

1 fb15k Evaluation

1.1 Average

1.1.1 Average Hits@K

	hits@1	hits@3	hits@5	hits@10
complex	10.06 ± 0.42	20.82 ± 0.67	27.59 ± 0.94	38.03 ± 1.02
conve	48.28 ± 0.12	66.99 ± 0.04	73.27 ± 0.03	79.76 ± 0.07
distmult	16.45 ± 0.16	29.10 ± 0.17	35.54 ± 0.21	45.00 ± 0.25
hole	21.79 ± 0.19	39.69 ± 0.24	48.06 ± 0.30	58.84 ± 0.28
kg2e	0.11 ± 0.04	0.36 ± 0.08	0.56 ± 0.10	1.01 ± 0.14
rotate	41.53 ± 0.06	64.14 ± 0.07	71.23 ± 0.05	78.67 ± 0.08
simple	0.01 ± 0.00	0.03 ± 0.01	0.05 ± 0.01	0.08 ± 0.02
transd	21.22 ± 0.03	40.48 ± 0.10	48.57 ± 0.09	58.71 ± 0.14
transe	15.23 ± 0.16	29.85 ± 0.24	37.18 ± 0.24	47.34 ± 0.18
transh	1.69 ± 0.25	2.95 ± 0.20	3.29 ± 0.22	3.74 ± 0.18
transr	0.37 ± 0.00	0.63 ± 0.04	0.78 ± 0.06	1.03 ± 0.07

1.1.2 Average Mean Ranks

	MR	MRR	AMR
complex	171.16 ± 16.05	19.13 ± 0.45	2.46 ± 0.28
conve	50.76 ± 0.40	59.56 ± 0.06	0.73 ± 0.01
distmult	134.02 ± 1.98	26.06 ± 0.17	1.86 ± 0.03
hole	193.03 ± 7.61	34.15 ± 0.22	2.71 ± 0.12
kg2e	5779.07 ± 51.02	0.58 ± 0.07	78.40 ± 0.68
rotate	42.28 ± 0.13	55.00 ± 0.06	0.63 ± 0.00
simple	7385.76 ± 8.42	0.07 ± 0.01	99.89 ± 0.12
transd	153.37 ± 5.35	33.99 ± 0.03	2.29 ± 0.09
transe	127.92 ± 0.86	26.01 ± 0.17	1.78 ± 0.01
transh	6320.02 ± 30.37	2.54 ± 0.20	85.63 ± 0.40
transr	6795.95 ± 16.65	0.65 ± 0.02	91.99 ± 0.22

1.2 Best

1.2.1 Best Hits@K

	hits@1	hits@3	hits@5	hits@10
complex	10.06 \pm 0.42	20.82 \pm 0.67	27.59 \pm 0.94	38.03 \pm 1.02
conve	48.28 \pm 0.12	66.99 \pm 0.04	73.27 \pm 0.03	79.76 \pm 0.07
distmult	16.45 \pm 0.16	29.10 \pm 0.17	35.54 \pm 0.21	45.00 \pm 0.25
hole	21.79 \pm 0.19	39.69 \pm 0.24	48.06 \pm 0.30	58.84 \pm 0.28
kg2e	0.11 \pm 0.04	0.36 \pm 0.08	0.56 \pm 0.10	1.01 \pm 0.14
rotate	41.53 \pm 0.06	64.14 \pm 0.07	71.23 \pm 0.05	78.67 \pm 0.08
simple	0.01 \pm 0.00	0.03 \pm 0.01	0.05 \pm 0.01	0.09 \pm 0.01
transd	21.22 \pm 0.03	40.48 \pm 0.10	48.57 \pm 0.09	58.71 \pm 0.14
transe	15.23 \pm 0.16	29.85 \pm 0.24	37.18 \pm 0.24	47.34 \pm 0.18
transh	1.69 \pm 0.25	2.95 \pm 0.20	3.29 \pm 0.22	3.74 \pm 0.18
transr	0.37 \pm 0.00	0.63 \pm 0.04	0.78 \pm 0.06	1.03 \pm 0.07

1.2.2 Best Mean Ranks

	MR	MRR
complex	171.16 \pm 16.05	19.13 \pm 0.45
conve	50.76 \pm 0.40	59.56 \pm 0.06
distmult	134.02 \pm 1.98	26.06 \pm 0.17
hole	193.03 \pm 7.61	34.15 \pm 0.22
kg2e	5779.07 \pm 51.02	0.58 \pm 0.07
rotate	42.28 \pm 0.13	55.00 \pm 0.06
simple	2908.87 \pm 471.26	0.22 \pm 0.05
transd	153.37 \pm 5.35	33.99 \pm 0.03
transe	127.92 \pm 0.86	26.01 \pm 0.17
transh	6320.00 \pm 30.37	2.54 \pm 0.20
transr	6795.94 \pm 16.65	0.65 \pm 0.02

1.3 Worst

1.3.1 Worst Hits@K

	hits@1	hits@3	hits@5	hits@10
complex	10.06 ± 0.42	20.82 ± 0.67	27.59 ± 0.94	38.03 ± 1.02
conve	48.28 ± 0.12	66.99 ± 0.04	73.27 ± 0.03	79.76 ± 0.07
distmult	16.45 ± 0.16	29.10 ± 0.17	35.54 ± 0.21	45.00 ± 0.25
hole	21.79 ± 0.19	39.69 ± 0.24	48.06 ± 0.30	58.84 ± 0.28
kg2e	0.11 ± 0.04	0.36 ± 0.08	0.56 ± 0.10	1.01 ± 0.14
rotate	41.53 ± 0.06	64.14 ± 0.07	71.23 ± 0.05	78.67 ± 0.08
simple	0.01 ± 0.00	0.03 ± 0.01	0.05 ± 0.01	0.08 ± 0.02
transd	21.22 ± 0.03	40.48 ± 0.10	48.57 ± 0.09	58.71 ± 0.14
transe	15.23 ± 0.16	29.85 ± 0.24	37.18 ± 0.24	47.34 ± 0.18
transh	1.69 ± 0.25	2.95 ± 0.20	3.29 ± 0.22	3.74 ± 0.18
transr	0.37 ± 0.00	0.63 ± 0.04	0.78 ± 0.06	1.03 ± 0.07

1.3.2 Worst Mean Ranks

	MR	MRR
complex	171.16 ± 16.05	19.13 ± 0.45
conve	50.76 ± 0.40	59.56 ± 0.06
distmult	134.02 ± 1.98	26.06 ± 0.17
hole	193.03 ± 7.61	34.15 ± 0.22
kg2e	5779.07 ± 51.02	0.58 ± 0.07
rotate	42.28 ± 0.13	55.00 ± 0.06
simple	11862.65 ± 474.02	0.06 ± 0.01
transd	153.37 ± 5.35	33.99 ± 0.03
transe	127.92 ± 0.86	26.01 ± 0.17
transh	6320.05 ± 30.37	2.54 ± 0.20
transr	6795.95 ± 16.65	0.65 ± 0.02

2 fb15k237 Evaluation

2.1 Average

2.1.1 Average Hits@K

	hits@1	hits@3	hits@5	hits@10
conve	18.22 ± 0.11	29.51 ± 0.24	35.98 ± 0.16	44.95 ± 0.17

2.1.2 Average Mean Ranks

	MR	MRR	AMR
conve	255.46 ± 6.16	26.93 ± 0.11	3.73 ± 0.13

2.2 Best

2.2.1 Best Hits@K

	hits@1	hits@3	hits@5	hits@10
conve	18.22 ± 0.11	29.51 ± 0.24	35.98 ± 0.16	44.95 ± 0.17

2.2.2 Best Mean Ranks

	MR	MRR
conve	255.46 ± 6.16	26.93 ± 0.11

2.3 Worst

2.3.1 Worst Hits@K

	hits@1	hits@3	hits@5	hits@10
conve	18.22 ± 0.11	29.51 ± 0.24	35.98 ± 0.16	44.95 ± 0.17

2.3.2 Worst Mean Ranks

	MR	MRR
conve	255.46 ± 6.16	26.93 ± 0.11

3 wn18 Evaluation

3.1 Average

3.1.1 Average Hits@K

	hits@1	hits@3	hits@5	hits@10
complex	12.36 ± 1.96	20.66 ± 2.75	25.24 ± 3.33	32.92 ± 4.40
conve	85.14 ± 0.10	91.76 ± 0.11	93.29 ± 0.04	94.85 ± 0.06
distmult	67.45 ± 0.34	85.94 ± 0.21	89.52 ± 0.25	92.72 ± 0.18
hole	58.66 ± 0.81	79.09 ± 0.41	83.68 ± 0.25	88.53 ± 0.36
kg2e	1.35 ± 0.22	3.21 ± 0.31	4.57 ± 0.34	7.02 ± 0.43
rotate	82.17 ± 0.20	91.53 ± 0.12	93.44 ± 0.07	95.28 ± 0.08
simple	0.00 ± 0.00	0.00 ± 0.01	0.01 ± 0.01	0.02 ± 0.02
transd	3.94 ± 0.27	65.63 ± 0.55	79.64 ± 0.43	87.27 ± 0.41
transe	9.70 ± 2.93	59.83 ± 0.95	71.41 ± 0.71	81.22 ± 0.47
transh	0.04 ± 0.02	0.19 ± 0.10	0.29 ± 0.14	0.39 ± 0.11
transr	0.00 ± 0.00	0.04 ± 0.02	0.05 ± 0.03	0.11 ± 0.06

3.1.2 Average Mean Ranks

	MR	MRR	AMR
complex	452.67 \pm 63.05	19.49 \pm 2.55	2.21 \pm 0.31
conve	444.40 \pm 14.82	88.81 \pm 0.09	2.17 \pm 0.07
distmult	458.64 \pm 23.96	77.44 \pm 0.22	2.24 \pm 0.12
hole	814.59 \pm 80.68	69.98 \pm 0.53	3.98 \pm 0.39
kg2e	2708.89 \pm 44.57	3.61 \pm 0.26	13.25 \pm 0.22
rotate	123.68 \pm 1.71	87.29 \pm 0.12	0.61 \pm 0.01
simple	20551.64 \pm 95.33	0.03 \pm 0.00	100.43 \pm 0.46
transd	444.39 \pm 25.61	36.22 \pm 0.12	2.17 \pm 0.13
transe	502.96 \pm 27.45	37.07 \pm 1.84	2.46 \pm 0.13
transh	19678.04 \pm 18.92	0.18 \pm 0.04	96.16 \pm 0.09
transr	19686.49 \pm 100.97	0.06 \pm 0.02	96.20 \pm 0.49

3.2 Best

3.2.1 Best Hits@K

	hits@1	hits@3	hits@5	hits@10
complex	12.36 \pm 1.96	20.66 \pm 2.75	25.24 \pm 3.33	32.92 \pm 4.40
conve	85.14 \pm 0.10	91.76 \pm 0.11	93.29 \pm 0.04	94.85 \pm 0.06
distmult	67.45 \pm 0.34	85.94 \pm 0.21	89.52 \pm 0.25	92.72 \pm 0.18
hole	58.66 \pm 0.81	79.09 \pm 0.41	83.68 \pm 0.25	88.53 \pm 0.36
kg2e	1.35 \pm 0.22	3.21 \pm 0.31	4.57 \pm 0.34	7.02 \pm 0.43
rotate	82.17 \pm 0.20	91.53 \pm 0.12	93.44 \pm 0.07	95.28 \pm 0.08
simple	0.00 \pm 0.00	0.00 \pm 0.01	0.01 \pm 0.01	0.02 \pm 0.02
transd	3.94 \pm 0.27	65.63 \pm 0.55	79.64 \pm 0.43	87.27 \pm 0.41
transe	9.70 \pm 2.93	59.83 \pm 0.95	71.41 \pm 0.71	81.22 \pm 0.47
transh	0.04 \pm 0.02	0.19 \pm 0.10	0.29 \pm 0.14	0.39 \pm 0.11
transr	0.00 \pm 0.00	0.04 \pm 0.02	0.05 \pm 0.03	0.11 \pm 0.06

3.2.2 Best Mean Ranks

	MR	MRR
complex	452.67 \pm 63.05	19.49 \pm 2.55
conve	444.40 \pm 14.82	88.81 \pm 0.09
distmult	458.64 \pm 23.96	77.44 \pm 0.22
hole	814.59 \pm 80.68	69.98 \pm 0.53
kg2e	2708.88 \pm 44.57	3.61 \pm 0.26
rotate	123.68 \pm 1.71	87.29 \pm 0.12
simple	20513.74 \pm 92.22	0.03 \pm 0.00
transd	444.39 \pm 25.61	36.22 \pm 0.12
transe	502.95 \pm 27.45	37.07 \pm 1.84
transh	19678.02 \pm 18.92	0.18 \pm 0.04
transr	19686.49 \pm 100.97	0.06 \pm 0.02

3.3 Worst

3.3.1 Worst Hits@K

	hits@1	hits@3	hits@5	hits@10
complex	12.36 \pm 1.96	20.66 \pm 2.75	25.24 \pm 3.33	32.92 \pm 4.40
conve	85.14 \pm 0.10	91.76 \pm 0.11	93.29 \pm 0.04	94.85 \pm 0.06
distmult	67.45 \pm 0.34	85.94 \pm 0.21	89.52 \pm 0.25	92.72 \pm 0.18
hole	58.66 \pm 0.81	79.09 \pm 0.41	83.68 \pm 0.25	88.53 \pm 0.36
kg2e	1.35 \pm 0.22	3.21 \pm 0.31	4.57 \pm 0.34	7.02 \pm 0.43
rotate	82.17 \pm 0.20	91.53 \pm 0.12	93.44 \pm 0.07	95.28 \pm 0.08
simple	0.00 \pm 0.00	0.00 \pm 0.01	0.01 \pm 0.01	0.02 \pm 0.02
transd	3.94 \pm 0.27	65.63 \pm 0.55	79.64 \pm 0.43	87.27 \pm 0.41
transe	9.70 \pm 2.93	59.83 \pm 0.95	71.41 \pm 0.71	81.22 \pm 0.47
transh	0.04 \pm 0.02	0.19 \pm 0.10	0.29 \pm 0.14	0.39 \pm 0.11
transr	0.00 \pm 0.00	0.04 \pm 0.02	0.05 \pm 0.03	0.11 \pm 0.06

3.3.2 Worst Mean Ranks

	MR	MRR
complex	452.67 ± 63.05	19.49 ± 2.55
conve	444.40 ± 14.82	88.81 ± 0.09
distmult	458.64 ± 23.96	77.44 ± 0.22
hole	814.59 ± 80.68	69.98 ± 0.53
kg2e	2708.89 ± 44.57	3.61 ± 0.26
rotate	123.68 ± 1.71	87.29 ± 0.12
simple	20589.54 ± 100.76	0.03 ± 0.00
transd	444.39 ± 25.61	36.22 ± 0.12
transe	502.96 ± 27.45	37.07 ± 1.84
transh	19678.06 ± 18.92	0.18 ± 0.04
transr	19686.50 ± 100.97	0.06 ± 0.02

4 wn18rr Evaluation

4.1 Average

4.1.1 Average Hits@K

	hits@1	hits@3	hits@5	hits@10
conve	40.98 ± 0.22	46.49 ± 0.14	48.92 ± 0.23	51.76 ± 0.13

4.1.2 Average Mean Ranks

	MR	MRR	AMR
conve	5369.49 ± 50.92	44.69 ± 0.21	26.49 ± 0.25

4.2 Best

4.2.1 Best Hits@K

	hits@1	hits@3	hits@5	hits@10
conve	40.98 ± 0.22	46.49 ± 0.14	48.92 ± 0.23	51.76 ± 0.13

4.2.2 Best Mean Ranks

	MR	MRR
conve	5369.49 ± 50.92	44.69 ± 0.21

4.3 Worst

4.3.1 Worst Hits@K

	hits@1	hits@3	hits@5	hits@10
conve	40.98 ± 0.22	46.49 ± 0.14	48.92 ± 0.23	51.76 ± 0.13

4.3.2 Worst Mean Ranks

	MR	MRR
conve	5369.49 ± 50.92	44.69 ± 0.21