

表1 GMN-9-remove_filesim ROCL															
	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	100.00%	94.74%	100.00%	100.00%	97.37%	97.37%	81.58%	91.89%	89.47%	94.59%	97.30%	84.21%	61.54%	57.89%	89.14%
preciou@2	100.00%	94.81%	100.00%	93.51%	88.31%	76.62%	48.05%	68.00%	61.84%	66.67%	62.67%	52.63%	37.18%	31.17%	70.10%
preciou@3	98.28%	89.57%	100.00%	70.69%	69.83%	54.31%	34.78%	46.02%	42.11%	45.54%	42.86%	35.09%	25.42%	20.69%	55.37%
preciou@4	95.48%	74.03%	100.00%	53.55%	53.55%	41.29%	27.27%	35.76%	32.24%	34.00%	32.00%	26.14%	19.75%	15.48%	45.75%
preciou@5	89.69%	60.10%	100.00%	43.81%	43.30%	32.99%	22.80%	28.57%	25.79%	27.27%	25.67%	20.94%	15.74%	12.44%	39.22%
recall@1	19.10%	23.68%	8.93%	36.54%	35.92%	50.00%	50.00%	55.74%	59.65%	63.64%	69.23%	69.57%	57.14%	73.33%	48.03%
recall@2	38.69%	48.03%	18.75%	69.23%	66.02%	79.73%	59.68%	83.61%	82.46%	90.91%	90.38%	86.96%	69.05%	80.00%	68.82%
recall@3	57.29%	67.76%	28.57%	78.85%	78.64%	85.14%	64.52%	85.25%	84.21%	92.73%	92.31%	86.96%	71.43%	80.00%	75.26%
recall@4	74.37%	75.00%	38.39%	79.81%	80.58%	86.49%	67.74%	88.52%	85.96%	92.73%	92.31%	86.96%	73.81%	80.00%	78.76%
recall@5	87.44%	76.32%	48.21%	81.73%	81.55%	86.49%	70.97%	88.52%	85.96%	92.73%	92.31%	86.96%	73.81%	80.00%	80.93%
f1-score@1	32.07%	37.89%	16.39%	53.52%	52.48%	66.07%	62.00%	69.39%	71.58%	76.09%	80.90%	76.19%	59.26%	64.71%	62.43%
f1-score@2	55.80%	63.76%	31.58%	79.56%	75.56%	78.15%	53.24%	75.00%	70.68%	76.92%	74.02%	65.57%	48.33%	44.86%	69.46%
f1-score@3	72.38%	77.15%	44.44%	74.55%	73.97%	66.32%	45.20%	59.77%	56.14%	61.08%	58.54%	50.00%	37.50%	32.88%	63.80%
f1-score@4	83.62%	74.51%	55.48%	64.09%	64.34%	55.90%	38.89%	50.94%	46.89%	49.76%	47.52%	40.20%	31.16%	25.95%	57.88%
f1-score@5	88.55%	67.25%	65.06%	57.05%	56.57%	47.76%	34.51%	43.20%	39.68%	42.15%	40.17%	33.76%	25.94%	21.52%	52.84%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	100.00%	90.07%	100.00%	100.00%	97.15%	96.76%	75.98%	85.56%	81.26%	84.12%	97.30%	79.90%	54.76%	49.60%	85.17%
MAP@2	100.00%	89.88%	100.00%	93.26%	86.13%	73.89%	42.71%	62.08%	54.46%	58.71%	61.79%	48.31%	30.77%	25.46%	66.25%
MAP@3	97.87%	84.66%	100.00%	69.38%	66.22%	51.57%	29.64%	41.68%	36.71%	39.87%	41.87%	32.21%	20.64%	16.90%	52.09%
MAP@4	94.53%	69.49%	100.00%	52.38%	50.38%	38.88%	22.53%	31.75%	27.76%	29.77%	31.26%	24.00%	15.68%	12.65%	42.93%
MAP@5	88.12%	56.08%	100.00%	42.36%	40.52%	31.06%	18.23%	25.36%	22.21%	23.88%	25.08%	19.22%	12.49%	10.16%	36.77%

表2 GMN-9-remove_filelen NOCL															
	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	97.37%	92.11%	100.00%	100.00%	92.11%	94.74%	76.32%	94.59%	92.11%	91.89%	94.59%	76.32%	51.28%	47.37%	85.77%
preciou@2	94.81%	93.51%	100.00%	94.81%	92.21%	74.03%	48.05%	68.00%	63.16%	68.00%	61.33%	51.32%	34.62%	27.27%	69.36%
preciou@3	93.97%	89.57%	96.88%	78.45%	71.55%	51.72%	37.39%	46.02%	43.86%	46.43%	41.96%	35.09%	26.27%	19.83%	55.64%
preciou@4	90.32%	74.03%	95.35%	61.94%	55.48%	40.65%	29.87%	35.76%	33.55%	35.33%	31.33%	26.80%	20.38%	14.84%	46.12%
preciou@5	86.60%	61.14%	96.30%	50.52%	44.33%	32.99%	24.35%	29.10%	26.84%	28.88%	25.13%	21.47%	16.75%	12.44%	39.77%
recall@1	18.59%	23.03%	8.93%	36.54%	33.98%	48.65%	46.77%	57.38%	61.40%	61.82%	67.31%	63.04%	47.62%	60.00%	45.36%
recall@2	36.68%	47.37%	18.75%	70.19%	68.93%	77.03%	59.68%	83.61%	84.21%	92.73%	88.46%	84.78%	64.29%	70.00%	67.62%
recall@3	54.77%	67.76%	27.68%	87.50%	80.58%	81.08%	69.35%	85.25%	87.72%	94.55%	90.38%	86.96%	73.81%	76.67%	76.00%
recall@4	70.35%	75.00%	36.61%	92.31%	83.50%	85.14%	74.19%	88.52%	89.47%	96.36%	90.38%	89.13%	76.19%	76.67%	80.27%
recall@5	84.42%	77.63%	46.43%	94.23%	83.50%	86.49%	75.81%	90.16%	89.47%	98.18%	90.38%	89.13%	78.57%	80.00%	83.17%
f1-score@1	31.22%	36.84%	16.39%	53.52%	49.65%	64.29%	58.00%	71.43%	73.68%	73.91%	78.65%	69.05%	49.38%	52.94%	59.34%
f1-score@2	52.90%	62.88%	31.58%	80.66%	78.89%	75.50%	53.24%	75.00%	72.18%	78.46%	72.44%	63.93%	45.00%	39.25%	68.48%
f1-score@3	69.21%	77.15%	43.06%	82.73%	75.80%	63.16%	48.59%	59.77%	58.48%	62.28%	57.32%	50.00%	38.75%	31.51%	64.25%
f1-score@4	79.10%	74.51%	52.90%	74.13%	66.67%	55.02%	42.59%	50.94%	48.80%	51.71%	46.53%	41.21%	32.16%	24.86%	58.58%
f1-score@5	85.50%	68.41%	62.65%	65.77%	57.91%	47.76%	36.86%	44.00%	41.30%	44.63%	39.33%	34.60%	27.62%	21.52%	53.81%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	97.08%	87.61%	100.00%	100.00%	81.63%	84.20%	74.33%	92.61%	80.64%	86.91%	92.21%	71.81%	38.53%	41.68%	80.66%
MAP@2	92.25%	88.25%	100.00%	94.30%	83.89%	65.16%	43.87%	64.22%	55.01%	60.82%	57.12%	45.23%	23.36%	21.96%	63.96%
MAP@3	90.35%	83.85%	96.12%	76.78%	64.26%	44.97%	31.53%	43.14%	37.63%	41.33%	38.69%	30.56%	16.54%	14.96%	50.76%
MAP@4	86.08%	68.61%	94.05%	59.77%	49.26%	34.58%	24.19%	32.79%	28.45%	31.10%	28.89%	23.00%	12.59%	11.20%	41.75%
MAP@5	81.54%	56.25%	94.43%	48.39%	39.35%	27.80%	19.45%	26.39%	22.76%	25.13%	23.18%	18.42%	10.12%	9.07%	35.88%

表3 GMN-9-remove_code1 PC

	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	84.21%	97.30%	97.37%	91.89%	97.30%	81.58%	71.79%	55.26%	91.19%
preciou@2	98.70%	96.10%	100.00%	93.51%	96.10%	76.62%	49.35%	69.33%	59.21%	65.33%	62.67%	51.32%	41.03%	29.87%	70.65%
preciou@3	96.55%	91.30%	100.00%	73.28%	75.86%	53.45%	35.65%	47.79%	42.98%	43.75%	42.86%	34.21%	27.12%	20.69%	56.11%
preciou@4	90.32%	75.97%	100.00%	58.06%	57.42%	40.00%	27.27%	35.76%	32.89%	34.00%	32.00%	25.49%	22.29%	16.13%	46.26%
preciou@5	85.05%	62.18%	98.15%	46.39%	45.88%	32.99%	22.80%	29.10%	26.32%	27.27%	25.67%	20.42%	17.77%	12.95%	39.49%
recall@1	19.10%	25.00%	8.93%	36.54%	36.89%	51.35%	51.61%	59.02%	64.91%	61.82%	69.23%	67.39%	66.67%	70.00%	49.18%
recall@2	38.19%	48.68%	18.75%	69.23%	71.84%	79.73%	61.29%	85.25%	78.95%	89.09%	90.38%	84.78%	76.19%	76.67%	69.22%
recall@3	56.28%	69.08%	28.57%	81.73%	85.44%	83.78%	66.13%	88.52%	85.96%	89.09%	92.31%	84.78%	76.19%	80.00%	76.28%
recall@4	70.35%	76.97%	38.39%	86.54%	86.41%	83.78%	67.74%	88.52%	87.72%	92.73%	92.31%	84.78%	83.33%	83.33%	80.21%
recall@5	82.91%	78.95%	47.32%	86.54%	86.41%	86.49%	70.97%	90.16%	87.72%	92.73%	92.31%	84.78%	83.33%	83.33%	82.43%
f1-score@1	32.07%	40.00%	16.39%	53.52%	53.90%	67.86%	64.00%	73.47%	77.89%	73.91%	80.90%	73.81%	69.14%	61.76%	63.90%
f1-score@2	55.07%	64.63%	31.58%	79.56%	82.22%	78.15%	54.68%	76.47%	67.67%	75.38%	74.02%	63.93%	53.33%	42.99%	69.93%
f1-score@3	71.11%	78.65%	44.44%	77.27%	80.37%	65.26%	46.33%	62.07%	57.31%	58.68%	58.54%	48.75%	40.00%	32.88%	64.66%
f1-score@4	79.10%	76.47%	55.48%	69.50%	68.99%	54.15%	38.89%	50.94%	47.85%	49.76%	47.52%	39.20%	35.18%	27.03%	58.68%
f1-score@5	83.97%	69.57%	63.86%	60.40%	59.93%	47.76%	34.51%	44.00%	40.49%	42.15%	40.17%	32.91%	29.29%	22.42%	53.40%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	83.26%	97.15%	92.25%	87.11%	95.08%	74.31%	68.93%	46.30%	88.88%
MAP@2	98.40%	95.27%	100.00%	92.73%	95.43%	75.32%	46.60%	66.91%	54.56%	60.62%	60.95%	44.96%	37.55%	23.67%	68.07%
MAP@3	95.36%	89.54%	100.00%	71.80%	74.58%	51.82%	32.38%	45.61%	38.23%	40.59%	41.20%	29.97%	24.82%	15.97%	53.71%
MAP@4	88.30%	73.80%	100.00%	55.97%	56.29%	38.78%	24.41%	34.13%	28.93%	30.84%	30.76%	22.33%	19.16%	12.08%	43.99%
MAP@5	81.94%	59.92%	98.01%	44.72%	44.97%	31.36%	19.76%	27.44%	23.15%	24.73%	24.67%	17.89%	15.27%	9.70%	37.40%

表4 GMN-9-remove_code2 PCOCF															
	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	100.00%	97.37%	100.00%	97.37%	100.00%	97.37%	76.32%	97.30%	94.74%	94.59%	97.30%	81.58%	61.54%	55.26%	89.34%
preciou@2	98.70%	85.71%	100.00%	96.10%	90.91%	72.73%	48.05%	73.33%	61.84%	66.67%	62.67%	53.95%	35.90%	32.47%	69.93%
preciou@3	97.41%	80.87%	100.00%	79.31%	70.69%	50.00%	34.78%	49.56%	42.11%	46.43%	42.86%	36.84%	25.42%	22.41%	55.62%
preciou@4	94.84%	70.13%	100.00%	61.29%	55.48%	38.06%	29.22%	37.09%	32.24%	34.67%	32.67%	27.45%	19.11%	17.42%	46.40%
preciou@5	87.63%	58.55%	98.15%	50.52%	45.36%	30.93%	23.32%	29.63%	25.79%	27.81%	26.20%	21.99%	15.74%	13.99%	39.69%
recall@1	19.10%	24.34%	8.93%	35.58%	36.89%	50.00%	46.77%	59.02%	63.16%	63.64%	69.23%	67.39%	57.14%	70.00%	47.94%
recall@2	38.19%	43.42%	18.75%	71.15%	67.96%	75.68%	59.68%	90.16%	82.46%	90.91%	90.38%	89.13%	66.67%	83.33%	69.13%
recall@3	56.78%	61.18%	28.57%	88.46%	79.61%	78.38%	64.52%	91.80%	84.21%	94.55%	92.31%	91.30%	71.43%	86.67%	76.41%
recall@4	73.87%	71.05%	38.39%	91.35%	83.50%	79.73%	72.58%	91.80%	85.96%	94.55%	94.23%	91.30%	71.43%	90.00%	80.70%
recall@5	85.43%	74.34%	47.32%	94.23%	85.44%	81.08%	72.58%	91.80%	85.96%	94.55%	94.23%	91.30%	73.81%	90.00%	83.01%
f1-score@1	32.07%	38.95%	16.39%	52.11%	53.90%	66.07%	58.00%	73.47%	75.79%	76.09%	80.90%	73.81%	59.26%	61.76%	62.40%
f1-score@2	55.07%	57.64%	31.58%	81.77%	77.78%	74.17%	53.24%	80.88%	70.68%	76.92%	74.02%	67.21%	46.67%	46.73%	69.53%
f1-score@3	71.75%	69.66%	44.44%	83.64%	74.89%	61.05%	45.20%	64.37%	56.14%	62.28%	58.54%	52.50%	37.50%	35.62%	64.38%
f1-score@4	83.05%	70.59%	55.48%	73.36%	66.67%	51.53%	41.67%	52.83%	46.89%	50.73%	48.51%	42.21%	30.15%	29.19%	58.92%
f1-score@5	86.51%	65.51%	63.86%	65.77%	59.26%	44.78%	35.29%	44.80%	39.68%	42.98%	41.00%	35.44%	25.94%	24.22%	53.70%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	100.00%	93.39%	100.00%	97.08%	100.00%	94.80%	73.71%	96.91%	89.16%	87.69%	97.22%	76.67%	52.61%	52.15%	86.53%
MAP@2	98.63%	80.63%	100.00%	94.65%	89.51%	68.60%	43.73%	70.31%	57.33%	59.82%	60.20%	48.66%	28.91%	28.29%	66.38%
MAP@3	96.66%	73.66%	100.00%	77.19%	67.97%	46.73%	30.29%	47.12%	38.71%	41.16%	40.86%	32.80%	19.55%	19.06%	52.27%
MAP@4	93.43%	62.41%	100.00%	59.18%	52.43%	35.24%	23.60%	35.26%	29.29%	30.73%	30.74%	24.44%	14.69%	14.41%	43.27%
MAP@5	85.82%	51.43%	97.85%	48.16%	42.41%	28.33%	18.83%	28.17%	23.44%	24.65%	24.66%	19.57%	11.81%	11.57%	36.91%

表5 GMN-9-remove local ROCF															
	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	92.11%	89.47%	90.00%	94.74%	92.11%	84.21%	84.21%	94.59%	89.47%	83.78%	75.68%	81.58%	61.54%	57.89%	83.67%
preciou@2	94.81%	89.61%	90.48%	96.10%	90.91%	72.73%	51.95%	69.33%	61.84%	64.00%	62.67%	51.32%	38.46%	32.47%	69.05%
preciou@3	94.83%	86.09%	93.75%	77.59%	74.14%	51.72%	37.39%	48.67%	42.98%	44.64%	43.75%	35.09%	27.12%	22.41%	55.73%
preciou@4	94.19%	75.97%	95.35%	59.35%	57.42%	40.00%	28.57%	36.42%	32.89%	33.33%	32.67%	26.80%	21.02%	16.77%	46.48%
preciou@5	90.72%	61.66%	96.30%	47.94%	45.88%	33.51%	22.80%	29.10%	26.84%	27.81%	26.20%	21.47%	16.75%	13.47%	40.03%
recall@1	17.59%	22.37%	8.04%	34.62%	33.98%	43.24%	51.61%	57.38%	59.65%	56.36%	53.85%	67.39%	57.14%	73.33%	45.47%
recall@2	36.68%	45.39%	16.96%	71.15%	67.96%	75.68%	64.52%	85.25%	82.46%	87.27%	90.38%	84.78%	71.43%	83.33%	68.80%
recall@3	55.28%	65.13%	26.79%	86.54%	83.50%	81.08%	69.35%	90.16%	85.96%	90.91%	94.23%	86.96%	76.19%	86.67%	77.05%
recall@4	73.37%	76.97%	36.61%	88.46%	86.41%	83.78%	70.97%	90.16%	87.72%	90.91%	94.23%	89.13%	78.57%	86.67%	81.00%
recall@5	88.44%	78.29%	46.43%	89.42%	86.41%	87.84%	70.97%	90.16%	89.47%	94.55%	94.23%	89.13%	78.57%	86.67%	83.61%
f1-score@1	29.54%	35.79%	14.75%	50.70%	49.65%	57.14%	64.00%	71.43%	71.58%	67.39%	62.92%	73.81%	59.26%	64.71%	58.92%
f1-score@2	52.90%	60.26%	28.57%	81.77%	77.78%	74.17%	57.55%	76.47%	70.68%	73.85%	74.02%	63.93%	50.00%	46.73%	68.93%
f1-score@3	69.84%	74.16%	41.67%	81.82%	78.54%	63.16%	48.59%	63.22%	57.31%	59.88%	59.76%	50.00%	40.00%	35.62%	64.68%
f1-score@4	82.49%	76.47%	52.90%	71.04%	68.99%	54.15%	40.74%	51.89%	47.85%	48.78%	48.51%	41.21%	33.17%	28.11%	59.07%
f1-score@5	89.57%	68.99%	62.65%	62.42%	59.93%	48.51%	34.51%	44.00%	41.30%	42.98%	41.00%	34.60%	27.62%	23.32%	54.14%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	100.00%	100.00%	100.00%	100.00%	96.43%
MAP@1	88.44%	79.75%	89.00%	93.76%	90.40%	75.39%	81.11%	92.06%	88.82%	64.94%	65.66%	69.78%	49.17%	45.06%	76.67%
MAP@2	90.06%	80.44%	86.82%	93.82%	85.94%	63.00%	46.34%	65.79%	57.81%	50.50%	52.28%	42.68%	28.68%	23.84%	62.00%
MAP@3	90.06%	76.72%	88.77%	74.80%	68.95%	44.10%	32.17%	45.22%	39.60%	34.94%	35.98%	28.87%	19.57%	16.05%	49.70%
MAP@4	89.45%	67.17%	90.28%	56.89%	52.88%	33.66%	24.26%	33.84%	29.92%	26.09%	26.86%	21.73%	14.86%	12.01%	41.42%
MAP@5	85.79%	54.25%	91.43%	45.71%	42.25%	27.46%	19.36%	27.04%	24.09%	21.28%	21.55%	17.41%	11.84%	9.65%	35.65%

表6 GMN-9-remove loca2 NOCF

	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	97.37%	94.74%	100.00%	100.00%	100.00%	100.00%	86.84%	100.00%	100.00%	94.59%	97.30%	86.84%	69.23%	42.11%	90.64%
preciou@2	97.40%	97.40%	100.00%	100.00%	94.81%	75.32%	50.65%	74.67%	67.11%	66.67%	62.67%	50.00%	38.46%	23.38%	71.32%
preciou@3	96.55%	93.04%	100.00%	75.86%	73.28%	54.31%	36.52%	49.56%	44.74%	47.32%	41.96%	34.21%	25.42%	16.38%	56.37%
preciou@4	93.55%	74.68%	100.00%	57.42%	56.77%	41.94%	28.57%	37.09%	35.53%	35.33%	31.33%	26.14%	20.38%	12.90%	46.55%
preciou@5	87.11%	61.14%	100.00%	47.94%	46.91%	34.54%	23.32%	30.16%	28.42%	28.34%	25.13%	21.47%	16.75%	10.36%	40.11%
recall@1	18.59%	23.68%	8.93%	36.54%	36.89%	51.35%	53.23%	60.66%	66.67%	63.64%	69.23%	71.74%	64.29%	53.33%	48.48%
recall@2	37.69%	49.34%	18.75%	74.04%	70.87%	78.38%	62.90%	91.80%	89.47%	90.91%	90.38%	82.61%	71.43%	60.00%	69.18%
recall@3	56.28%	70.39%	28.57%	84.62%	82.52%	85.14%	67.74%	91.80%	89.47%	96.36%	90.38%	84.78%	71.43%	63.33%	75.92%
recall@4	72.86%	75.66%	38.39%	85.58%	85.44%	87.84%	70.97%	91.80%	94.74%	96.36%	90.38%	86.96%	76.19%	66.67%	79.99%
recall@5	84.92%	77.63%	48.21%	89.42%	88.35%	90.54%	72.58%	93.44%	94.74%	96.36%	90.38%	89.13%	78.57%	66.67%	82.93%
f1-score@1	31.22%	37.89%	16.39%	53.52%	53.90%	67.86%	66.00%	75.51%	80.00%	76.09%	80.90%	78.57%	66.67%	47.06%	63.18%
f1-score@2	54.35%	65.50%	31.58%	85.08%	81.11%	76.82%	56.12%	82.35%	76.69%	76.92%	74.02%	62.30%	50.00%	33.64%	70.24%
f1-score@3	71.11%	80.15%	44.44%	80.00%	77.63%	66.32%	47.46%	64.37%	59.65%	63.47%	57.32%	48.75%	37.50%	26.03%	64.70%
f1-score@4	81.92%	75.16%	55.48%	68.73%	68.22%	56.77%	40.74%	52.83%	51.67%	51.71%	46.53%	40.20%	32.16%	21.62%	58.85%
f1-score@5	86.01%	68.41%	65.06%	62.42%	61.28%	50.00%	35.29%	45.60%	43.72%	43.80%	39.33%	34.60%	27.62%	17.94%	54.07%
MRR	50.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.43%
MAP@1	88.87%	92.52%	100.00%	100.00%	100.00%	100.00%	85.54%	100.00%	100.00%	93.88%	97.30%	84.87%	66.74%	40.64%	89.31%
MAP@2	91.94%	94.49%	100.00%	100.00%	94.66%	73.89%	47.73%	73.68%	64.91%	65.39%	62.11%	47.46%	35.07%	20.80%	69.44%
MAP@3	91.99%	90.08%	100.00%	75.25%	72.43%	52.11%	33.08%	48.91%	43.28%	45.30%	41.59%	32.03%	23.18%	14.01%	54.52%
MAP@4	89.18%	71.86%	100.00%	56.77%	55.37%	39.65%	25.13%	36.60%	33.20%	33.83%	31.05%	24.04%	17.69%	10.57%	44.64%
MAP@5	82.63%	58.47%	100.00%	46.46%	45.00%	32.06%	20.19%	29.41%	26.56%	27.13%	24.91%	19.37%	14.18%	8.49%	38.21%

表7 GMN-9-remove_pattern REF															
	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	89.47%	92.11%	100.00%	94.74%	97.37%	86.84%	81.58%	97.30%	92.11%	89.19%	86.49%	76.32%	61.54%	52.63%	85.55%
preciou@2	89.61%	89.61%	100.00%	94.81%	93.51%	72.73%	48.05%	70.67%	63.16%	65.33%	65.33%	50.00%	37.18%	32.47%	69.46%
preciou@3	90.52%	88.70%	100.00%	80.17%	74.14%	52.59%	33.91%	51.33%	42.98%	45.54%	43.75%	35.09%	26.27%	21.55%	56.18%
preciou@4	88.39%	74.68%	97.67%	61.29%	56.13%	40.65%	26.62%	38.41%	32.24%	34.00%	32.67%	26.14%	20.38%	16.13%	46.10%
preciou@5	85.57%	60.62%	98.15%	48.97%	46.91%	32.47%	21.24%	30.69%	25.79%	27.81%	26.20%	20.94%	16.75%	12.95%	39.65%
recall@1	17.09%	23.03%	8.93%	34.62%	35.92%	44.59%	50.00%	59.02%	61.40%	60.00%	61.54%	63.04%	57.14%	66.67%	45.93%
recall@2	34.67%	45.39%	18.75%	70.19%	69.90%	75.68%	59.68%	86.89%	84.21%	89.09%	94.23%	82.61%	69.05%	83.33%	68.83%
recall@3	52.76%	67.11%	28.57%	89.42%	83.50%	82.43%	62.90%	95.08%	85.96%	92.73%	94.23%	86.96%	73.81%	83.33%	77.06%
recall@4	68.84%	75.66%	37.50%	91.35%	84.47%	85.14%	66.13%	95.08%	85.96%	92.73%	94.23%	86.96%	76.19%	83.33%	80.25%
recall@5	83.42%	76.97%	47.32%	91.35%	88.35%	85.14%	66.13%	95.08%	85.96%	94.55%	94.23%	86.96%	78.57%	83.33%	82.67%
f1-score@1	28.69%	36.84%	16.39%	50.70%	52.48%	58.93%	62.00%	73.47%	73.68%	71.74%	71.91%	69.05%	59.26%	58.82%	59.77%
f1-score@2	50.00%	60.26%	31.58%	80.66%	80.00%	74.17%	53.24%	77.94%	72.18%	75.38%	77.17%	62.30%	48.33%	46.73%	69.15%
f1-score@3	66.67%	76.40%	44.44%	84.55%	78.54%	64.21%	44.07%	66.67%	57.31%	61.08%	59.76%	50.00%	38.75%	34.25%	64.98%
f1-score@4	77.40%	75.16%	54.19%	73.36%	67.44%	55.02%	37.96%	54.72%	46.89%	49.76%	48.51%	40.20%	32.16%	27.03%	58.56%
f1-score@5	84.48%	67.83%	63.86%	63.76%	61.28%	47.01%	32.16%	46.40%	39.68%	42.98%	41.00%	33.76%	27.62%	22.42%	53.59%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	84.81%	80.24%	100.00%	90.68%	96.07%	73.14%	80.58%	94.33%	82.71%	76.56%	72.20%	68.85%	52.82%	44.65%	78.40%
MAP@2	82.00%	79.55%	100.00%	90.48%	91.73%	60.42%	45.52%	66.56%	56.28%	55.75%	54.79%	42.81%	29.23%	24.99%	62.86%
MAP@3	82.27%	78.73%	100.00%	75.32%	71.91%	42.89%	31.18%	46.71%	38.06%	38.49%	36.69%	29.37%	19.80%	16.59%	50.57%
MAP@4	80.22%	65.86%	97.07%	57.29%	54.21%	32.68%	23.67%	34.96%	28.55%	28.74%	27.39%	21.88%	15.03%	12.41%	41.43%
MAP@5	77.04%	53.27%	97.25%	45.78%	44.35%	26.11%	18.89%	27.93%	22.84%	23.20%	21.97%	17.53%	12.07%	9.97%	35.58%

表8 GMN-9-remove_time TIME

	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	97.37%	100.00%	100.00%	100.00%	100.00%	97.37%	71.05%	94.59%	89.47%	91.89%	94.59%	81.58%	61.54%	42.11%	87.25%
preciou@2	98.70%	97.40%	100.00%	93.51%	87.01%	79.22%	44.16%	65.33%	61.84%	68.00%	61.33%	48.68%	33.33%	22.08%	68.61%
preciou@3	99.14%	88.70%	100.00%	73.28%	59.48%	52.59%	33.91%	46.90%	41.23%	46.43%	41.07%	34.21%	23.73%	14.66%	53.95%
preciou@4	99.35%	71.43%	97.67%	57.42%	47.10%	40.65%	26.62%	35.10%	31.58%	34.67%	31.33%	25.49%	19.11%	11.61%	44.94%
preciou@5	89.69%	60.10%	98.15%	46.39%	37.63%	32.99%	21.24%	28.04%	25.79%	27.81%	25.13%	20.42%	15.23%	9.33%	38.42%
recall@1	18.59%	25.00%	8.93%	36.54%	36.89%	50.00%	43.55%	57.38%	59.65%	61.82%	67.31%	67.39%	57.14%	53.33%	45.97%
recall@2	38.19%	49.34%	18.75%	69.23%	65.05%	82.43%	54.84%	80.33%	82.46%	92.73%	88.46%	80.43%	61.90%	56.67%	65.77%
recall@3	57.79%	67.11%	28.57%	81.73%	66.99%	82.43%	62.90%	86.89%	82.46%	94.55%	88.46%	84.78%	66.67%	56.67%	72.00%
recall@4	77.39%	72.37%	37.50%	85.58%	70.87%	85.14%	66.13%	86.89%	84.21%	94.55%	90.38%	84.78%	71.43%	60.00%	76.23%
recall@5	87.44%	76.32%	47.32%	86.54%	70.87%	86.49%	66.13%	86.89%	85.96%	94.55%	90.38%	84.78%	71.43%	60.00%	78.22%
f1-score@1	31.22%	40.00%	16.39%	53.52%	53.90%	66.07%	54.00%	71.43%	71.58%	73.91%	78.65%	73.81%	59.26%	47.06%	60.21%
f1-score@2	55.07%	65.50%	31.58%	79.56%	74.44%	80.79%	48.92%	72.06%	70.68%	78.46%	72.44%	60.66%	43.33%	31.78%	67.16%
f1-score@3	73.02%	76.40%	44.44%	77.27%	63.01%	64.21%	44.07%	60.92%	54.97%	62.28%	56.10%	48.75%	35.00%	23.29%	61.68%
f1-score@4	87.01%	71.90%	54.19%	68.73%	56.59%	55.02%	37.96%	50.00%	45.93%	50.73%	46.53%	39.20%	30.15%	19.46%	56.54%
f1-score@5	88.55%	67.25%	63.86%	60.40%	49.16%	47.76%	32.16%	42.40%	39.68%	42.98%	39.33%	32.91%	25.10%	16.14%	51.53%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	96.18%	100.00%	100.00%	100.00%	100.00%	93.69%	70.24%	91.84%	89.20%	90.41%	91.98%	78.22%	52.90%	38.04%	85.19%
MAP@2	97.21%	97.33%	100.00%	93.34%	86.57%	73.90%	39.86%	62.59%	58.14%	63.93%	58.35%	44.22%	27.72%	19.16%	65.88%
MAP@3	97.79%	87.16%	100.00%	71.37%	58.83%	49.05%	28.54%	43.37%	38.76%	43.29%	39.07%	30.16%	18.81%	12.72%	51.35%
MAP@4	98.16%	69.33%	97.33%	55.25%	45.51%	37.35%	21.72%	32.46%	29.33%	32.32%	29.42%	22.47%	14.44%	9.59%	42.48%
MAP@5	88.09%	57.31%	97.46%	44.43%	36.36%	30.04%	17.33%	25.93%	23.60%	25.93%	23.60%	18.00%	11.51%	7.70%	36.23%

表9 GMN-9-remove_all_rm_nontext															
	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	44.74%	44.74%	80.00%	55.26%	26.32%	28.95%	31.58%	16.22%	18.42%	27.03%	24.32%	23.68%	0.00%	7.89%	30.65%
preciou@2	41.56%	27.27%	80.95%	40.26%	18.18%	18.18%	22.08%	9.33%	13.16%	17.33%	16.00%	15.79%	1.28%	5.19%	23.33%
preciou@3	31.90%	26.09%	68.75%	31.03%	18.10%	13.79%	17.39%	7.96%	12.28%	15.18%	12.50%	11.40%	4.24%	3.45%	19.58%
preciou@4	27.74%	22.08%	65.12%	24.52%	16.13%	10.97%	14.29%	6.62%	9.87%	12.67%	10.00%	9.15%	4.46%	2.58%	16.87%
preciou@5	25.26%	19.17%	59.26%	21.65%	14.43%	10.82%	11.40%	7.94%	8.95%	11.76%	8.02%	9.42%	4.57%	2.59%	15.37%
recall@1	8.54%	11.18%	7.14%	20.19%	9.71%	14.86%	19.35%	9.84%	12.28%	18.18%	17.31%	19.57%	0.00%	10.00%	12.73%
recall@2	16.08%	13.82%	15.18%	29.81%	13.59%	18.92%	27.42%	11.48%	17.54%	23.64%	23.08%	26.09%	2.38%	13.33%	18.02%
recall@3	18.59%	19.74%	19.64%	34.62%	20.39%	21.62%	32.26%	14.75%	24.56%	30.91%	26.92%	28.26%	11.90%	13.33%	22.68%
recall@4	21.61%	22.37%	25.00%	36.54%	24.27%	22.97%	35.48%	16.39%	26.32%	34.55%	28.85%	30.43%	16.67%	13.33%	25.34%
recall@5	24.62%	24.34%	28.57%	40.38%	27.18%	28.38%	35.48%	24.59%	29.82%	40.00%	28.85%	39.13%	21.43%	16.67%	29.25%
f1-score@1	14.35%	17.89%	13.11%	29.58%	14.18%	19.64%	24.00%	12.24%	14.74%	21.74%	20.22%	21.43%	#DIV/0!	8.82%	17.99%
f1-score@2	23.19%	18.34%	25.56%	34.25%	15.56%	18.54%	24.46%	10.29%	15.04%	20.00%	18.90%	19.67%	1.67%	7.48%	20.34%
f1-score@3	23.49%	22.47%	30.56%	32.73%	19.18%	16.84%	22.60%	10.34%	16.37%	20.36%	17.07%	16.25%	6.25%	5.48%	21.01%
f1-score@4	24.29%	22.22%	36.13%	29.34%	19.38%	14.85%	20.37%	9.43%	14.35%	18.54%	14.85%	14.07%	7.04%	4.32%	20.26%
f1-score@5	24.94%	21.45%	38.55%	28.19%	18.86%	15.67%	17.25%	12.00%	13.77%	18.18%	12.55%	15.19%	7.53%	4.48%	20.15%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	33.33%	100.00%	100.00%	50.00%	100.00%	1.54%	16.67%	78.68%
MAP@1	33.65%	29.89%	74.35%	47.33%	17.76%	16.83%	24.25%	3.99%	9.51%	18.34%	12.25%	10.01%	0.00%	0.79%	21.35%
MAP@2	24.78%	16.56%	71.96%	29.37%	9.99%	9.31%	13.85%	2.18%	5.48%	9.82%	6.89%	5.67%	0.02%	0.47%	14.74%
MAP@3	17.92%	13.24%	59.72%	21.09%	7.64%	6.46%	9.82%	1.60%	4.10%	7.20%	4.87%	3.90%	0.12%	0.32%	11.29%
MAP@4	14.52%	10.52%	53.33%	16.13%	6.13%	4.93%	7.55%	1.24%	3.14%	5.56%	3.72%	2.98%	0.15%	0.24%	9.30%
MAP@5	12.44%	8.71%	46.94%	13.39%	5.14%	4.17%	6.02%	1.20%	2.62%	4.66%	2.98%	2.58%	0.17%	0.20%	7.94%

表10 GMN-9-rm_body

	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	97.37%	94.74%	100.00%	89.47%	81.58%	92.11%	86.84%	89.19%	86.84%	89.19%	91.89%	89.47%	58.97%	52.63%	85.74%
preciou@2	96.10%	92.21%	100.00%	92.21%	90.91%	75.32%	50.65%	69.33%	59.21%	69.33%	61.33%	50.00%	39.74%	29.87%	69.73%
preciou@3	94.83%	89.57%	100.00%	78.45%	71.55%	53.45%	36.52%	49.56%	41.23%	46.43%	41.96%	34.21%	29.66%	19.83%	56.23%
preciou@4	93.55%	73.38%	100.00%	61.94%	55.48%	40.65%	28.57%	37.75%	32.89%	34.67%	32.00%	26.80%	22.29%	16.13%	46.86%
preciou@5	92.27%	61.66%	100.00%	50.52%	45.36%	32.99%	23.32%	30.16%	26.84%	27.81%	25.67%	21.99%	18.27%	13.47%	40.74%
recall@1	18.59%	23.68%	8.93%	32.69%	30.10%	47.30%	53.23%	54.10%	57.89%	60.00%	65.38%	73.91%	54.76%	66.67%	46.23%
recall@2	37.19%	46.71%	18.75%	68.27%	67.96%	78.38%	62.90%	85.25%	78.95%	94.55%	88.46%	82.61%	73.81%	76.67%	68.60%
recall@3	55.28%	67.76%	28.57%	87.50%	80.58%	83.78%	67.74%	91.80%	82.46%	94.55%	90.38%	84.78%	83.33%	76.67%	76.80%
recall@4	72.86%	74.34%	38.39%	92.31%	83.50%	85.14%	70.97%	93.44%	87.72%	94.55%	92.31%	89.13%	83.33%	83.33%	81.52%
recall@5	89.95%	78.29%	48.21%	94.23%	85.44%	86.49%	72.58%	93.44%	89.47%	94.55%	92.31%	91.30%	85.71%	86.67%	84.90%
f1-score@1	31.22%	37.89%	16.39%	47.89%	43.97%	62.50%	66.00%	67.35%	69.47%	71.74%	76.40%	80.95%	56.79%	58.82%	60.07%
f1-score@2	53.62%	62.01%	31.58%	78.45%	77.78%	76.82%	56.12%	76.47%	67.67%	80.00%	72.44%	62.30%	51.67%	42.99%	69.16%
f1-score@3	69.84%	77.15%	44.44%	82.73%	75.80%	65.26%	47.46%	64.37%	54.97%	62.28%	57.32%	48.75%	43.75%	31.51%	64.93%
f1-score@4	81.92%	73.86%	55.48%	74.13%	66.67%	55.02%	40.74%	53.77%	47.85%	50.73%	47.52%	41.21%	35.18%	27.03%	59.51%
f1-score@5	91.09%	68.99%	65.06%	65.77%	59.26%	47.76%	35.29%	45.60%	41.30%	42.98%	40.17%	35.44%	30.13%	23.32%	55.06%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	50.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	96.43%
MAP@1	96.67%	89.55%	100.00%	87.74%	68.31%	82.76%	78.47%	83.12%	82.06%	83.30%	82.21%	89.03%	42.95%	42.02%	79.16%
MAP@2	94.52%	87.58%	100.00%	86.69%	78.00%	67.45%	43.81%	62.36%	53.50%	62.46%	54.42%	49.05%	26.58%	22.52%	63.50%
MAP@3	92.42%	84.04%	100.00%	72.85%	61.42%	46.95%	30.41%	43.51%	36.44%	41.82%	36.90%	33.11%	18.69%	14.95%	50.96%
MAP@4	90.37%	68.30%	100.00%	56.83%	47.23%	35.43%	23.14%	32.85%	28.09%	31.23%	27.80%	25.10%	14.04%	11.43%	42.28%
MAP@5	88.60%	56.55%	100.00%	45.98%	38.25%	28.51%	18.60%	26.24%	22.64%	25.05%	22.30%	20.24%	11.31%	9.26%	36.68%

表11 GMN-9-rm_title

	rails	joomla	angular	ceph	ansible	facebook	elastic	docker	cocos2d	django	hashicorp	emberjs	JuliaLang	dotnet	average
preciou@1	100.00%	92.11%	100.00%	97.37%	94.74%	92.11%	78.95%	94.59%	84.21%	94.59%	89.19%	84.21%	53.85%	60.53%	86.89%
preciou@2	100.00%	93.51%	100.00%	96.10%	83.12%	71.43%	49.35%	64.00%	59.21%	64.00%	64.00%	46.05%	34.62%	32.47%	68.42%
preciou@3	96.55%	77.39%	100.00%	71.55%	62.93%	51.72%	34.78%	45.13%	40.35%	43.75%	43.75%	31.58%	24.58%	23.28%	53.38%
preciou@4	90.97%	61.04%	100.00%	56.77%	47.74%	38.71%	27.92%	35.76%	30.26%	32.67%	32.67%	23.53%	19.11%	17.42%	43.90%
preciou@5	80.41%	50.26%	100.00%	46.39%	39.69%	30.93%	23.32%	29.10%	25.26%	26.20%	26.20%	19.37%	15.74%	14.51%	37.67%
recall@1	19.10%	23.03%	8.93%	35.58%	34.95%	47.30%	48.39%	57.38%	56.14%	63.64%	63.46%	69.57%	50.00%	76.67%	46.72%
recall@2	38.69%	47.37%	18.75%	71.15%	62.14%	74.32%	61.29%	78.69%	78.95%	87.27%	92.31%	76.09%	64.29%	83.33%	66.76%
recall@3	56.28%	58.55%	28.57%	79.81%	70.87%	81.08%	64.52%	83.61%	80.70%	89.09%	94.23%	78.26%	69.05%	90.00%	73.19%
recall@4	70.85%	61.84%	38.39%	84.62%	71.84%	81.08%	69.35%	88.52%	80.70%	89.09%	94.23%	78.26%	71.43%	90.00%	76.44%
recall@5	78.39%	63.82%	48.21%	86.54%	74.76%	81.08%	72.58%	90.16%	84.21%	89.09%	94.23%	80.43%	73.81%	93.33%	79.33%
f1-score@1	32.07%	36.84%	16.39%	52.11%	51.06%	62.50%	60.00%	71.43%	67.37%	76.09%	74.16%	76.19%	51.85%	67.65%	60.77%
f1-score@2	55.80%	62.88%	31.58%	81.77%	71.11%	72.85%	54.68%	70.59%	67.67%	73.85%	75.59%	57.38%	45.00%	46.73%	67.58%
f1-score@3	71.11%	66.67%	44.44%	75.45%	66.67%	63.16%	45.20%	58.62%	53.80%	58.68%	59.76%	45.00%	36.25%	36.99%	61.74%
f1-score@4	79.66%	61.44%	55.48%	67.95%	57.36%	52.40%	39.81%	50.94%	44.02%	47.80%	48.51%	36.18%	30.15%	29.19%	55.77%
f1-score@5	79.39%	56.23%	65.06%	60.40%	51.85%	44.78%	35.29%	44.00%	38.87%	40.50%	41.00%	31.22%	25.94%	25.11%	51.08%
MRR	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%	100.00%
MAP@1	100.00%	87.91%	100.00%	97.37%	93.02%	89.18%	75.32%	94.14%	79.19%	91.47%	84.66%	81.79%	45.71%	54.24%	83.86%
MAP@2	100.00%	88.25%	100.00%	94.72%	79.65%	67.55%	43.68%	61.70%	53.75%	60.58%	58.54%	43.93%	25.89%	27.76%	64.71%
MAP@3	96.14%	72.41%	100.00%	70.16%	58.74%	47.54%	30.06%	42.34%	36.19%	41.13%	39.60%	29.65%	17.70%	18.90%	50.04%
MAP@4	89.58%	56.35%	100.00%	54.62%	44.33%	35.58%	23.08%	32.50%	27.14%	30.71%	29.57%	22.09%	13.44%	14.15%	40.94%
MAP@5	78.39%	45.85%	100.00%	44.15%	36.10%	28.43%	18.69%	26.15%	22.00%	24.63%	23.72%	17.80%	10.80%	11.45%	34.87%