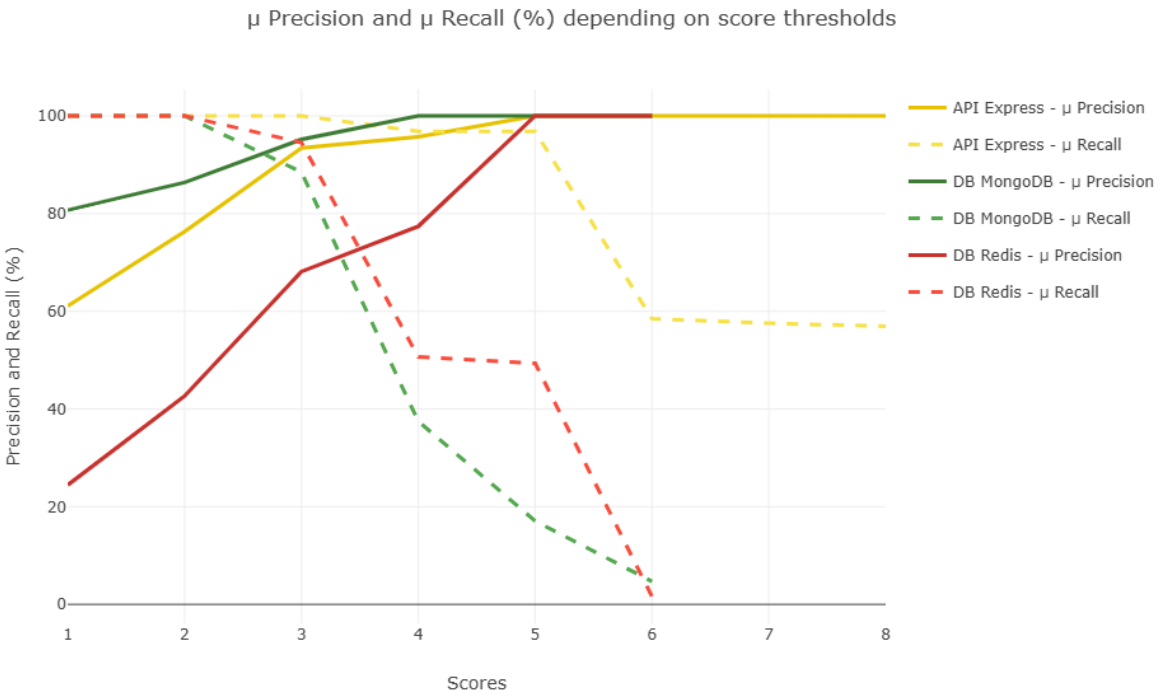
Evaluation summary

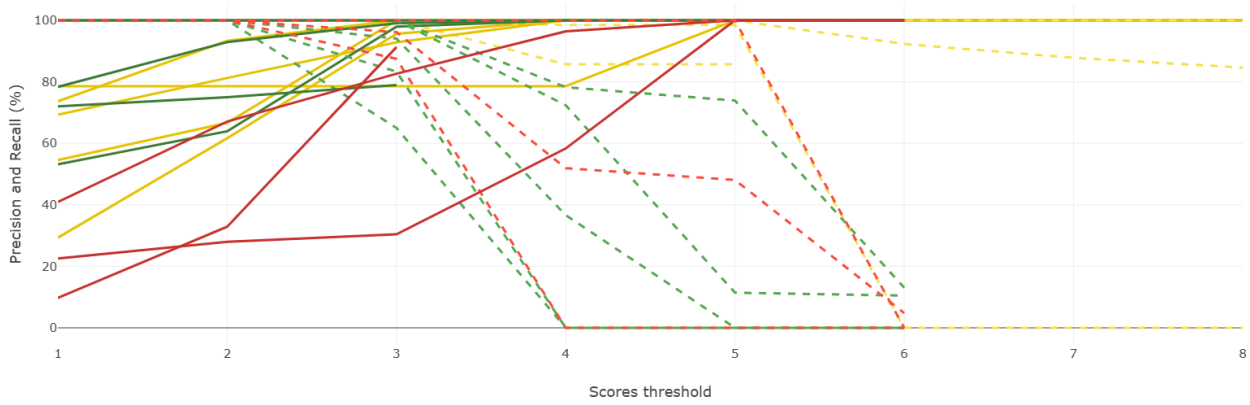
Code fragments identification evaluation

For evaluating the performance of our approach, we compare the report automatically obtained by our implementation with the ground truth. For each project, we compute the precision and the recall depending on the minimum score threshold set.

This chart represents the trends in the evolution of precision and recall as a function of score thresholds.



This chart represents raw data behind the previous chart.



We can deduce, for each project, the optimal score threshold based on the best balance between precision and recall.

The charts above are created based on the following table.

API Express		Scores	1	2	3	4	5	6	7	8
	comments-api	Precision	54,55%	66,67%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
		Recall	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
	cinema-microservice	Precision	73,68%	93,33%	100,00%	100,00%	100,00%	N/A	N/A	N/A
		Recall	100,00%	100,00%	100,00%	85,71%	85,71%	0,00%	0,00%	0,00%
	overleaf	Precision	69,33%	81,25%	92,86%	100,00%	100,00%	100,00%	100,00%	100,00%
		Recall	100,00%	100,00%	100,00%	100,00%	100,00%	92,31%	87,82%	84,62%
	cloudboost	Precision	29,33%	61,68%	95,65%	100,00%	100,00%	N/A	N/A	N/A
		Recall	100%	100,00%	100,00%	98,48%	98,48%	0%	0%	0%
	robot-shop	Precision	78,57%	78,57%	78,57%	78,57%	100,00%	100,00%	100,00%	100,00%
		Recall	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
		Precision average (μ)	61,09%	76,30%	93,42%	95,71%	**100,00%**	100,00%	100,00%	100,00%
		Recall average (μ)	100,00%	100,00%	100,00%	96,84%	**96,84%**	58,46%	57,56%	56,92%

DB Mongo		Scores	1	2	3	4	5	6
	comments-api	Precision	72,00%	75,00%	78,95%	N/A	N/A	N/A
		Recall	100,00%	100,00%	83,33%	0,00%	0,00%	0,00%
	cinema-microservice	Precision	100,00%	100,00%	100,00%	N/A	N/A	N/A
		Recall	100,00%	100,00%	65,00%	0,00%	0,00%	0,00%
	overleaf	Precision	78,36%	92,92%	99,06%	100,00%	100,00%	100,00%
		Recall	100,00%	100,00%	100,00%	72,38%	11,43%	10,48%
	cloudboost	Precision	53,16%	63,92%	97,94%	100,00%	N/A	N/A
		Recall	100%	100,00%	94,06%	36,63%	0%	0%
	robot-shop	Precision	100,00%	100,00%	100,00%	100,00%	100,00%	100,00%
		Recall	100,00%	100,00%	100,00%	78,26%	73,91%	13,04%
		Precision average (μ)	80,70%	86,37%	**95,19%**	100,00%	100,00%	100,00%
		Recall average (μ)	100,00%	100,00%	**88,48%**	37,46%	17,07%	4,70%

DB Redis		Scores	1	2	3	4	5	6
	overleaf	Precision	40,94%	67,10%	82,64%	96,43%	100,00%	100,00%
		Recall	100,00%	100,00%	96,15%	51,92%	48,08%	4,81%
	cloudboost	Precision	9,76%	32,88%	91,30%	N/A	N/A	N/A
		Recall	100%	100,00%	87,50%	0%	0%	0%
	robot-shop	Precision	22,58%	28,00%	30,43%	58,33%	100,00%	N/A
		Recall	100,00%	100,00%	100,00%	100,00%	100,00%	0,00%
		Precision average (μ)	24,43%	42,66%	**68,13%**	77,38%	100,00%	100,00%
		Recall average (μ)	100,00%	100,00%	**94,55%**	50,64%	49,36%	1,60%

Heuristics evaluation

For evaluating the individual relevance of our code fragment identification heuristics, we compute separately their precision and recall for each project codebase, based on the ground truth. We remove heuristics that make no contribution to the score.