## Simplifying, Regularizing and Strengthening Sum-Product Network Structure Learning: Supplementary Material

Antonio Vergari and Nicola Di Mauro and Floriana Esposito

University of Bari "Aldo Moro", Bari, Italy {antonio.vergari,nicola.dimauro,floriana.esposito}@uniba.it

## **Extended Results**

	NLTCS	MSNBC	KDDCup2k	Plants	Audio	Jester	Netflix	Accidents	Retail	Pumsb-star	DNA	Kosarek	MSWeb	Book	$\mathbf{EachMovie}$	WebKB	Reuters-52	BBC	Ad
LearnSPN																			
ho	15	10	15	5	5	15	10	10	15	20	15	15	15	15	10	15	10	10	5
$\lambda$	0.4	0.4	0.2	0.4	0.6	0.6	0.6	0.4	0.2	0.6	0.6	0.6	0.4	0.4	0.8	0.6	0.4	0.6	0.8
m	50	100	10	10	100	100	50	10	50	10	100	10	500	100	100	10	50	10	10
$\alpha$	0.5	0.1	0.5	0.2	2.0	1.0	2.0	0.2	2.0	0.1	0.1	0.5	0.5	1.0	1.0	0.5	0.2	0.1	0.1
SPN-B																			
ho	5	5	5	5	5	5	5	10	10	10	15	5	5	5	5	5	5	5	5
m	10	50	10	10	50	10	50	10	50	10	50	10	10	50	10	10	10	10	10
$\alpha$	2.0	1.0	2.0	1.0	2.0	2.0	2.0	0.2	2.0	0.1	0.1	2.0	1.0	2.0	2.0	2.0	1.0	1.0	0.1
SPN-BT																			
$\rho$	5	5	5	5	5	5	5	10	10	10	10	10	5	10	5	10	5	5	5
m	10	50	10	100	500	50	500	100	50	100	100	500	50	10	10	100	10	10	10
$\alpha$	2.0	1.0	2.0	1.0	2.0	2.0	2.0	0.2	2.0	0.1	0.1	2.0	0.5	2.0	2.0	2.0	1.0	1.0	0.1
MT																			
k	20	30	20	30	22	16	30	30	4	26	6	6	10	4	6	2	4	2	2

Table 1: Best parameter configurations on each dataset, found on the validation set portion for LearnSPN, SPN-B, SPN-BT and MT.

	LearnSPN	SPN-B	SPN-BT	ID-SPN	SPN-BB	SPN-BTB	MT
NLTCS	183	114	108	310	1004	1041	290
MSNBC	7354	5922	5774	46266	7963	8275	8645
KDDCup2k	5800	3946	4525	32067	10633	12148	39857
Plants	1156	1420	276	18833	7515	3023	7414
Audio	1146	1561	131	21009	10466	4113	6566
Jester	1289	789	687	10412	17753	8566	3064
Netflix	1331	2369	152	30294	14871	4768	11402
Accidents	839	1006	722	15472	9198	8280	14073
Retail	253	173	161	4041	2317	2505	320
Pumsb-star	230	1010	612	20952	7819	7790	18533
$\mathbf{DNA}$	140	87	122	3040	2022	3049	228
Kosarek	225	1515	416	17799	16583	3642	18782
$\mathbf{MSWeb}$	369	1711	1444	19682	16881	18273	36076
$\mathbf{Book}$	457	832	389	61248	27473	16630	5918
EachMovie	307	939	946	118782	22506	29355	12100
$\mathbf{WebKB}$	307	1960	490	45451	29265	34952	931
Reuters-52	2538	5256	4333	70864	36109	135970	15082
BBC	1136	2645	2479	61471	56271	121007	1324
$\mathbf{Ad}$	668	1585	1356	87522	72632	58777	6850

Table 2: Times (in seconds) taken to learn the best models on each dataset for LearnSPN, SPN-B, SPN-BT, SPN-BB, SPN-BTB and MT and with default parameters values for ID-SPN. Experiments run on a 4-core Intel Xeon E312xx (Sandy Bridge) @2.0 GHz with 8Gb of RAM and Ubuntu 14.04.1, kernel 3.13.0-39.

Dumb-star         1.56e-09         1.16e-12         9.39e-24         4.31e-15         1.56e-18         1.56e-05         3.91e-31           NA         1.80e-24         2.29e-22         2.20e-26         2.30e-40         2.42e-08         4.69e-20         9.81e-01           Kosarek         3.13e-01         3.05e-01         2.14e-01         2.74e-01         1.89e-01         1.31e-01         2.85e-18           MSWeb         3.83e-02         3.77e-02         1.40e-02         1.84e-03         6.02e-04         6.00e-02         1.30e-06           BehMore         7.36e-01         5.78e-01         5.79e-01         5.58e-01         5.94e-01         1.16e-01           BehMorb         7.59e-01         2.37e-01         2.50e-01         8.98e-02         9.99e-01         1.16e-01           BBC         6.61e-01         7.65e-01         4.79e-01         6.57e-03         4.35e-02         7.29e-03         1.71e-02         2.61e-01           Ad         1.71e-06         3.65e-07         5.30e-01         8.79h-B         SPN-BT								
MSNBC   1.86e-05   1.82e-05   1.24e-05   8.87e-06   1.26e-05   1.49e-04   0.00e-100   0								
MSNBC   1.86e-05   1.82e-05   1.24e-05   8.87e-06   1.26e-05   1.49e-04   0.00e-100   0	NIECC							
Non-Polants   0.00e+00   0.00e+00   0.00e+00   0.00e+00   0.00e+00   0.00e+00   1.60e+01   1.60e+01   1.60e+01   1.30e+01   1.30e+								
Name								
Netflix								
Netflix								
Accidentes								
Name								
Dumb-star         1.56e-09         1.16e-12         9.39e-24         4.31e-15         1.56e-18         1.56e-05         3.91e-31           Kosarek         3.13e-01         3.05e-01         2.14e-01         2.74e-01         1.89e-01         1.31e-01         2.85e-18           MSWeb         3.83e-02         3.37e-02         1.40e-02         1.84e-03         6.02e-04         6.00e-02         1.30e-06           Book         7.34e-01         6.39e-01         7.5e-01         5.72e-01         6.00e-02         1.30e-06           BedhMovie         7.89e-01         5.28e-01         2.77e-01         2.50e-01         8.98e-02         9.99e-01         1.16e-01           Reuters-52         2.50e-01         2.37e-01         3.7e-01         6.57e-03         4.35e-02         7.36e-01         7.7e-02           BBC         6.10e-1         7.65e-01         7.59e-01         8.79e-02         4.35e-02         7.2e-02         7.2e-01           MLTCS         2.90e-71         4.19e-80         SPN-B         SPN-B         SPN-B         SPN-BT								
DNA         1.80e-24         2.29e-22         2.20e-26         2.30e-49         2.42e-08         4.69e-20         9.81e-01           MSWeb         3.33e-01         3.05e-01         2.14e-02         1.84e-03         6.02e-04         6.00e-02         1.30e-06           Book         7.34e-01         6.83e-01         5.72e-01         6.39e-01         4.45e-01         7.30e-01         3.72e-03           EachMovie         7.89e-01         7.86e-01         8.72e-01         5.51e-01         5.58e-01         5.94e-01         1.16e-01           WebKB         6.51e-01         2.37e-01         2.20e-01         4.35e-02         9.99e-01         1.44e-09           Betufers-52         2.50e-01         2.37e-01         3.20e-01         4.35e-02         7.90e-03         1.71e-02         2.61e-01           Add         1.71e-06         3.63e-07         5.30e-01         6.75e-03         7.90e-03         1.71e-02         2.61e-03           MSDRD         SPN-BB         SPN-BB         SPN-BB         SPN-BT	Retail	3.38e-01		1.03e-01		1.51e-01	7.65e-02	4.03e-145
Kosnek         3.13e-01         3.05e-01         2.14e-01         2.74e-01         1.89e-01         1.31e-01         2.85e-18           Book         7.34e-01         6.83e-02         1.40e-02         1.84e-03         6.02e-04         6.0e-02         1.30e-06           Book         7.34e-01         6.83e-01         5.72e-01         6.39e-01         4.45e-01         7.30e-01         1.72e-03           KehKB         6.51e-01         5.23e-01         2.77e-01         2.50e-01         8.98e-02         9.99e-01         1.16e-01           BC         6.61e-01         7.65e-01         4.79e-01         6.57e-03         7.90e-03         1.71e-02         6.61e-01           Add         1.71e-06         3.63e-07         5.30e-01         8.78e-18         PN-B         SPN-B         S	Pumsb-star	1.55e-09	1.16e-12	9.39e-24	4.31e-15	1.54e-18	1.56e-05	3.91e-31
MSWeb         3.88-0.2         3.37-0.2         1.40-0.2         1.84-0.3         6.02-0.4         6.00-0.2         1.30-0.6           BachMovie         7.34-0.1         6.83-0.1         5.72-0.1         5.51-0.1         5.58-0.1         5.94-0.1         1.16-0.1           WebKB         6.51-0.1         5.23-0.1         2.77-0.1         2.50-0.1         8.98-0.2         9.99-0.1         1.46-0.9           BC         2.50-0.1         2.37-0.1         3.20-0.1         4.35-0.0         4.35-0.2         2.99-0.1         1.44-0.9           BC         6.61-0.1         7.65-0.1         4.79-0.1         6.57-0.3         7.90-0.3         1.71-0.2         2.61-0.1           Add         1.71-0.6         3.63-0.7         5.30-0.1         8.78-0.3         7.90-0.3         1.71-0.2         2.61-0.1           MCT         SPN-B         SPN-BB         SPN-BB         SPN-BT		1.80e-24	2.29e-22	2.20e-26	2.30e-49	2.42e-08	4.69e-20	
Book         7.34e-01         6.83e-01         5.72e-01         6.39e-01         4.5e-01         5.94e-01         1.76e-01           WebKB         6.51e-01         5.23e-01         2.77e-01         2.51e-01         5.58e-01         5.94e-01         1.1de-01           WebKB         6.51e-01         5.23e-01         2.77e-01         2.50e-01         8.98e-02         9.99e-01         1.4de-09           BeU         6.61e-01         7.65e-01         4.79e-01         6.57e-03         7.90e-03         7.72e-01         2.72e-01         3.72e-03         7.72e-01         2.72e-01         4.75e-02         2.72e-01         3.72e-03         3.72e-03         3.72e-03         3.72e-03         3.72e-03         4.79e-01         6.57e-03         7.90e-03         7.2e-01         3.72e-03         3.72e-0		3.13e-01	3.05e-01	2.14e-01	2.74e-01	1.89e-01		
BachMovie         7.89e-01         7.86e-01         8.73e-01         5.16e-01         5.94e-01         1.16e-01           WebKB         6.51e-01         5.23e-01         2.77e-01         2.50e-01         8.98e-02         9.99e-01         1.44e-09           BBC         6.61e-01         7.65e-01         4.79e-01         6.57e-03         7.90e-03         7.17e-02         2.61e-03           Ad         1.71e-06         3.63e-07         5.30e-01         8.78e-01         7.90e-03         7.17e-02         2.61e-03           MC         3.70e-01         8.78e-01	MSWeb	3.83e-02	3.37e-02	1.40e-02	1.84e-03	6.02e-04	6.00e-02	1.30e-06
WebKB Reuters-52         6.51e-01         2.32e-01         2.77e-01         2.50e-01         8.98e-02         9.99e-01         1.44e-09           BBC         6.61e-01         7.65e-01         4.79e-01         6.57e-03         7.90e-03         1.71e-06         2.61e-01           Ad         1.71e-06         3.63e-07         5.30e-01         8.73e-14         2.12e-14         7.86e-06         6.21e-03           RD         SPN-B         SPN-B         SPN-B         SPN-B         SPN-B         SPN-BT         SPN-BT <th>Book</th> <th>7.34e-01</th> <th>6.83e-01</th> <th>5.72e-01</th> <th>6.39e-01</th> <th>4.45e-01</th> <th>7.30e-01</th> <th>3.72e-03</th>	Book	7.34e-01	6.83e-01	5.72e-01	6.39e-01	4.45e-01	7.30e-01	3.72e-03
Reuters-52         2, 50e-01         2, 37e-01         3, 20e-01         4, 35e-02         4, 35e-02         7, 23e-01         3, 77e-01         2, 20e-01         4, 35e-02         7, 20e-03         1, 71e-02         2, 21e-01           Ad         1, 71e-06         3, 63e-07         5, 30e-01         8, 73e-14         2, 12e-14         7, 86e-06         6, 21e-03           Ruccolom         SPN-B         SPN-B         SPN-B         SPN-B         SPN-B         SPN-B         SPN-BT         Ade-22           KDDCUPAL         0.00e-400         0.00e-400 <th>EachMovie</th> <th>7.89e-01</th> <th>7.86e-01</th> <th>8.73e-01</th> <th>5.51e-01</th> <th>5.58e-01</th> <th>5.94e-01</th> <th>1.16e-01</th>	EachMovie	7.89e-01	7.86e-01	8.73e-01	5.51e-01	5.58e-01	5.94e-01	1.16e-01
BBC         6,61e-01         7,65e-01         4,79e-01         6,57e-03         7,90e-03         1,71e-02         2,61e-01           Ad         1,71e-06         3,63e-07         5,30e-01         8,73e-14         2,12e-14         7,86e-06         6,21e-03           SPN-B         SPN-B         SPN-B         SPN-B         SPN-BT         SPN-BT         SPN-BT         SPN-BT           NLTCS         2,01e-08         3,00e-11         2,94e-11         4,30e-11         1,98e-08         1,44e-23         1,37e-23           MSNBC         2,96e-71         4,11e-28         8,77e-22         6,59e-34         1,40e-71         2,08e-27         3,40e-22           KDDCupta         0,00e+00	WebKB	6.51e-01	5.23e-01	2.77e-01	2.50e-01	8.98e-02	9.99e-01	1.44e-09
Add         1.71e-06         3.63e-07         5.30e-01         8.73e-14         2.12e-14         7.86e-06         6.21e-03           Record (A)         SPN.B         SPN.B         SPN.B         SPN.B         SPN.BT         SPN.BT         SPN.BT         SPN.BT         SPN.BT         SPN.BT         SPN.BTB         SPN.BTB           NLTCS         2.01e-08         3.00e-11         2.94e-11         4.30e-11         1.98e-08         1.44e-23         1.37e-23           MSNBC         2.90e-71         4.11e-28         8.77e-22         6.59e-34         1.40e-71         2.08e-27         3.40e-22           KDDCup2k         0.00e+00         0.00e+00         0.00e+00         0.00e+00         0.00e+00         0.00e+00           Plants         8.90e-12         7.30e-102         2.74e-126         4.52e-08         3.27e-03         9.16e-60         6.83e-95           Audio         3.19e-61         6.61e-102         7.40e-04         4.72e-35         5.42e-73         1.42e-110         1.12e-03           Metail         4.53e-14         3.15e-102         3.74e-11         1.66e-279         1.75e-61         7.79e-93           Retail         7.23e-01         9.1e-25         7.4ee<0	Reuters-52	2.50e-01	2.37e-01	3.20e-01	4.35e-02	4.35e-02	7.23e-01	3.77e-01
NLTCS	BBC	6.61e-01	7.65e-01	4.79e-01	6.57e-03	7.90e-03	1.71e-02	2.61e-01
NLTCS	$\mathbf{Ad}$	1.71e-06	3.63e-07	5.30e-01	8.73e-14	2.12e-14	7.86e-06	6.21e-03
NLTCS								
MSNBC         2.96e-71         4.11e-28         8.77e-22         6.59e-34         1.40e-71         2.08e-27         3.40e-22           KDDCup2k         0.00e+00         0.06e-05         4.32e-03         1.76e-61         4.83e-120         4.47e-200         4.72e-35         5.42e-73         1.74e-118         2.47e-200           Methix         4.53e-143         1.17e-03         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-99           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-03         1.18e-58         1.54e-06           MSWeb         5.82e-07 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th>SPN-BTB</th>								SPN-BTB
MSNBC         2.96e-71         4.11e-28         8.77e-22         6.59e-34         1.40e-71         2.08e-27         3.40e-22           KDDCup2k         0.00e+00         0.06e-05         4.32e-03         1.76e-61         4.83e-120         4.47e-200         4.72e-35         5.42e-73         1.74e-118         2.47e-200           Methix         4.53e-143         1.17e-03         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-99           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-03         1.18e-58         1.54e-06           MSWeb         5.82e-07 <th>NLTCS</th> <th>2.01e-08</th> <th>3.00e-11</th> <th>2.94e-11</th> <th>4.30e-11</th> <th>1.98e-08</th> <th>1.44e-23</th> <th>1.37e-23</th>	NLTCS	2.01e-08	3.00e-11	2.94e-11	4.30e-11	1.98e-08	1.44e-23	1.37e-23
KDDCup2k         0.00e+00         6.83e-95           Audio         3.19e-61         6.37e-181         5.98e-199         6.08e-25         5.2e-53         1.74e-118         2.47e-200           Jester         1.22e-69         1.61e-102         7.40e-04         4.72e-35         5.42e-73         1.42e-110         1.12e-03           Netflix         4.53e-143         1.17e-203         6.19e-252         1.28e-82         6.20e-114         6.75e-92         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-29           Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.59e-30         8.50e-33         1.91e-01         6.39e-29           DNA         2.38e-10         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-51 <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>								
Plants         8.90e-12         7.30e-102         2.74e-126         4.52e-08         3.27e-03         9.16e-60         6.83e-95           Audio         3.19e-61         6.37e-181         5.98e-199         6.08e-25         1.52e-53         1.74e-118         2.47e-200           Jester         1.2e-69         1.61e-102         7.40e-04         4.72e-35         5.42e-73         1.42e-110         1.12e-03           Netflix         4.53e-143         1.17e-203         6.19e-252         1.28e-82         6.20e-114         6.75e-92         1.63e-221           Accidents         9.77e-281         2.71e-70         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.59e-30         8.50e-33         1.91e-01         6.39e-09           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.18e-58         1.54e-09           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18								
Audio         3.19e-61         6.37e-181         5.98e-199         6.08e-25         1.52e-53         1.74e-118         2.47e-200           Jester         1.22e-69         1.61e-102         7.40e-04         4.72e-35         5.42e-73         1.42e-110         1.12e-03           Netflix         4.53e-143         1.17e-203         6.19e-252         1.28e-82         6.20e-114         6.75e-92         1.63e-221           Accidents         9.77e-281         2.71e-70         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-29           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.18e-58         1.54e-06           Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-0           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-02         1.25e-03         3.6e-59         5.03e-57         4.68e-01         2.2fe-60         2.6e-60								
Jester         1.22e-69         1.61e-102         7.40e-04         4.72e-35         5.42e-73         1.42e-110         1.12e-03           Netflix         4.53e-143         1.17e-203         6.19e-252         1.28e-82         6.20e-114         6.75e-92         1.63e-221           Accidents         9.7re-281         2.71e-70         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-29           Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.59e-30         8.50e-33         1.91e-01         6.39e-09           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Bok         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.19e-22         9.98e-18           Bok         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.69e-59         5.03e-57         4.68e-01         2.24e-60         2.6e-00      <								
Netflix         4.53e-143         1.17e-203         6.19e-252         1.28e-82         6.20e-114         6.75e-92         1.63e-221           Accidents         9.77e-281         2.71e-70         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-29           Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.59e-30         8.50e-33         1.91e-01         6.39e-09           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.18e-58         1.54e-06           Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55         8.94e-18           EachMovie         4.83e-02         1.23e-27         1.01e-27         3.74e-39         2.33e-02         6.25e-01         2.97e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-15         2.79e-01								
Accidents         9.77e-281         2.71e-70         1.08e-99         3.74e-11         1.66e-279         1.75e-61         7.97e-93           Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-29           Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.59e-30         8.50e-33         1.91e-01         6.39e-09           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.18e-58         1.54e-06           Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           EachMovie         4.85e-09         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.79e-01         4.32e-21      <								
Retail         7.23e-01         9.91e-29         5.60e-29         5.03e-07         6.81e-01         1.01e-28         7.80e-29           Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.59e-30         8.50e-33         1.91e-01         6.39e-09           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.8e-58         1.54e-06           Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BC         NT         ID-SPN         ID-SPN         BN-BB         SPN-BB         SPN-BB         SPN-BB         SPN-BB         MT								
Pumsb-star         1.85e-56         1.30e-10         4.19e-35         1.5e-30         8.50e-33         1.91e-01         6.39e-09           DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.18e-58         1.54e-06           Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           EachMovie         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BC         5.99e-01         4.63e-60         3.6e-25         2.71e-01         4.33e-27         1.0r-24           Ad         8.61e-37         4.8e-37         1.8re-40         1.35e-01         1.31e-40         5.23e-30         1.0le-35           MT         SPN-BB								
DNA         2.15e-01         2.72e-55         7.41e-08         2.46e-104         2.05e-02         1.18e-58         1.54e-06           Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           EachMovie         4.83e-02         1.23e-22         1.01e-17         9.30e-31         4.39e-02         1.97e-22         2.98e-18           WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36         Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60         BBC           BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Ad         8.61e-37         4.48e-37         ID-SPN         ID-SPN         SPN-BB         SPN-BB         SPN-BB         MT								
Kosarek         1.38e-17         5.20e-05         5.29e-66         6.13e-02         4.28e-18         2.07e-11         1.11e-40           MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           EachMovie         4.83e-02         1.23e-22         1.01e-17         9.30e-31         4.39e-02         1.97e-22         2.98e-18           WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Add         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           NLTCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03								
MSWeb         5.82e-07         5.48e-31         8.98e-108         4.14e-19         3.51e-10         2.48e-08         3.48e-55           Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           EachMovie         4.85e-29         1.23e-22         1.01e-17         9.30e-31         4.39e-02         1.97e-22         2.98e-18           WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           MT         SPN-BB         BD-SPN         BMT         SPN-BB         SPN-BB         SPN-BB         MT           MITCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03           MSNBC         1.79								
Book         1.39e-03         2.74e-17         3.74e-39         2.33e-02         6.25e-01         9.31e-25         8.94e-18           EachMovie         4.83e-02         1.23e-22         1.01e-17         9.30e-31         4.39e-02         1.97e-22         2.98e-18           WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.40e-12         2.24e-60         2.68e-60           BC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           NETCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03           MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18           KDDCup2k         0.00e+00         0.00e+00         0.00e+00         0.00e+00         0.00e+00         0.00e+00         0.00e+00         0.00e+00								
EachMovie         4.83e-02         1.23e-22         1.01e-17         9.30e-31         4.39e-02         1.97e-22         2.98e-18           WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.3ae-27         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           MT         SPN-BT         ID-SPN         ID-SPN         SPN-BB         SPN-BB         SPN-BB         SPN-BB         MT         MT           MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18         KDDCup2k         0.00e+00         0.00								
WebKB         4.85e-29         3.31e-11         1.11e-75         2.54e-05         4.40e-12         2.50e-01         2.27e-36           Reuters-52         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           SPN-BT         D-SPN         ID-SPN         SPN-BB         SPN-BB         SPN-BB         SPN-BB         SPN-BB         SPN-BB         SPN-BB         MT         MT         MT         MT           NLTCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03           MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18           KDDCup2k         0.00e+00								
Reuters-52 BBC         5.99e-01         4.63e-60         3.66e-59         5.03e-57         4.68e-01         2.24e-60         2.68e-60           BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           SPN-BT         JPN-BT         JPN-BT         SPN-BB         MT           NLTCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03           MSDCup2k         0.00e+00								
BBC         3.49e-01         8.16e-25         3.95e-22         6.46e-25         2.71e-01         4.33e-27         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.07e-24           Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.07e-24           BC         SPN-BT         ID-SPN         ID-SPN         SPN-BB         SPN-BB         SPN-BB         SPN-BTB         MT           NLTCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03           MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18           KDDCup2k         0.00e+00         0.00e+0								
Ad         8.61e-37         4.48e-37         1.81e-40         1.35e-01         1.31e-40         5.23e-30         1.01e-35           SPN-BT         ID-SPN         ID-SPN         ID-SPN         SPN-BB         MT         MT <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th> <th></th>								
SPN-BT   ID-SPN   ID-SPN   SPN-BB   SPN-BB   SPN-BB   MT   MT   SPN-BB   SPN-BTB   MT   SPN-BTB   MT   SPN-BTB   MT   MT   SPN-BTB   MT   MT   SPN-BTB   MT   MT   MT   MT   MT   MT   MT								
NLTCS         4.39e-11         6.25e-03         6.25e-03         2.58e-03         4.27e-97         7.40e-03         7.82e-03           MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18           KDDCup2k         0.00e+00	Ad	8.61e-37	4.48e-37	1.81e-40	1.35e-01	1.31e-40	5.23e-30	1.01e-35
MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18           KDDCup2k         0.00e+00         0.00e								SPN-BTB MT
MSNBC         1.79e-34         5.88e-95         5.34e-06         1.45e-36         0.00e+00         3.02e-91         2.07e-18           KDDCup2k         0.00e+00         0.00e		IVII	0 22					
KDDCup2k         0.00e+00         3.0e-03         1.20e-24         3.50e-93         1.05e-123         6.78e-58         0.62e-50         1.16e-06         2.15e-32         6.78e-58         0.62e-57         Netflix         1.39e-53         1.09e-08         4.19e-01         3.62e-20         1.14e-24         1.63e-02         4.88e-22         4.88e-22         Accidents         1.31e-15         3.78e-248         1.75e-226         7.16e-307         6.64e-50         2.12e-112         1.96e-141         Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           D	NLTCS						7 40e-03	7 82e-03
Plants         4.35e-18         6.21e-27         6.83e-49         6.39e-33         1.20e-24         3.50e-93         1.05e-123           Audio         1.05e-18         2.02e-06         6.36e-14         1.44e-14         1.67e-06         2.15e-32         6.78e-58           Jester         2.56e-37         2.44e-01         2.61e-110         1.30e-09         1.55e-220         9.97e-08         4.80e-57           Netflix         1.93e-53         1.09e-08         4.19e-01         3.62e-20         1.14e-24         1.63e-02         4.88e-22           Accidents         1.31e-15         3.78e-248         1.75e-226         7.16e-307         6.64e-50         2.12e-112         1.96e-141           Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36		4.39e-11	6.25e-03	6.25e-03	2.58e-03	4.27e-97		
Audio         1.05e-18         2.02e-06         6.36e-14         1.44e-14         1.67e-06         2.15e-32         6.78e-58           Jester         2.56e-37         2.44e-01         2.61e-110         1.30e-09         1.55e-220         9.97e-08         4.80e-57           Netflix         1.93e-53         1.09e-08         4.19e-01         3.62e-20         1.14e-24         1.63e-02         4.88e-22           Accidents         1.31e-15         3.78e-248         1.75e-226         7.16e-307         6.64e-50         2.12e-112         1.96e-141           Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33	MSNBC	4.39e-11 1.79e-34	6.25e-03 5.88e-95	6.25e-03 5.34e-06	2.58e-03 1.45e-36	4.27e-97 0.00e+00	3.02e-91	2.07e-18
Jester         2.56e-37         2.44e-01         2.61e-110         1.30e-09         1.55e-220         9.97e-08         4.80e-57           Netflix         1.93e-53         1.09e-08         4.19e-01         3.62e-20         1.14e-24         1.63e-02         4.88e-22           Accidents         1.31e-15         3.78e-248         1.75e-226         7.16e-307         6.64e-50         2.12e-112         1.96e-141           Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33	$\begin{array}{c} MSNBC \\ KDDCup2k \end{array}$	4.39e-11 1.79e-34 0.00e+00	6.25e-03 5.88e-95 0.00e+00	6.25e-03 5.34e-06 0.00e+00	2.58e-03 1.45e-36 0.00e+00	4.27e-97 0.00e+00 0.00e+00	3.02e-91 0.00e+00	2.07e-18 0.00e+00
Netflix         1.93e-53         1.09e-08         4.19e-01         3.62e-20         1.14e-24         1.63e-02         4.88e-22           Accidents         1.31e-15         3.78e-248         1.75e-226         7.16e-307         6.64e-50         2.12e-112         1.96e-141           Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50	MSNBC KDDCup2k Plants	4.39e-11 1.79e-34 0.00e+00 4.35e-18	6.25e-03 5.88e-95 0.00e+00 6.21e-27	6.25e-03 5.34e-06 0.00e+00 6.83e-49	2.58e-03 1.45e-36 0.00e+00 6.39e-33	4.27e-97 0.00e+00 0.00e+00 1.20e-24	3.02e-91 0.00e+00 3.50e-93	2.07e-18 0.00e+00 1.05e-123
Accidents         1.31e-15         3.78e-248         1.75e-226         7.16e-307         6.64e-50         2.12e-112         1.96e-141           Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.36e-53	MSNBC KDDCup2k Plants Audio	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06	3.02e-91 0.00e+00 3.50e-93 2.15e-32	2.07e-18 0.00e+00 1.05e-123 6.78e-58
Retail         7.06e-07         2.10e-04         1.82e-04         6.56e-01         1.15e-13         1.33e-03         1.13e-03           Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-96           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.6e-53           Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113	MSNBC KDDCup2k Plants Audio Jester	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220	3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57
Pumsb-star         1.32e-54         9.62e-43         1.71e-18         6.72e-157         8.03e-110         7.75e-80         9.17e-120           DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.36e-53           Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113           BBC         3.88e-26         3.93e-17         3.81e-15         1.91e-34         2.23e-01         1.16e-38         2.03e-38 <th>MSNBC KDDCup2k Plants Audio Jester Netflix</th> <th>4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53</th> <th>6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08</th> <th>6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01</th> <th>2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20</th> <th>4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24</th> <th>3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08 1.63e-02</th> <th>2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22</th>	MSNBC KDDCup2k Plants Audio Jester Netflix	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24	3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08 1.63e-02	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22
DNA         2.11e-110         5.24e-25         1.03e-12         1.12e-152         7.23e-42         2.43e-153         1.69e-124           Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.36e-53           Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113           BBC         3.88e-26         3.93e-17         3.81e-15         1.91e-34         2.23e-01         1.16e-38         2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50	3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08 1.63e-02 2.12e-112	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22 1.96e-141
Kosarek         8.13e-15         1.50e-10         2.57e-48         9.33e-02         3.96e-70         1.53e-02         1.23e-36           MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.36e-53           Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113           BBC         3.88e-26         3.93e-17         3.81e-15         1.91e-34         2.23e-01         1.16e-38         2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13	3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08 1.63e-02 2.12e-112 1.33e-03	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22 1.96e-141 1.13e-03
MSWeb         2.69e-22         4.21e-48         1.37e-92         4.37e-32         3.08e-164         4.56e-76         8.12e-97           Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.36e-53           Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113           BBC         3.88e-26         3.93e-17         3.81e-15         1.91e-34         2.23e-01         1.16e-38         2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110	3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08 1.63e-02 2.12e-112 1.33e-03 7.75e-80	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22 1.96e-141 1.13e-03 9.17e-120
Book         1.64e-07         2.11e-33         8.15e-14         9.54e-11         6.17e-101         3.11e-11         6.78e-33           EachMovie         2.23e-30         3.78e-17         2.51e-15         4.01e-24         1.30e-01         2.79e-51         7.66e-50           WebKB         1.43e-21         1.09e-08         2.12e-05         8.16e-36         1.75e-38         7.68e-13         3.36e-53           Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113           BBC         3.88e-26         3.93e-17         3.81e-15         1.91e-34         2.23e-01         1.16e-38         2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 1.03e-12	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 1.12e-152	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42	3.02e-91 0.00e+00 3.50e-93 2.15e-32 9.97e-08 1.63e-02 2.12e-112 1.33e-03 7.75e-80 2.43e-153	$\begin{array}{c} 2.07\text{e-}18 \\ 0.00\text{e+}00 \\ 1.05\text{e-}123 \\ 6.78\text{e-}58 \\ 4.80\text{e-}57 \\ 4.88\text{e-}22 \\ 1.96\text{e-}141 \\ 1.13\text{e-}03 \\ 9.17\text{e-}120 \\ 1.69\text{e-}124 \end{array}$
EachMovie       2.23e-30       3.78e-17       2.51e-15       4.01e-24       1.30e-01       2.79e-51       7.66e-50         WebKB       1.43e-21       1.09e-08       2.12e-05       8.16e-36       1.75e-38       7.68e-13       3.36e-53         Reuters-52       2.73e-60       5.84e-34       1.33e-33       3.85e-72       5.43e-11       1.29e-112       9.45e-113         BBC       3.88e-26       3.93e-17       3.81e-15       1.91e-34       2.23e-01       1.16e-38       2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 1.03e-12 2.57e-48	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 1.12e-152 9.33e-02	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42 3.96e-70	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e+}00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \end{array}$	$\begin{array}{c} 2.07\text{e-}18 \\ 0.00\text{e+}00 \\ 1.05\text{e-}123 \\ 6.78\text{e-}58 \\ 4.80\text{e-}57 \\ 4.88\text{e-}22 \\ 1.96\text{e-}141 \\ 1.13\text{e-}03 \\ 9.17\text{e-}120 \\ 1.69\text{e-}124 \\ 1.23\text{e-}36 \end{array}$
WebKB       1.43e-21       1.09e-08       2.12e-05       8.16e-36       1.75e-38       7.68e-13       3.36e-53         Reuters-52       2.73e-60       5.84e-34       1.33e-33       3.85e-72       5.43e-11       1.29e-112       9.45e-113         BBC       3.88e-26       3.93e-17       3.81e-15       1.91e-34       2.23e-01       1.16e-38       2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek MSWeb	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15 2.69e-22	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10 4.21e-48	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 1.03e-12 2.57e-48 1.37e-92	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 9.33e-02 4.37e-32	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42 3.96e-70 3.08e-164	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e}+00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \\ 4.56\text{e-}76 \end{array}$	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22 1.96e-141 1.13e-03 9.17e-120 1.69e-124 1.23e-36 8.12e-97
Reuters-52         2.73e-60         5.84e-34         1.33e-33         3.85e-72         5.43e-11         1.29e-112         9.45e-113           BBC         3.88e-26         3.93e-17         3.81e-15         1.91e-34         2.23e-01         1.16e-38         2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek MSWeb Book	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15 2.69e-22 1.64e-07	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10 4.21e-48 2.11e-33	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 1.75e-226 1.82e-04 1.71e-18 1.03e-12 2.57e-48 1.37e-92 8.15e-14	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 1.12e-152 9.33e-02 4.37e-32 9.54e-11	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42 3.96e-70 3.08e-164 6.17e-101	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e}+00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \\ 4.56\text{e-}76 \\ 3.11\text{e-}11 \end{array}$	$\begin{array}{c} 2.07 \text{e-} 18 \\ 0.00 \text{e+} 00 \\ 1.05 \text{e-} 123 \\ 6.78 \text{e-} 58 \\ 4.80 \text{e-} 57 \\ 4.88 \text{e-} 22 \\ 1.96 \text{e-} 141 \\ 1.13 \text{e-} 03 \\ 9.17 \text{e-} 120 \\ 1.69 \text{e-} 124 \\ 1.23 \text{e-} 36 \\ 8.12 \text{e-} 97 \\ 6.78 \text{e-} 33 \end{array}$
BBC 3.88e-26 3.93e-17 3.81e-15 1.91e-34 2.23e-01 1.16e-38 2.03e-38	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek MSWeb Book EachMovie	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15 2.69e-22 1.64e-07 2.23e-30	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10 4.21e-48 2.11e-33 3.78e-17	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 1.03e-12 2.57e-48 1.37e-92 8.15e-14 2.51e-15	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 1.12e-152 9.33e-02 4.37e-32 9.54e-11 4.01e-24	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42 3.96e-70 3.08e-164 6.17e-101 1.30e-01	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e+}00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \\ 4.56\text{e-}76 \\ 3.11\text{e-}11 \\ 2.79\text{e-}51 \end{array}$	2.07e-18 0.00e+00 1.05e-123 6.78e-58 4.80e-57 4.88e-22 1.96e-141 1.13e-03 9.17e-120 1.69e-124 1.23e-36 8.12e-97 6.78e-33 7.66e-50
	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek MSWeb Book EachMovie WebKB	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15 2.69e-22 1.64e-07 2.23e-30 1.43e-21	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10 4.21e-48 2.11e-33 3.78e-17 1.09e-08	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 1.03e-12 2.57e-48 1.37e-92 8.15e-14 2.51e-15 2.12e-05	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 1.12e-152 9.33e-02 4.37e-32 9.54e-11 4.01e-24 8.16e-36	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42 3.96e-70 3.08e-164 6.17e-101 1.30e-01 1.75e-38	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e}+00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \\ 4.56\text{e-}76 \\ 3.11\text{e-}11 \\ 2.79\text{e-}51 \\ 7.68\text{e-}13 \end{array}$	$\begin{array}{c} 2.07 \text{e-} 18 \\ 0.00 \text{e+} 00 \\ 1.05 \text{e-} 123 \\ 6.78 \text{e-} 58 \\ 4.80 \text{e-} 57 \\ 4.88 \text{e-} 22 \\ 1.96 \text{e-} 141 \\ 1.13 \text{e-} 03 \\ 9.17 \text{e-} 120 \\ 1.69 \text{e-} 124 \\ 1.23 \text{e-} 36 \\ 8.12 \text{e-} 97 \\ 6.78 \text{e-} 33 \\ 7.66 \text{e-} 50 \\ 3.36 \text{e-} 53 \end{array}$
Ad 1.99e-02 2.15e-63 5.39e-67 1.04e-35 4.32e-35 5.28e-17 1.06e-18	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek MSWeb Book EachMovie WebKB Reuters-52	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15 2.69e-22 1.64e-07 2.23e-30 1.43e-21 2.73e-60	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10 4.21e-48 2.11e-33 3.78e-17 1.09e-08 5.84e-34	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 1.03e-12 2.57e-48 1.37e-92 8.15e-14 2.51e-15 2.12e-05 1.33e-33	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 1.12e-152 9.33e-02 4.37e-32 9.54e-11 4.01e-24 8.16e-36 3.85e-72	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 7.23e-42 3.96e-70 3.08e-164 6.17e-101 1.30e-01 1.75e-38 5.43e-11	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e}+00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \\ 4.56\text{e-}76 \\ 3.11\text{e-}11 \\ 2.79\text{e-}51 \\ 7.68\text{e-}13 \\ 1.29\text{e-}112 \end{array}$	$\begin{array}{c} 2.07 \text{e-} 18 \\ 0.00 \text{e+} 00 \\ 1.05 \text{e-} 123 \\ 6.78 \text{e-} 58 \\ 4.80 \text{e-} 57 \\ 4.88 \text{e-} 22 \\ 1.96 \text{e-} 141 \\ 1.13 \text{e-} 03 \\ 9.17 \text{e-} 120 \\ 1.69 \text{e-} 124 \\ 1.23 \text{e-} 36 \\ 8.12 \text{e-} 97 \\ 6.78 \text{e-} 33 \\ 7.66 \text{e-} 50 \\ 3.36 \text{e-} 53 \\ 9.45 \text{e-} 113 \end{array}$
	MSNBC KDDCup2k Plants Audio Jester Netflix Accidents Retail Pumsb-star DNA Kosarek MSWeb Book EachMovie WebKB Reuters-52 BBC	4.39e-11 1.79e-34 0.00e+00 4.35e-18 1.05e-18 2.56e-37 1.93e-53 1.31e-15 7.06e-07 1.32e-54 2.11e-110 8.13e-15 2.69e-22 1.64e-07 2.23e-30 1.43e-21 2.73e-60 3.88e-26	6.25e-03 5.88e-95 0.00e+00 6.21e-27 2.02e-06 2.44e-01 1.09e-08 3.78e-248 2.10e-04 9.62e-43 5.24e-25 1.50e-10 4.21e-48 2.11e-33 3.78e-17 1.09e-08 5.84e-34 3.93e-17	6.25e-03 5.34e-06 0.00e+00 6.83e-49 6.36e-14 2.61e-110 4.19e-01 1.75e-226 1.82e-04 1.71e-18 2.57e-48 1.37e-92 8.15e-14 2.51e-15 2.12e-05 1.33e-33 3.81e-15	2.58e-03 1.45e-36 0.00e+00 6.39e-33 1.44e-14 1.30e-09 3.62e-20 7.16e-307 6.56e-01 6.72e-157 9.33e-02 4.37e-32 9.54e-11 4.01e-24 8.16e-36 3.85e-72 1.91e-34	4.27e-97 0.00e+00 0.00e+00 1.20e-24 1.67e-06 1.55e-220 1.14e-24 6.64e-50 1.15e-13 8.03e-110 3.08e-164 6.17e-101 1.30e-01 1.75e-38 5.43e-11 2.23e-01	$\begin{array}{c} 3.02\text{e-}91 \\ 0.00\text{e}+00 \\ 3.50\text{e-}93 \\ 2.15\text{e-}32 \\ 9.97\text{e-}08 \\ 1.63\text{e-}02 \\ 2.12\text{e-}112 \\ 1.33\text{e-}03 \\ 7.75\text{e-}80 \\ 2.43\text{e-}153 \\ 1.53\text{e-}02 \\ 4.56\text{e-}76 \\ 3.11\text{e-}11 \\ 2.79\text{e-}51 \\ 7.68\text{e-}13 \\ 1.29\text{e-}112 \\ 1.16\text{e-}38 \end{array}$	$\begin{array}{c} 2.07 \text{e-} 18 \\ 0.00 \text{e+} 00 \\ 1.05 \text{e-} 123 \\ 6.78 \text{e-} 58 \\ 4.80 \text{e-} 57 \\ 4.88 \text{e-} 22 \\ 1.96 \text{e-} 141 \\ 1.13 \text{e-} 03 \\ 9.17 \text{e-} 120 \\ 1.69 \text{e-} 124 \\ 1.23 \text{e-} 36 \\ 8.12 \text{e-} 97 \\ 6.78 \text{e-} 33 \\ 7.66 \text{e-} 50 \\ 3.36 \text{e-} 53 \\ 9.45 \text{e-} 113 \\ 2.03 \text{e-} 38 \end{array}$

Table 3: Pairwise Wilcoxon signed rank test p-values for the comparisons of test log likelihoods for each algorithmic pair (columns) on all datasets (rows).

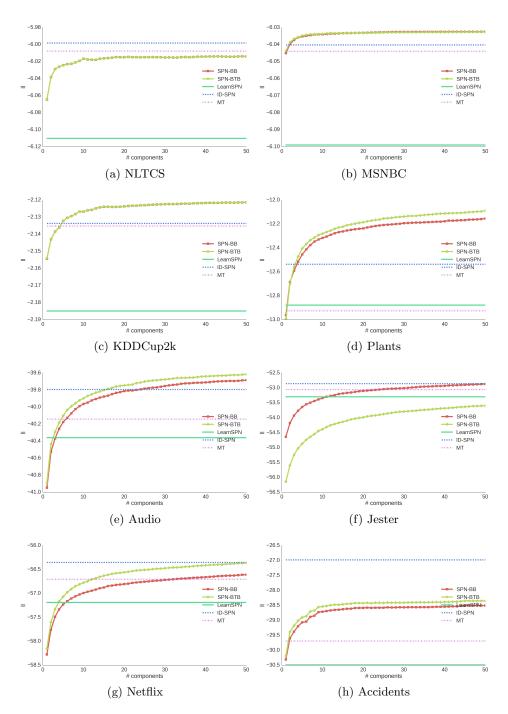


Fig. 1: Average test likelihood values (y-axis) for SPN-BB and SPN-BTB while increasing k (x-axis) on NLTCS, MSNBC, KDDCup2k, Plants, Audio, Jester, Netflix, Accidents. The best values for LearnSPN, ID-SPN and MT are reported as well.

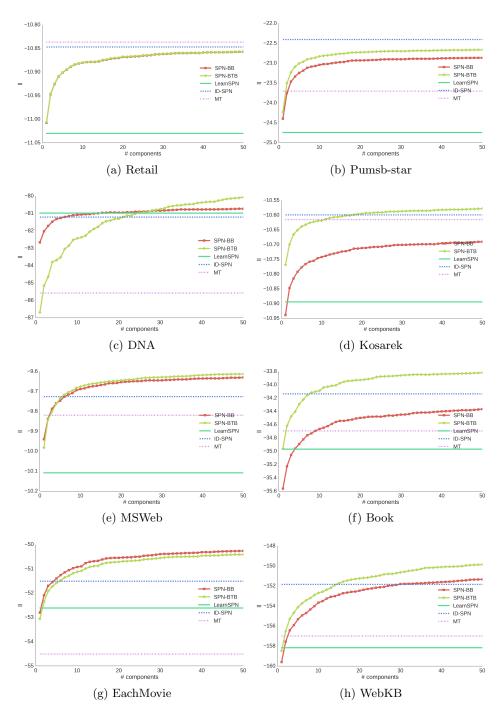


Fig. 2: Average test likelihood values (y-axis) for SPN-BB and SPN-BTB while increasing k (x-axis)on Retail, Pumsb-star, DNA, Kosarek, MSWeb, Book, Each-Movie, WebKB. The best values for LearnSPN, ID-SPN and MT are reported as well.

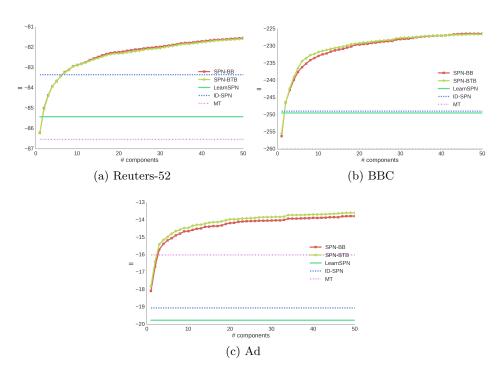


Fig. 3: Average test likelihood values (y-axis) for SPN-BB and SPN-BTB while increasing k (x-axis) on Reuters-52, BBC and Ad. The best values for LearnSPN, ID-SPN and MT are reported as well.