SUM-QE: a BERT-based Summary Quality Estimation Model

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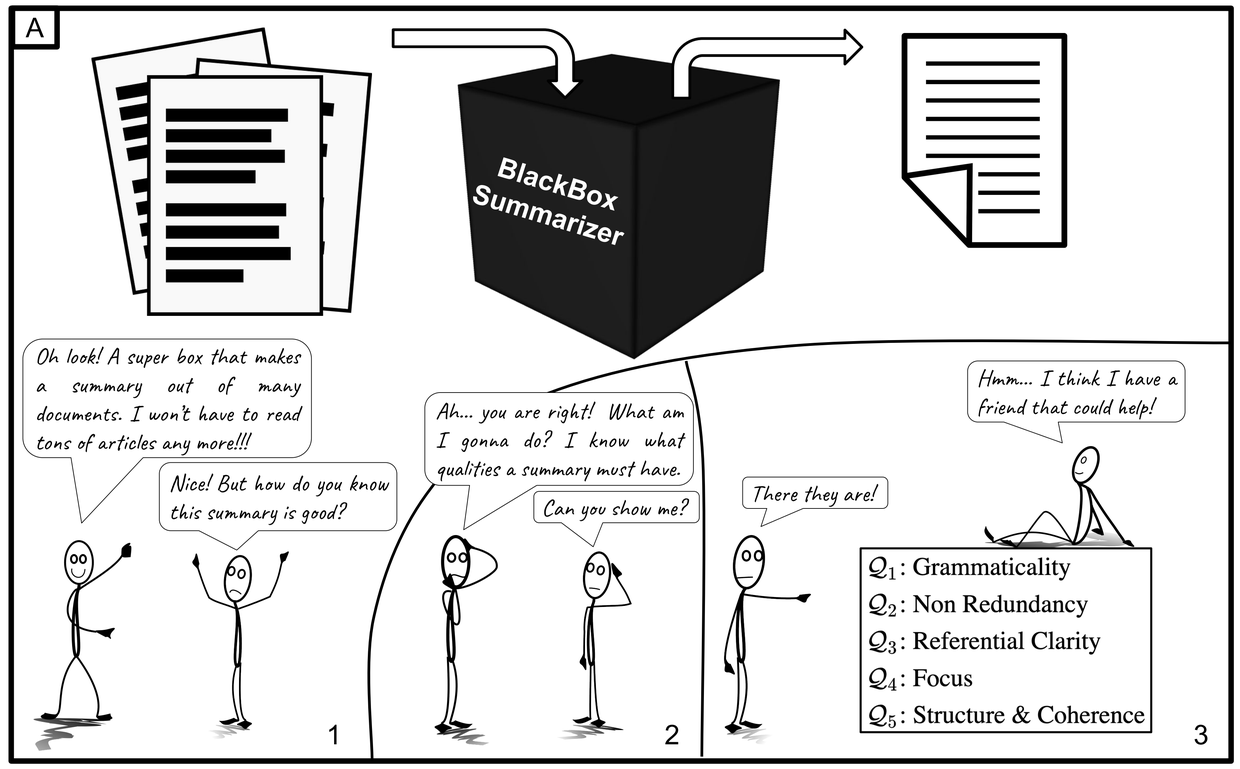

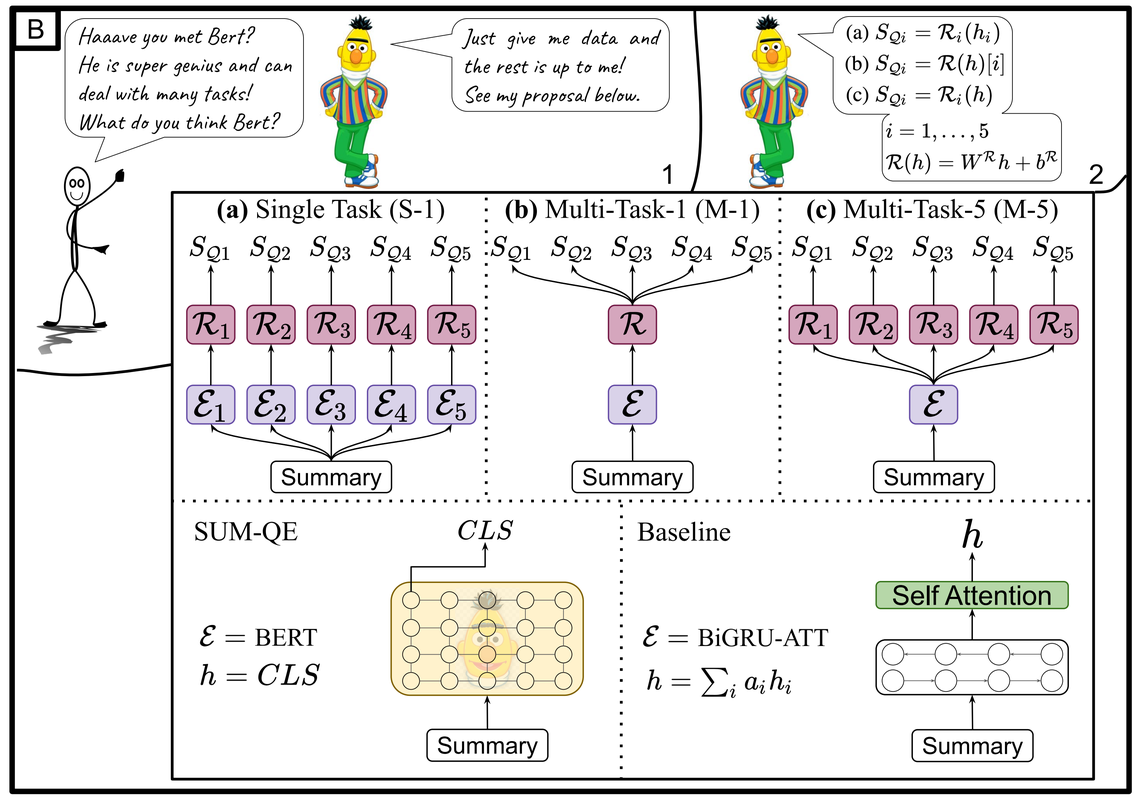

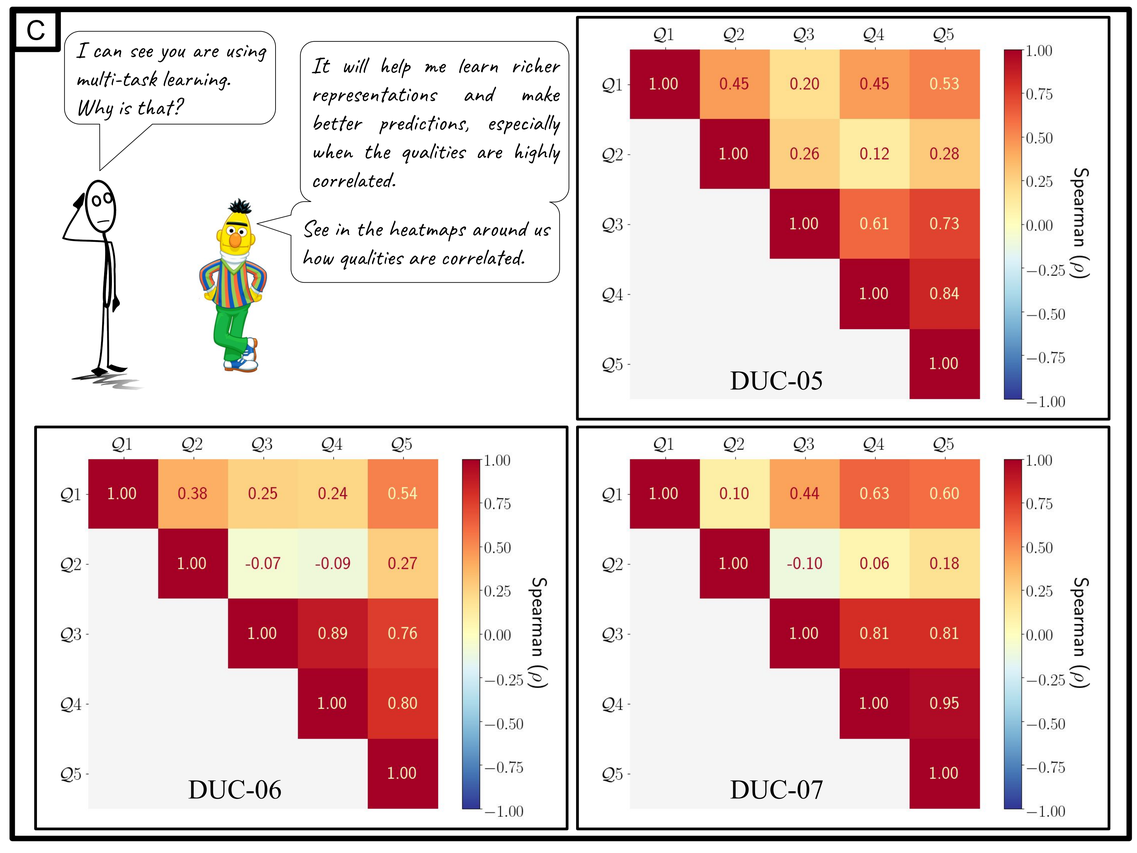

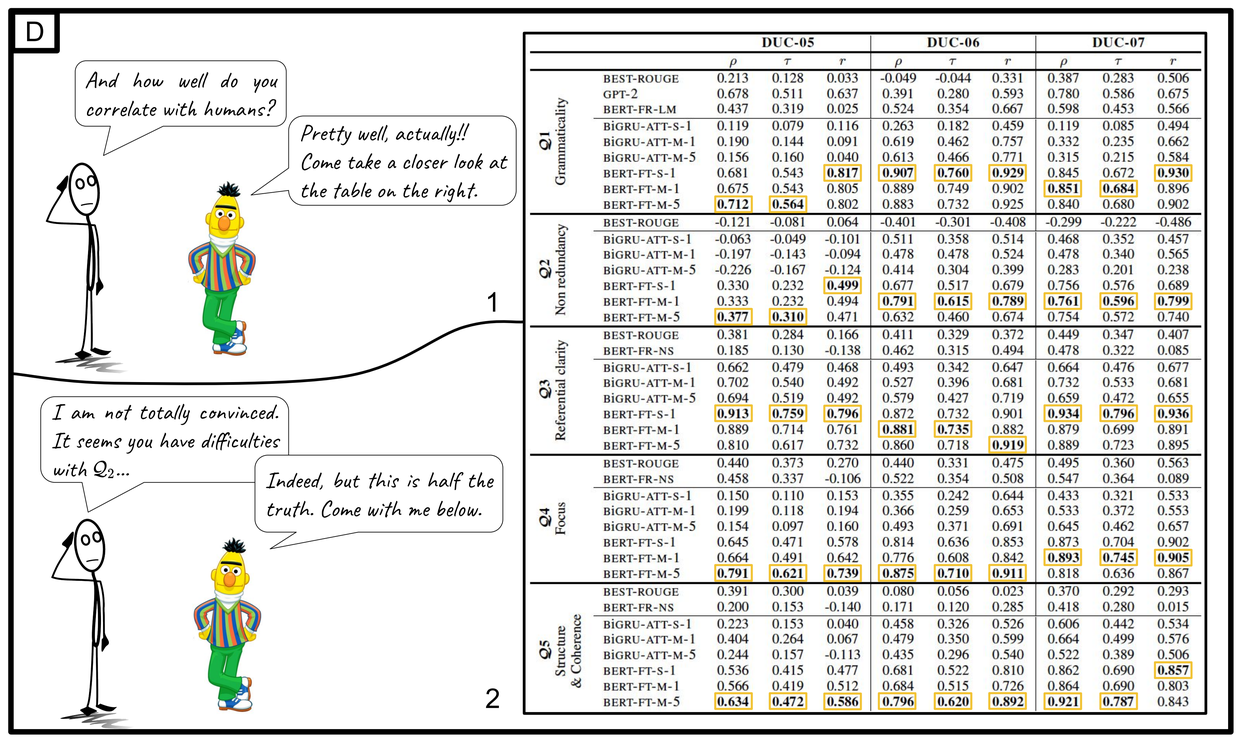

		DUC-05			DUC-06			DUC-07		
		ρ	τ	r	ρ	τ	r	ρ	τ	r
$\mathcal{Q}_1$ Grammaticality	BEST-ROUGE	0.213	0.128	0.033	-0.049	-0.044	0.331	0.387	0.283	0.506
	GPT-2	0.678	0.511	0.637	0.391	0.280	0.593	0.780	0.586	0.675
	BERT-FR-LM	0.437	0.319	0.025	0.524	0.354	0.667	0.598	0.453	0.566
	BiGRU-ATT-S-1	0.119	0.079	0.116	0.263	0.182	0.459	0.119	0.085	0.494
	BiGRU-ATT-M-1	0.190	0.144	0.091	0.619	0.462	0.757	0.332	0.235	0.662
	BiGRU-ATT-M-5	0.156	0.160	0.040	0.613	0.466	0.771	0.315	0.215	0.584
	BERT-FT-S-1	0.681	0.543	**0.817**	**0.907**	**0.760**	**0.929**	0.845	0.672	**0.930**
	BERT-FT-M-1	0.675	0.543	0.805	0.889	0.749	0.902	**0.851**	**0.684**	0.896
	BERT-FT-M-5	**0.712**	**0.564**	0.802	0.883	0.732	0.925	0.840	0.680	0.902
$\mathcal{Q}_2$ Non redundancy	BEST-ROUGE	-0.121	-0.081	0.064	-0.401	-0.301	-0.408	-0.299	-0.222	-0.486
	BiGRU-ATT-S-1	-0.063	-0.049	-0.101	0.511	0.358	0.514	0.468	0.352	0.457
	BiGRU-ATT-M-1	-0.197	-0.143	-0.094	0.478	0.478	0.524	0.478	0.340	0.565
	BiGRU-ATT-M-5	-0.226	-0.167	-0.124	0.414	0.304	0.399	0.283	0.201	0.238
	BERT-FT-S-1	0.330	0.232	**0.499**	0.677	0.517	0.679	0.756	0.576	0.689
	BERT-FT-M-1	0.333	0.232	0.494	**0.791**	**0.615**	**0.789**	**0.761**	**0.596**	**0.799**
	BERT-FT-M-5	**0.377**	**0.310**	0.471	0.632	0.460	0.674	0.754	0.572	0.740
$\mathcal{Q}_3$ Referential clarity	BEST-ROUGE	0.381	0.284	0.166	0.411	0.329	0.372	0.449	0.347	0.407
	BERT-FR-NS	0.185	0.130	-0.138	0.462	0.315	0.494	0.478	0.322	0.085
	BiGRU-ATT-S-1	0.662	0.479	0.468	0.493	0.342	0.647	0.664	0.476	0.677
	BiGRU-ATT-M-1	0.702	0.540	0.492	0.527	0.396	0.681	0.732	0.533	0.681
	BiGRU-ATT-M-5	0.694	0.519	0.492	0.579	0.427	0.719	0.659	0.472	0.655
	BERT-FT-S-1	**0.913**	**0.759**	**0.796**	0.872	0.732	0.901	**0.934**	**0.796**	**0.936**
	BERT-FT-M-1	0.889	0.714	0.761	**0.881**	**0.735**	0.882	0.879	0.699	0.891
	BERT-FT-M-5	0.810	0.617	0.732	0.860	0.718	**0.919**	0.889	0.723	0.895
$\mathcal{Q}_4$ Focus	BEST-ROUGE	0.440	0.373	0.270	0.440	0.331	0.475	0.495	0.360	0.563
	BERT-FR-NS	0.458	0.337	-0.106	0.522	0.354	0.508	0.547	0.364	0.089
	BiGRU-ATT-S-1	0.150	0.110	0.153	0.355	0.242	0.644	0.433	0.321	0.533
	BiGRU-ATT-M-1	0.199	0.118	0.194	0.366	0.259	0.653	0.533	0.372	0.553
	BiGRU-ATT-M-5	0.154	0.097	0.160	0.493	0.371	0.691	0.645	0.462	0.657
	BERT-FT-S-1	0.645	0.471	0.578	0.814	0.636	0.853	0.873	0.704	0.902
	BERT-FT-M-1	0.664	0.491	0.642	0.776	0.608	0.842	**0.893**	**0.745**	**0.905**
	BERT-FT-M-5	**0.791**	**0.621**	**0.739**	**0.875**	**0.710**	**0.911**	0.818	0.636	0.867
$\mathcal{Q}_5$ Structure & Coherence	BEST-ROUGE	0.391	0.300	0.039	0.080	0.056	0.023	0.370	0.292	0.293
	BERT-FR-NS	0.200	0.153	-0.140	0.171	0.120	0.285	0.418	0.280	0.015
	BiGRU-ATT-S-1	0.223	0.153	0.040	0.458	0.326	0.526	0.606	0.442	0.534
	BiGRU-ATT-M-1	0.404	0.264	0.067	0.479	0.350	0.599	0.664	0.499	0.576
	BiGRU-ATT-M-5	0.244	0.157	-0.113	0.435	0.296	0.540	0.522	0.389	0.506
	BERT-FT-S-1	0.536	0.415	0.477	0.681	0.522	0.810	0.862	0.690	**0.857**
	BERT-FT-M-1	0.566	0.419	0.512	0.684	0.515	0.726	0.864	0.690	0.803
	BERT-FT-M-5	**0.634**	**0.472**	**0.586**	**0.796**	**0.620**	**0.892**	**0.921**	**0.787**	0.843