Dataset	Model	Bytes	Parameters
FB15k	**ComplEx**	26.1 MB	6.5 M
	ConvE	22.5 MB	5.6 M
	DistMult	6.5 MB	1.6 M
	HolE	9.8 MB	2.4 M
	KG2E	6.5 MB	1.6 M
	RotatE	130.4 MB	32.6 M
	SimplE	26.1 MB	6.5 M
	TransD	6.5 MB	1.6 M
	TransE	3.3 MB	814.8 k
	TransH	7.1 MB	1.8 M
	TransR	16.7 MB	4.2 M
	TuckER	46.1 MB	11.5 M
FB15k237	**ConvE**	20.3 MB	5.1 M
	ConvKB	5.9 MB	1.5 M
	RotatE	117.9 MB	29.5 M
WN18	**ComplEx**	49.2 MB	12.3 M
	ConvE	41.2 MB	10.3 M
	DistMult	16.4 MB	4.1 M
	HolE	24.6 MB	6.1 M
	KG2E	16.4 MB	4.1 M
	RotatE	163.8 MB	41.0 M
	SimplE	65.5 MB	16.4 M
	TransD	16.4 MB	4.1 M
	TransE	3.3 MB	819.2 k
	TransH	8.2 MB	2.0 M
	TransR	8.4 MB	2.1 M
	TuckER	37.6 MB	9.4 M
WN18RR	**ConvE**	40.9 MB	10.2 M
	ConvKB	8.2 MB	2.1 M
	RotatE	162.3 MB	40.6 M

I. FB15k Evaluation

A. FB15k Average

B. FB15k Best

C. FB15k Worst

II. FB15k237 Evaluation

A. FB15k237 Average

B. FB15k237 Best

C. FB15k237 Worst

III. WN18 Evaluation

A. WN18 Average

B. WN18 Best

C. WN18 Worst

IV. WN18RR Evaluation

A. WN18RR Average

B. WN18RR Best

C. WN18RR Worst

TABLE I
REPRODUCTION RESULTS ON FB15K BASED ON AN AVERAGE RANKING

	MR	MRR (%)	AMR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ComplEx	171.16 ± 16.05	19.13 ± 0.45	2.46 ± 0.28	10.06 ± 0.42	20.82 ± 0.67	27.59 ± 0.94	38.03 ± 1.02
ConvE	50.76 ± 0.40	59.56 ± 0.06	0.73 ± 0.01	48.28 ± 0.12	66.99 ± 0.04	73.27 ± 0.03	79.76 ± 0.07
DistMult	134.02 ± 1.98	26.06 ± 0.17	1.86 ± 0.03	16.45 ± 0.16	29.10 ± 0.17	35.54 ± 0.21	45.00 ± 0.25
HolE	193.03 ± 7.61	34.15 ± 0.22	2.71 ± 0.12	21.79 ± 0.19	39.69 ± 0.24	48.06 ± 0.30	58.84 ± 0.28
KG2E	5779.07 ± 51.02	0.58 ± 0.07	78.40 ± 0.68	0.11 ± 0.04	0.36 ± 0.08	0.56 ± 0.10	1.01 ± 0.14
RotatE	42.28 ± 0.13	55.00 ± 0.06	0.63 ± 0.00	41.53 ± 0.06	64.14 ± 0.07	71.23 ± 0.05	78.67 ± 0.08
SimplE	7395.75 ± 2.02	0.04 ± 0.00	100.02 ± 0.03	0.01 ± 0.00	0.03 ± 0.00	0.04 ± 0.00	0.06 ± 0.01
TransD	153.37 ± 5.35	33.99 ± 0.03	2.29 ± 0.09	21.22 ± 0.03	40.48 ± 0.10	48.57 ± 0.09	58.71 ± 0.14
TransE	127.92 ± 0.86	26.01 ± 0.17	1.78 ± 0.01	15.23 ± 0.16	29.85 ± 0.24	37.18 ± 0.24	47.34 ± 0.18
TransH	6320.02 ± 30.37	2.54 ± 0.20	85.63 ± 0.40	1.69 ± 0.25	2.95 ± 0.20	3.29 ± 0.22	3.74 ± 0.18
TransR	6795.95 ± 16.65	0.65 ± 0.02	91.99 ± 0.22	0.37 ± 0.00	0.63 ± 0.04	0.78 ± 0.06	1.03 ± 0.07
TuckER	7327.77 ± 29.22	0.07 ± 0.02	99.11 ± 0.39	0.01 ± 0.00	0.02 ± 0.00	0.03 ± 0.01	0.15 ± 0.17

TABLE II
REPRODUCTION RESULTS ON FB15K BASED ON AN OPTIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ComplEx	171.16 ± 16.05	19.13 ± 0.45	10.06 ± 0.42	20.82 ± 0.67	27.59 ± 0.94	38.03 ± 1.02
ConvE	50.76 ± 0.40	59.56 ± 0.06	48.28 ± 0.12	66.99 ± 0.04	73.27 ± 0.03	79.76 ± 0.07
DistMult	134.02 ± 1.98	26.06 ± 0.17	16.45 ± 0.16	29.10 ± 0.17	35.54 ± 0.21	45.00 ± 0.25
HolE	193.03 ± 7.61	34.15 ± 0.22	21.79 ± 0.19	39.69 ± 0.24	48.06 ± 0.30	58.84 ± 0.28
KG2E	5779.07 ± 51.02	0.58 ± 0.07	0.11 ± 0.04	0.36 ± 0.08	0.56 ± 0.10	1.01 ± 0.14
RotatE	42.28 ± 0.13	55.00 ± 0.06	41.53 ± 0.06	64.14 ± 0.07	71.23 ± 0.05	78.67 ± 0.08
SimplE	139.34 ± 49.45	23.90 ± 8.79	11.58 ± 6.42	24.16 ± 10.95	34.73 ± 13.40	54.28 ± 15.80
TransD	153.37 ± 5.35	33.99 ± 0.03	21.22 ± 0.03	40.48 ± 0.10	48.57 ± 0.09	58.71 ± 0.14
TransE	127.92 ± 0.86	26.01 ± 0.17	15.23 ± 0.16	29.85 ± 0.24	37.18 ± 0.24	47.34 ± 0.18
TransH	6320.00 ± 30.37	2.54 ± 0.20	1.69 ± 0.25	2.95 ± 0.20	3.29 ± 0.22	3.74 ± 0.18
TransR	6795.94 ± 16.65	0.65 ± 0.02	0.37 ± 0.00	0.63 ± 0.04	0.78 ± 0.06	1.03 ± 0.07
TuckER	7327.77 ± 29.22	0.07 ± 0.02	0.01 ± 0.00	0.02 ± 0.00	0.03 ± 0.01	0.15 ± 0.17

TABLE III
REPRODUCTION RESULTS ON FB15K BASED ON A PESSIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ComplEx	171.16 ± 16.05	19.13 ± 0.45	10.06 ± 0.42	20.82 ± 0.67	27.59 ± 0.94	38.03 ± 1.02
ConvE	50.76 ± 0.40	59.56 ± 0.06	48.28 ± 0.12	66.99 ± 0.04	73.27 ± 0.03	79.76 ± 0.07
DistMult	134.02 ± 1.98	26.06 ± 0.17	16.45 ± 0.16	29.10 ± 0.17	35.54 ± 0.21	45.00 ± 0.25
HolE	193.03 ± 7.61	34.15 ± 0.22	21.79 ± 0.19	39.69 ± 0.24	48.06 ± 0.30	58.84 ± 0.28
KG2E	5779.07 ± 51.02	0.58 ± 0.07	0.11 ± 0.04	0.36 ± 0.08	0.56 ± 0.10	1.01 ± 0.14
RotatE	42.28 ± 0.13	55.00 ± 0.06	41.53 ± 0.06	64.14 ± 0.07	71.23 ± 0.05	78.67 ± 0.08
SimplE	139.34 ± 49.45	23.90 ± 8.79	11.58 ± 6.42	24.16 ± 10.95	34.73 ± 13.40	54.28 ± 15.80
TransD	153.37 ± 5.35	33.99 ± 0.03	21.22 ± 0.03	40.48 ± 0.10	48.57 ± 0.09	58.71 ± 0.14
TransE	127.92 ± 0.86	26.01 ± 0.17	15.23 ± 0.16	29.85 ± 0.24	37.18 ± 0.24	47.34 ± 0.18
TransH	6320.00 ± 30.37	2.54 ± 0.20	1.69 ± 0.25	2.95 ± 0.20	3.29 ± 0.22	3.74 ± 0.18
TransR	6795.94 ± 16.65	0.65 ± 0.02	0.37 ± 0.00	0.63 ± 0.04	0.78 ± 0.06	1.03 ± 0.07
TuckER	7327.77 ± 29.22	0.07 ± 0.02	0.01 ± 0.00	0.02 ± 0.00	0.03 ± 0.01	0.15 ± 0.17

TABLE IV
REPRODUCTION RESULTS ON FB15K237 BASED ON AN AVERAGE RANKING

	MR	MRR (%)	AMR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ConvE	255.46 ± 6.16	26.93 ± 0.11	3.73 ± 0.13	18.22 ± 0.11	29.51 ± 0.24	35.98 ± 0.16	44.95 ± 0.17
ConvKB	4345.27 ± 46.99	4.71 ± 0.23	61.36 ± 0.65	3.31 ± 0.23	4.04 ± 0.19	4.57 ± 0.22	7.76 ± 0.88
RotatE	191.92 ± 0.31	26.42 ± 0.04	2.84 ± 0.00	17.57 ± 0.06	28.97 ± 0.05	35.29 ± 0.09	44.55 ± 0.06

TABLE V
REPRODUCTION RESULTS ON FB15K237 BASED ON AN OPTIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ConvE	255.46 ± 6.16	26.93 ± 0.11	18.22 ± 0.11	29.51 ± 0.24	35.98 ± 0.16	44.95 ± 0.17
ConvKB	4345.27 ± 46.99	4.71 ± 0.23	3.31 ± 0.23	4.04 ± 0.19	4.57 ± 0.22	7.76 ± 0.88
RotatE	191.92 ± 0.31	26.42 ± 0.04	17.57 ± 0.06	28.97 ± 0.05	35.29 ± 0.09	44.55 ± 0.06

TABLE VI
REPRODUCTION RESULTS ON FB15K237 BASED ON A PESSIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ConvE	255.46 ± 6.16	26.93 ± 0.11	18.22 ± 0.11	29.51 ± 0.24	35.98 ± 0.16	44.95 ± 0.17
ConvKB	4345.27 ± 46.99	4.71 ± 0.23	3.31 ± 0.23	4.04 ± 0.19	4.57 ± 0.22	7.76 ± 0.88
RotatE	191.92 ± 0.31	26.42 ± 0.04	17.57 ± 0.06	28.97 ± 0.05	35.29 ± 0.09	44.55 ± 0.06

TABLE VII
REPRODUCTION RESULTS ON WN18 BASED ON AN AVERAGE RANKING

	MR	MRR (%)	AMR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ComplEx	452.67 ± 63.05	19.49 ± 2.55	2.21 ± 0.31	12.36 ± 1.96	20.66 ± 2.75	25.24 ± 3.33	32.92 ± 4.40
ConvE	444.40 ± 14.82	88.81 ± 0.09	2.17 ± 0.07	85.14 ± 0.10	91.76 ± 0.11	93.29 ± 0.04	94.85 ± 0.06
DistMult	458.64 ± 23.96	77.44 ± 0.22	2.24 ± 0.12	67.45 ± 0.34	85.94 ± 0.21	89.52 ± 0.25	92.72 ± 0.18
HolE	812.64 ± 28.33	70.44 ± 0.45	3.97 ± 0.14	59.29 ± 0.53	79.29 ± 0.47	84.12 ± 0.36	88.61 ± 0.42
KG2E	2708.89 ± 44.57	3.61 ± 0.26	13.25 ± 0.22	1.35 ± 0.22	3.21 ± 0.31	4.57 ± 0.34	7.02 ± 0.43
RotatE	123.68 ± 1.71	87.29 ± 0.12	0.61 ± 0.01	82.17 ± 0.20	91.53 ± 0.12	93.44 ± 0.07	95.28 ± 0.08
SimplE	20376.43 ± 42.30	0.04 ± 0.01	99.57 ± 0.21	0.01 ± 0.01	0.03 ± 0.00	0.04 ± 0.01	0.07 ± 0.03
TransD	444.39 ± 25.61	36.22 ± 0.12	2.17 ± 0.13	3.94 ± 0.27	65.63 ± 0.55	79.64 ± 0.43	87.27 ± 0.41
TransE	468.24 ± 13.64	39.19 ± 1.21	2.29 ± 0.07	9.99 ± 1.82	64.74 ± 0.91	75.44 ± 0.48	84.25 ± 0.33
TransH	19678.04 ± 18.92	0.18 ± 0.04	96.16 ± 0.09	0.04 ± 0.02	0.19 ± 0.10	0.29 ± 0.14	0.39 ± 0.11
TransR	19686.49 ± 100.97	0.06 ± 0.02	96.20 ± 0.49	0.00 ± 0.00	0.04 ± 0.02	0.05 ± 0.03	0.11 ± 0.06
TuckER	20622.46 ± 153.52	0.03 ± 0.01	100.78 ± 0.75	0.00 ± 0.00	0.02 ± 0.01	0.03 ± 0.03	0.04 ± 0.03

TABLE VIII
REPRODUCTION RESULTS ON WN18 BASED ON AN OPTIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ComplEx	452.67 ± 63.05	19.49 ± 2.55	12.36 ± 1.96	20.66 ± 2.75	25.24 ± 3.33	32.92 ± 4.40
ConvE	444.40 ± 14.82	88.81 ± 0.09	85.14 ± 0.10	91.76 ± 0.11	93.29 ± 0.04	94.85 ± 0.06
DistMult	458.64 ± 23.96	77.44 ± 0.22	67.45 ± 0.34	85.94 ± 0.21	89.52 ± 0.25	92.72 ± 0.18
HolE	812.63 ± 28.33	70.44 ± 0.45	59.29 ± 0.53	79.29 ± 0.47	84.12 ± 0.36	88.61 ± 0.42
KG2E	2708.88 ± 44.57	3.61 ± 0.26	1.35 ± 0.22	3.21 ± 0.31	4.57 ± 0.34	7.02 ± 0.43
RotatE	123.68 ± 1.71	87.29 ± 0.12	82.17 ± 0.20	91.53 ± 0.12	93.44 ± 0.07	95.28 ± 0.08
SimplE	384.53 ± 66.45	38.48 ± 4.00	33.93 ± 4.32	39.59 ± 4.67	42.76 ± 3.73	47.01 ± 2.66
TransD	444.39 ± 25.61	36.22 ± 0.12	3.94 ± 0.27	65.63 ± 0.55	79.64 ± 0.43	87.27 ± 0.41
TransE	468.24 ± 13.64	39.19 ± 1.21	9.99 ± 1.82	64.74 ± 0.91	75.44 ± 0.48	84.25 ± 0.33
TransH	19678.02 ± 18.92	0.18 ± 0.04	0.04 ± 0.02	0.19 ± 0.10	0.29 ± 0.14	0.39 ± 0.11
TransR	19686.49 ± 100.97	0.06 ± 0.02	0.00 ± 0.00	0.04 ± 0.02	0.05 ± 0.03	0.11 ± 0.06
TuckER	20622.46 ± 153.52	0.03 ± 0.01	0.00 ± 0.00	0.02 ± 0.01	0.03 ± 0.03	0.04 ± 0.03

TABLE IX
REPRODUCTION RESULTS ON WN18 BASED ON A PESSIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ComplEx	452.67 ± 63.05	19.49 ± 2.55	12.36 ± 1.96	20.66 ± 2.75	25.24 ± 3.33	32.92 ± 4.40
ConvE	444.40 ± 14.82	88.81 ± 0.09	85.14 ± 0.10	91.76 ± 0.11	93.29 ± 0.04	94.85 ± 0.06
DistMult	458.64 ± 23.96	77.44 ± 0.22	67.45 ± 0.34	85.94 ± 0.21	89.52 ± 0.25	92.72 ± 0.18
HolE	812.63 ± 28.33	70.44 ± 0.45	59.29 ± 0.53	79.29 ± 0.47	84.12 ± 0.36	88.61 ± 0.42
KG2E	2708.88 ± 44.57	3.61 ± 0.26	1.35 ± 0.22	3.21 ± 0.31	4.57 ± 0.34	7.02 ± 0.43
RotatE	123.68 ± 1.71	87.29 ± 0.12	82.17 ± 0.20	91.53 ± 0.12	93.44 ± 0.07	95.28 ± 0.08
SimplE	384.53 ± 66.45	38.48 ± 4.00	33.93 ± 4.32	39.59 ± 4.67	42.76 ± 3.73	47.01 ± 2.66
TransD	444.39 ± 25.61	36.22 ± 0.12	3.94 ± 0.27	65.63 ± 0.55	79.64 ± 0.43	87.27 ± 0.41
TransE	468.24 ± 13.64	39.19 ± 1.21	9.99 ± 1.82	64.74 ± 0.91	75.44 ± 0.48	84.25 ± 0.33
TransH	19678.02 ± 18.92	0.18 ± 0.04	0.04 ± 0.02	0.19 ± 0.10	0.29 ± 0.14	0.39 ± 0.11
TransR	19686.49 ± 100.97	0.06 ± 0.02	0.00 ± 0.00	0.04 ± 0.02	0.05 ± 0.03	0.11 ± 0.06
TuckER	20622.46 ± 153.52	0.03 ± 0.01	0.00 ± 0.00	0.02 ± 0.01	0.03 ± 0.03	0.04 ± 0.03

TABLE X
REPRODUCTION RESULTS ON WN18RR BASED ON AN AVERAGE RANKING

	MR	MRR (%)	AMR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ConvE	5369.49 ± 50.92	44.69 ± 0.21	26.49 ± 0.25	40.98 ± 0.22	46.49 ± 0.14	48.92 ± 0.23	51.76 ± 0.13
ConvKB	13634.66 ± 714.24	0.30 ± 0.07	67.27 ± 3.52	0.09 ± 0.03	0.21 ± 0.07	0.32 ± 0.10	0.57 ± 0.16
RotatE	4263.32 ± 90.33	48.40 ± 0.09	21.03 ± 0.45	44.02 ± 0.15	50.55 ± 0.12	52.98 ± 0.11	56.51 ± 0.26

TABLE XI
REPRODUCTION RESULTS ON WN18RR BASED ON AN OPTIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ConvE	5369.49 ± 50.92	44.69 ± 0.21	40.98 ± 0.22	46.49 ± 0.14	48.92 ± 0.23	51.76 ± 0.13
ConvKB	13634.65 ± 714.24	0.30 ± 0.07	0.09 ± 0.03	0.21 ± 0.07	0.32 ± 0.10	0.57 ± 0.16
RotatE	4263.32 ± 90.33	48.40 ± 0.09	44.02 ± 0.15	50.55 ± 0.12	52.98 ± 0.11	56.51 ± 0.26

TABLE XII
REPRODUCTION RESULTS ON WN18RR BASED ON A PESSIMISTIC RANKING

	MR	MRR (%)	Hits@1 (%)	Hits@3 (%)	Hits@5 (%)	Hits@10 (%)
ConvE	5369.49 ± 50.92	44.69 ± 0.21	40.98 ± 0.22	46.49 ± 0.14	48.92 ± 0.23	51.76 ± 0.13
ConvKB	13634.65 ± 714.24	0.30 ± 0.07	0.09 ± 0.03	0.21 ± 0.07	0.32 ± 0.10	0.57 ± 0.16
RotatE	4263.32 ± 90.33	48.40 ± 0.09	44.02 ± 0.15	50.55 ± 0.12	52.98 ± 0.11	56.51 ± 0.26