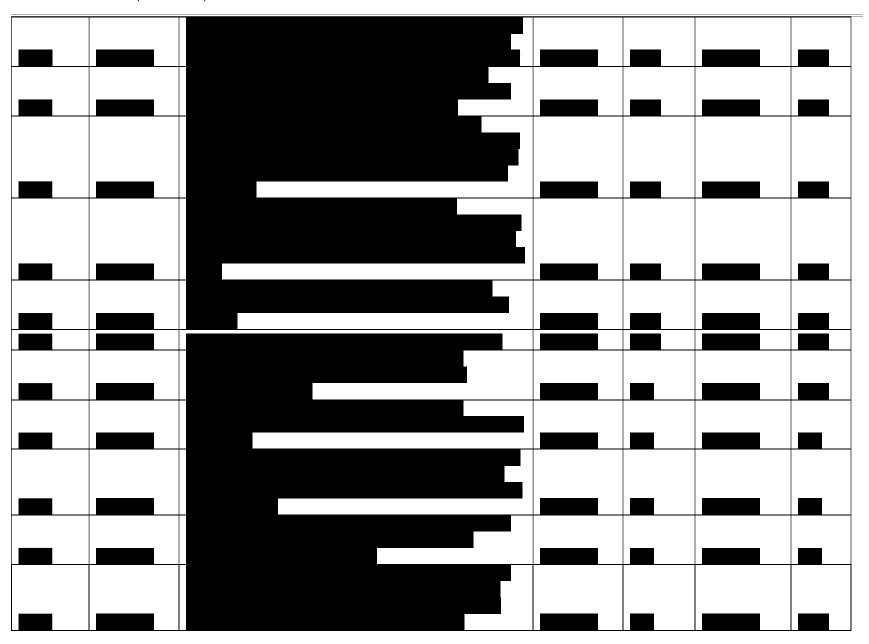










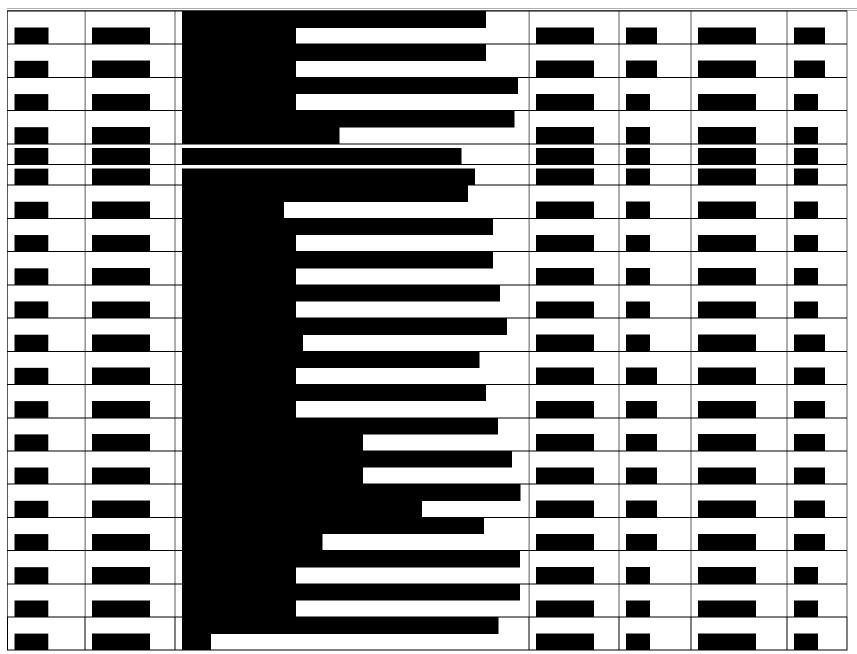


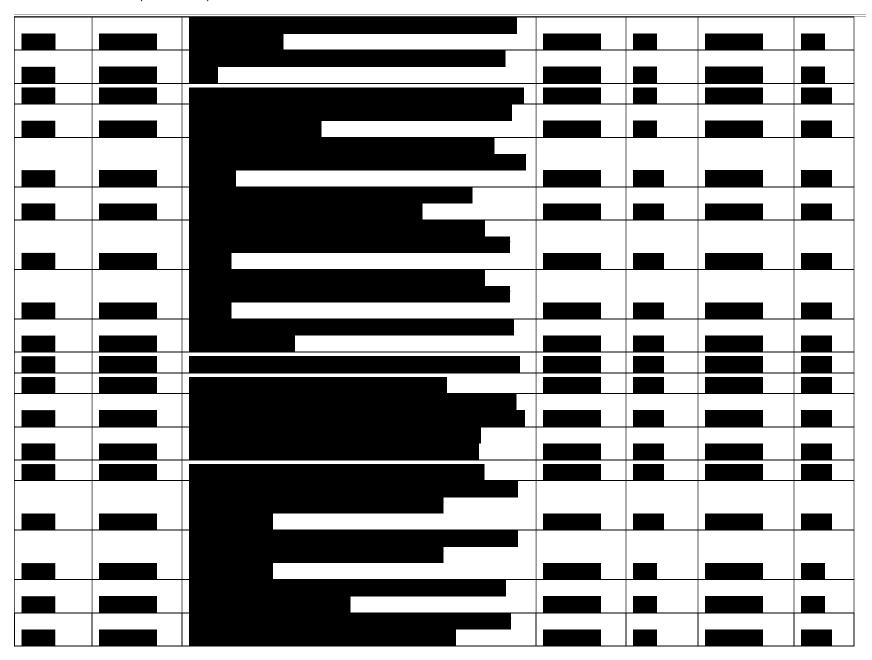






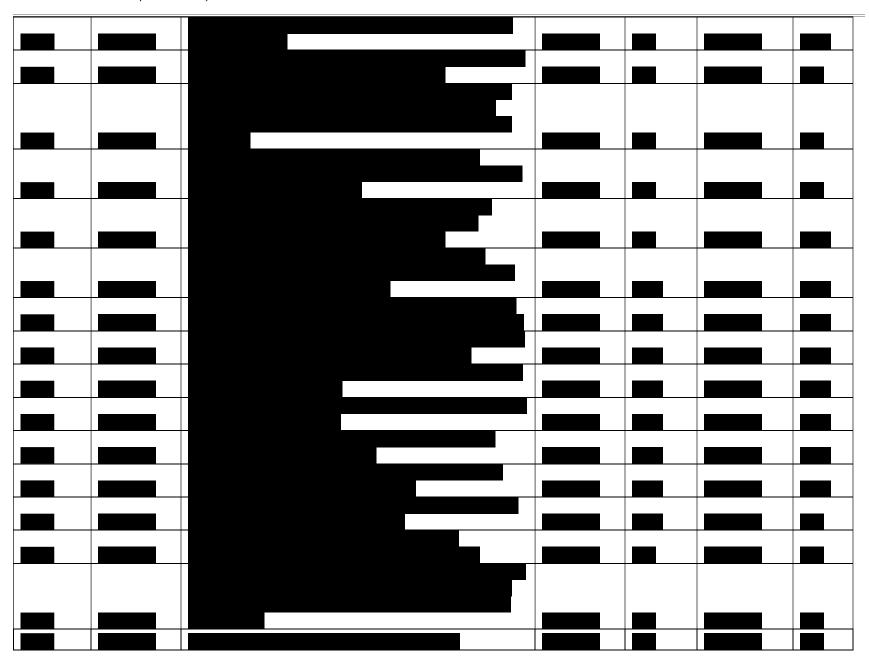




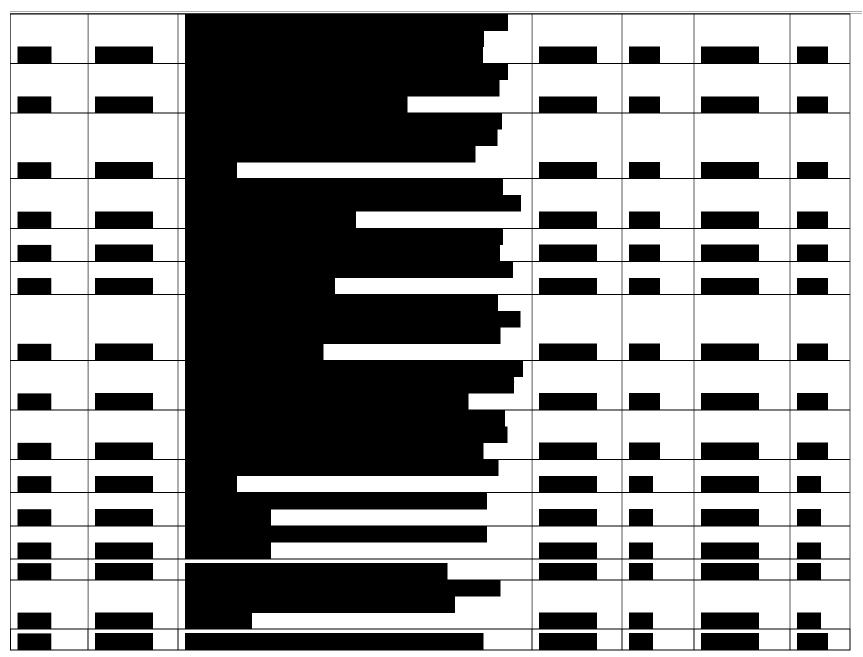










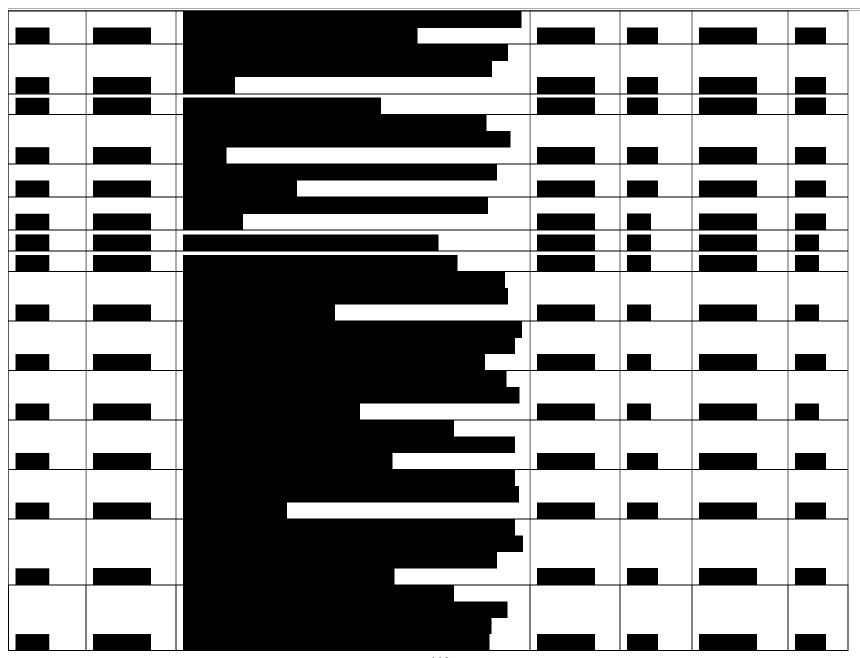












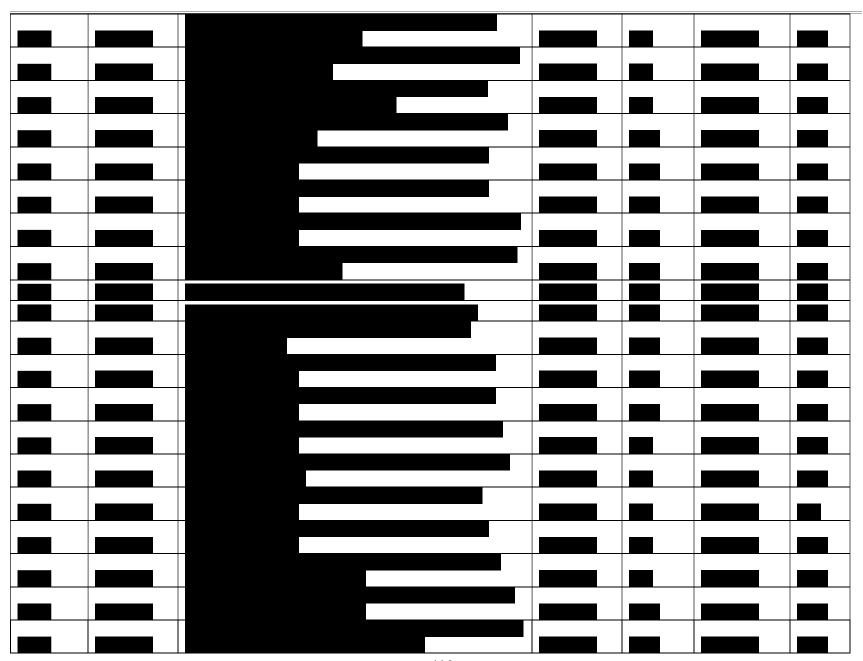




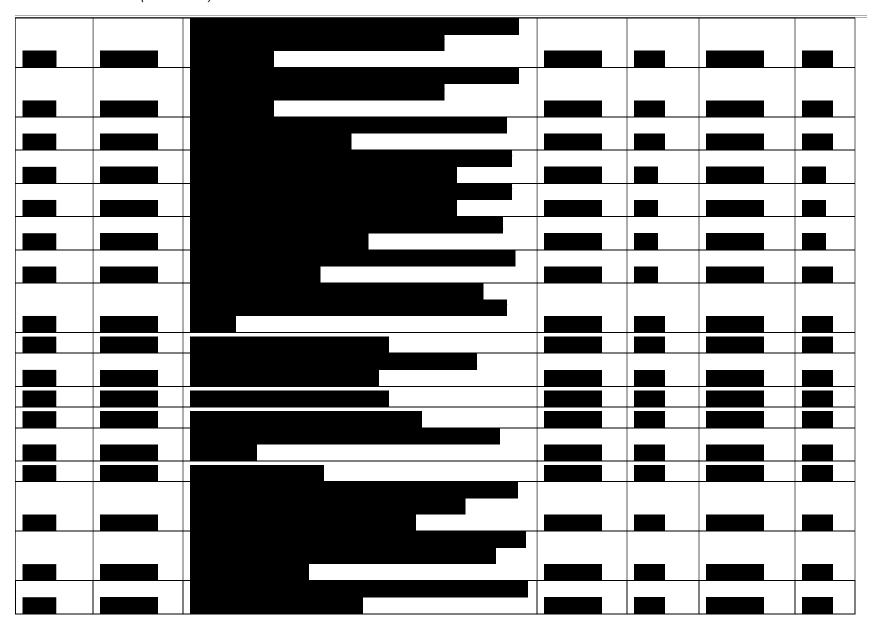


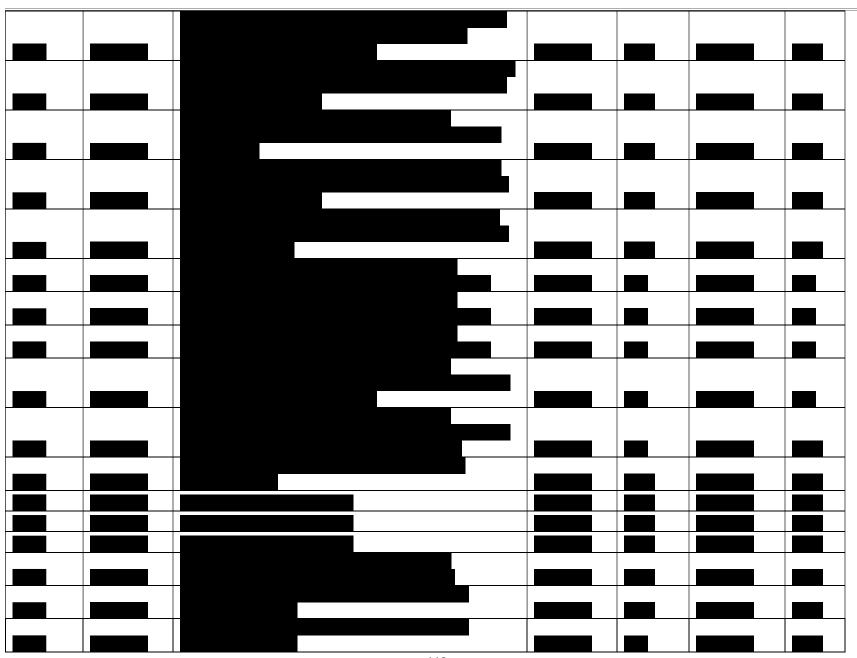






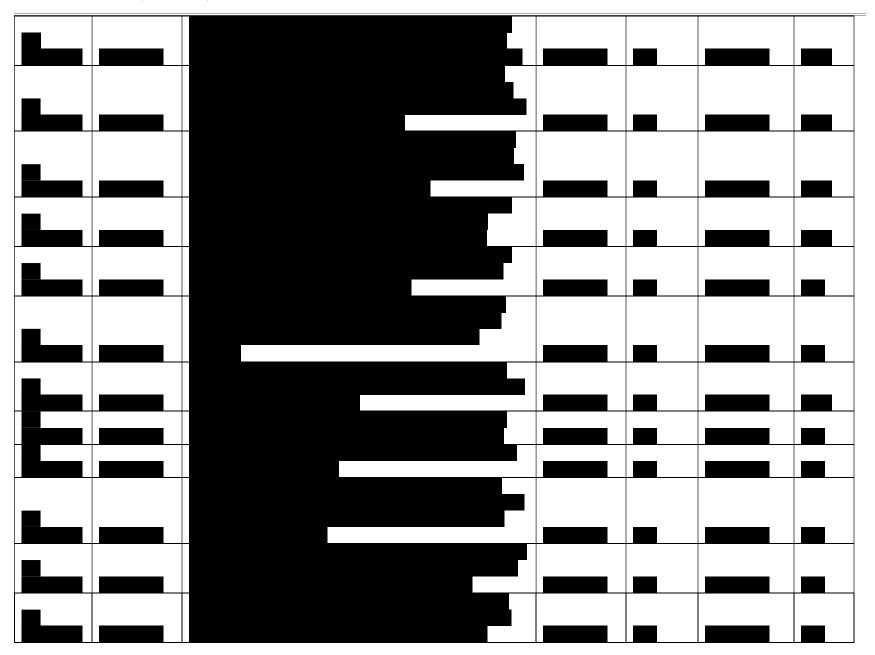


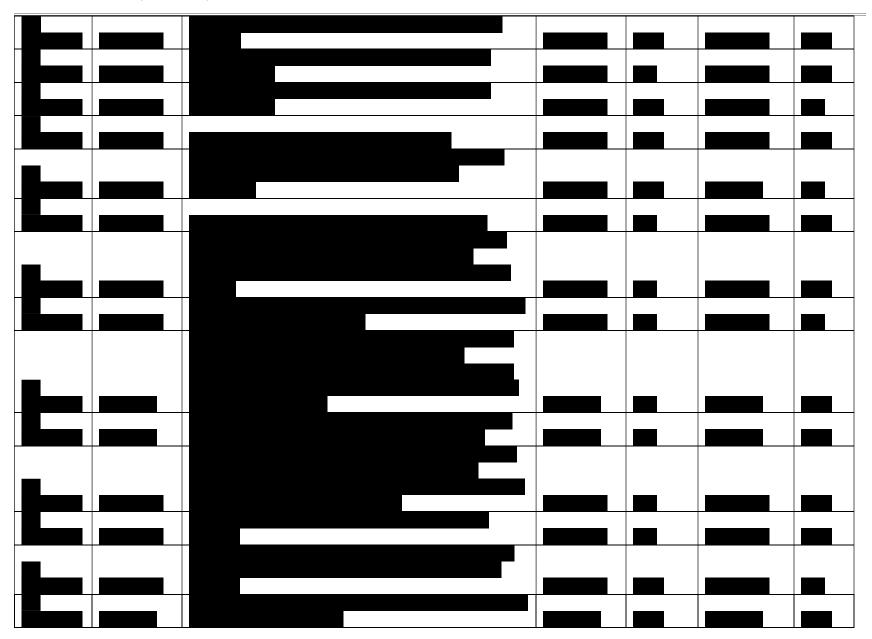


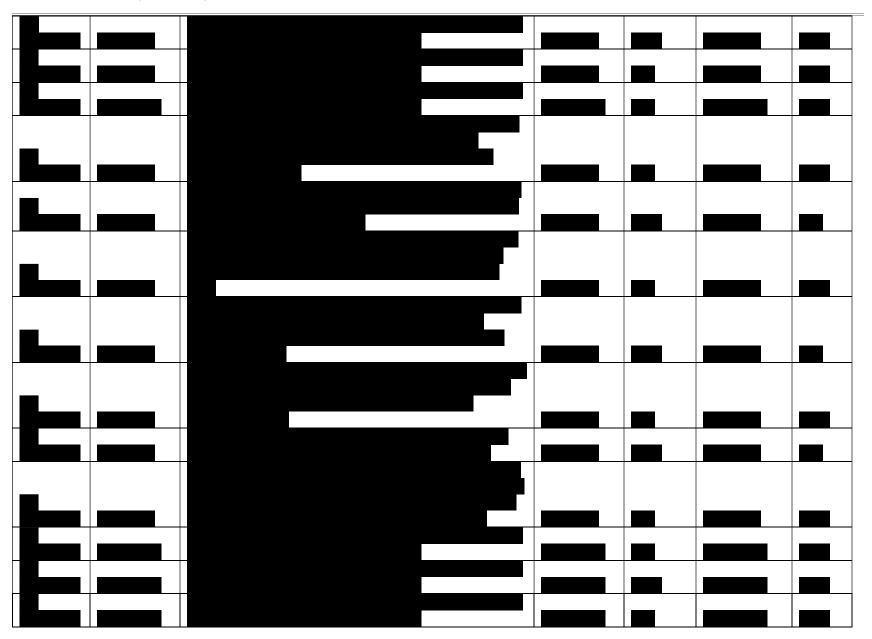












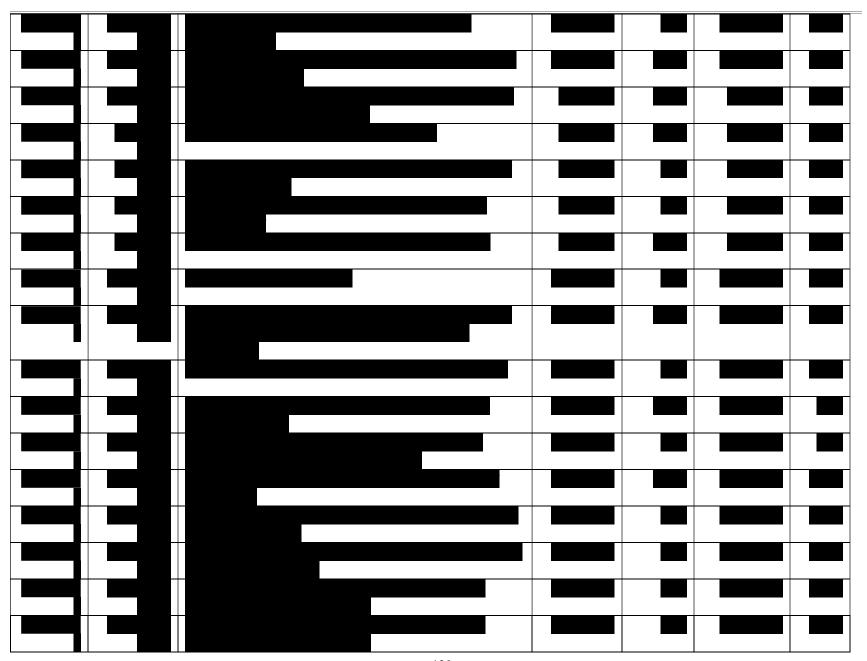


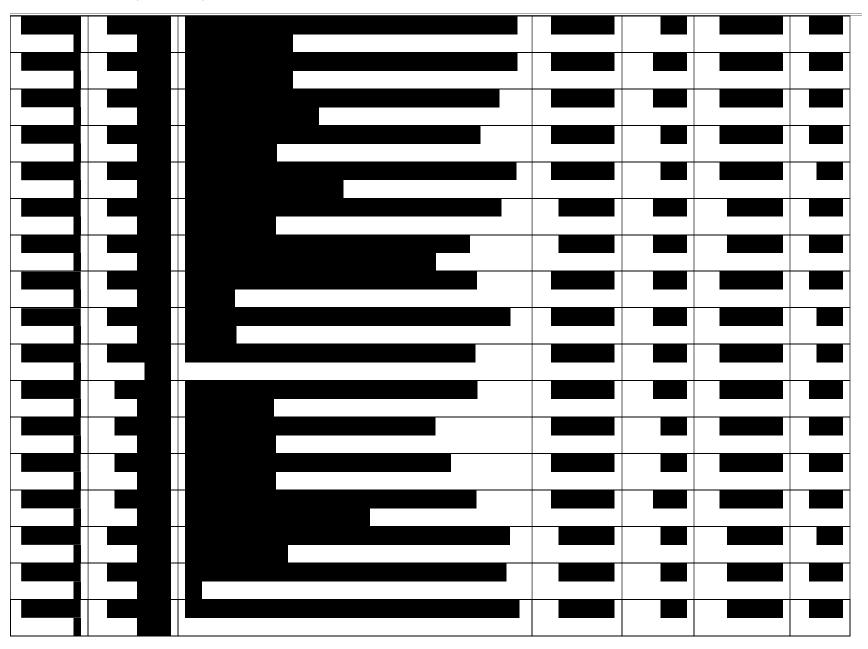




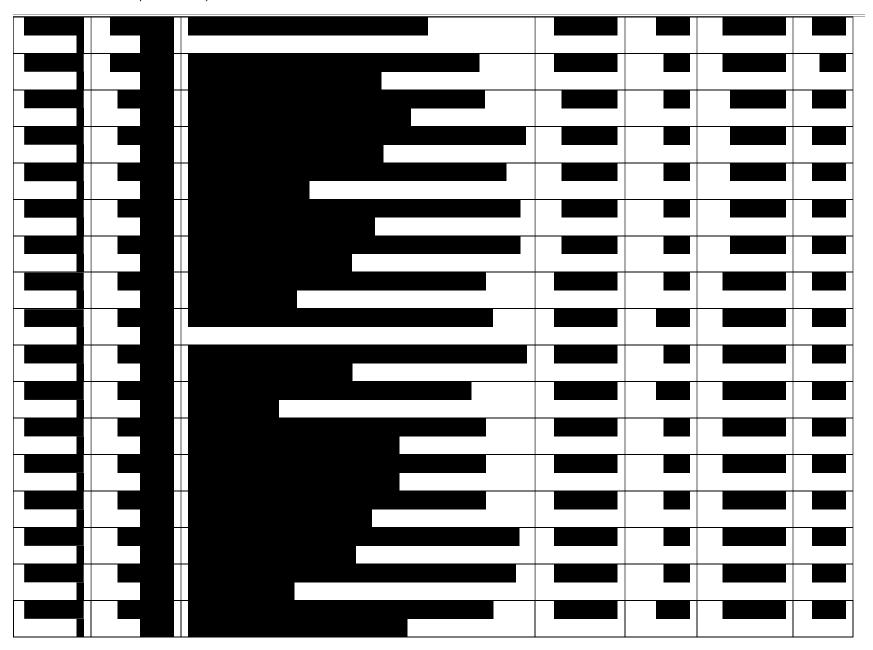


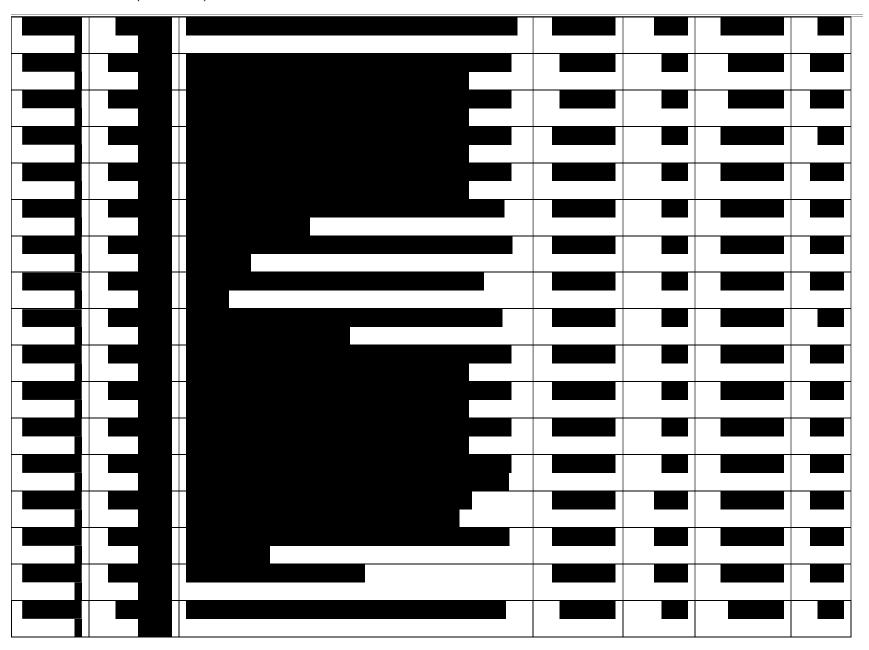


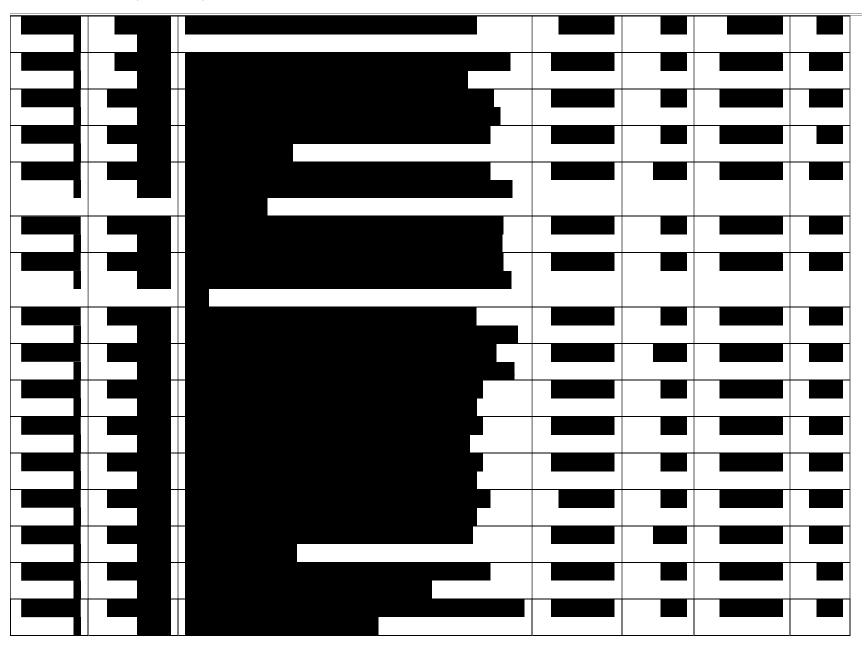




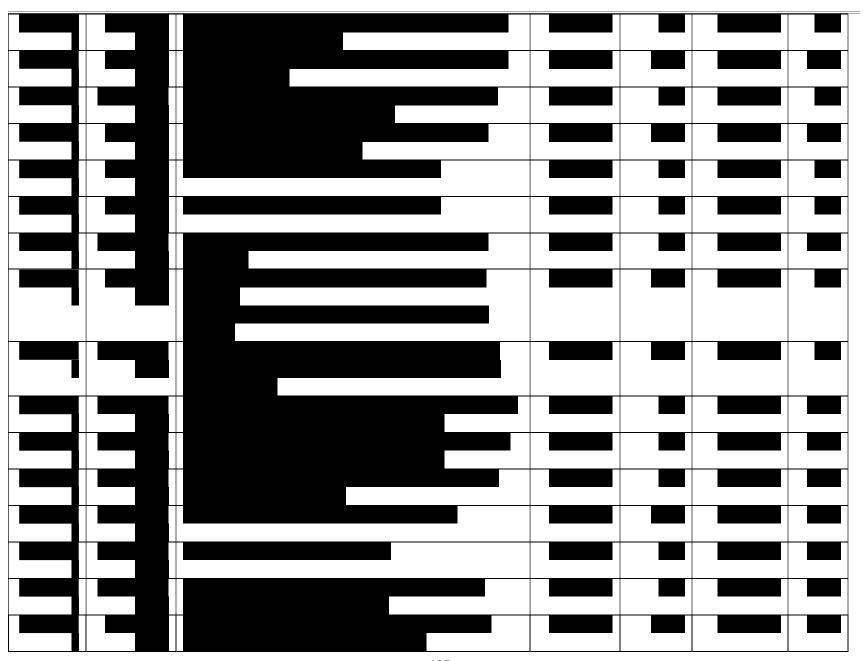


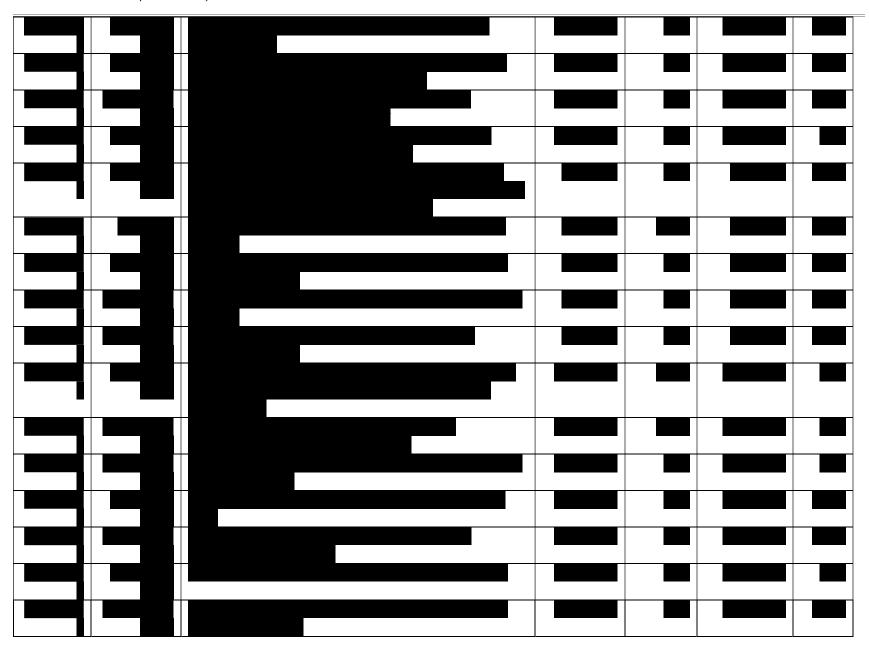


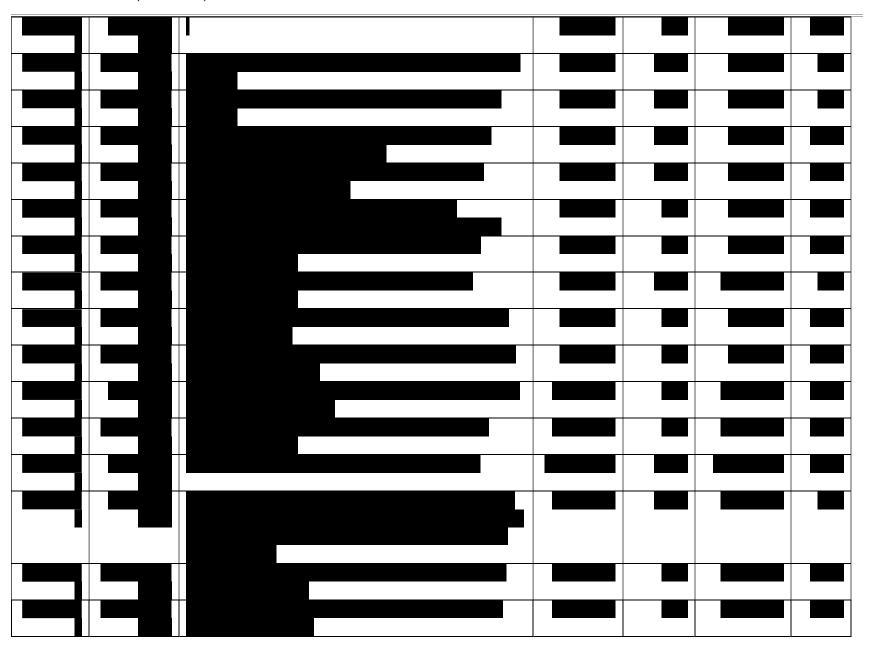


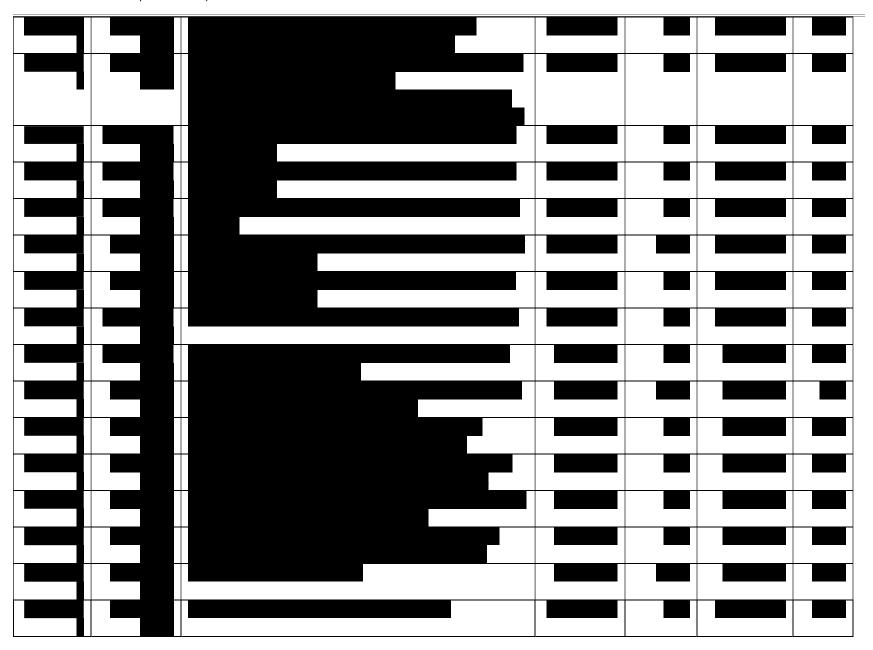




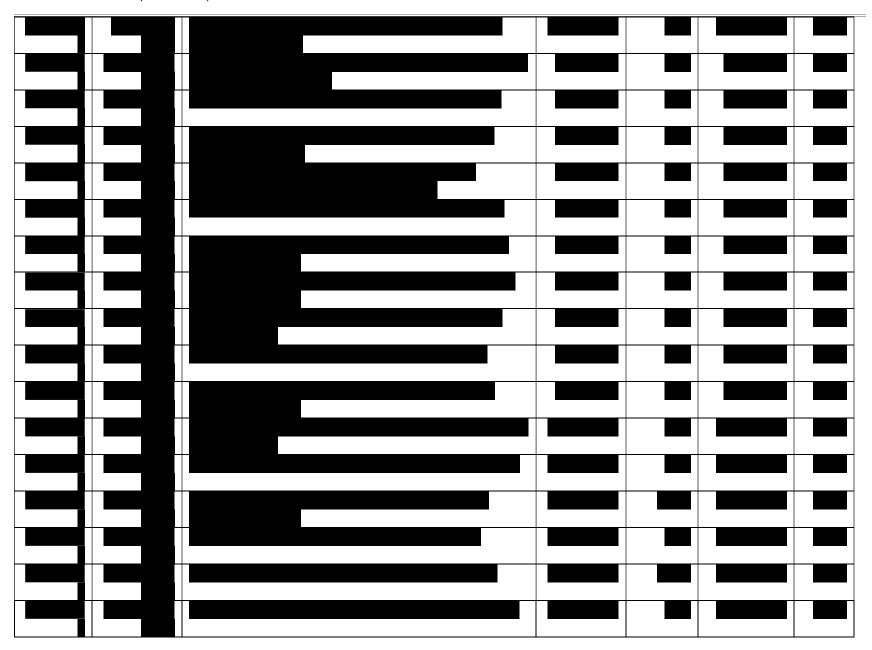


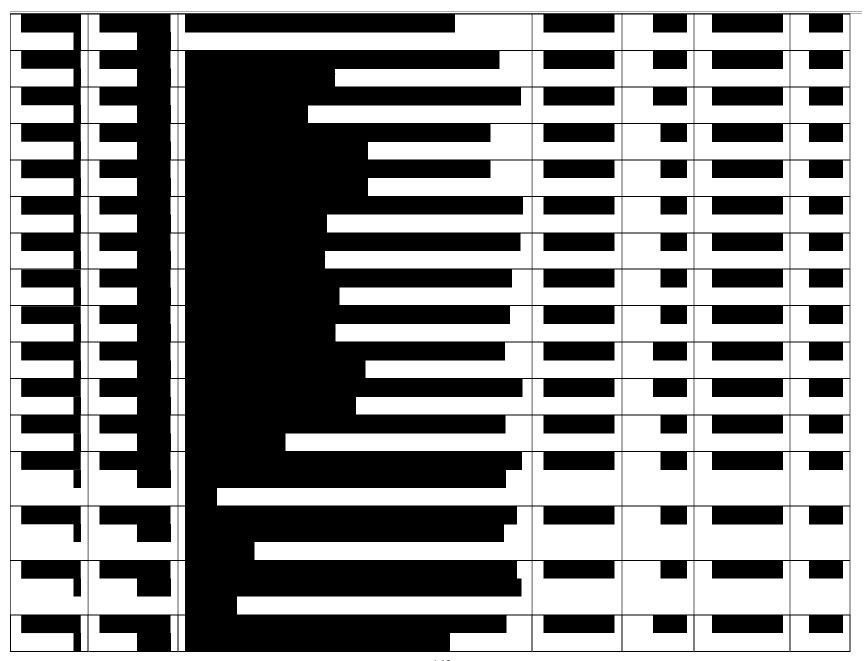


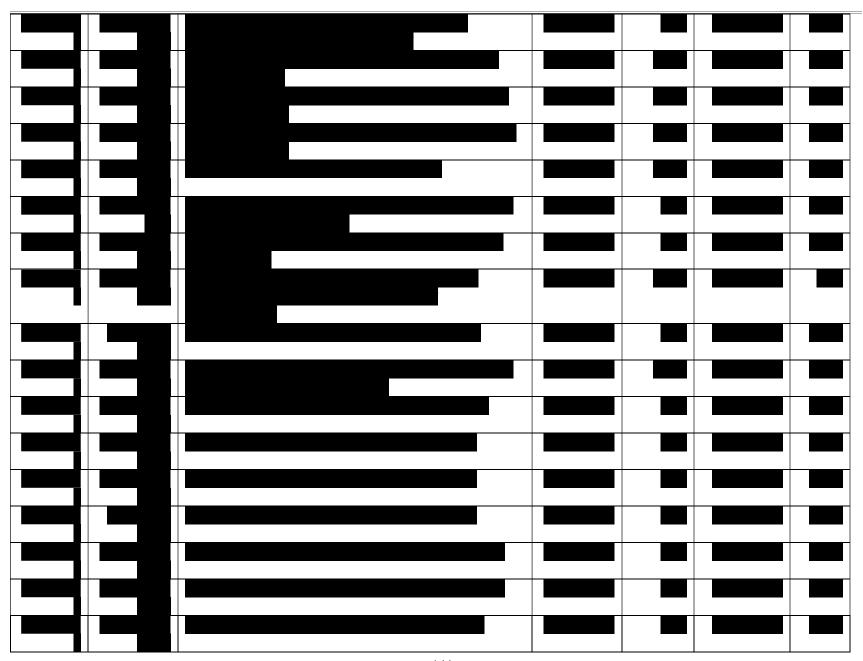














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