

# On Improving the Cohesiveness of Graphs by Merging Nodes: Supplementary Materials

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## 1. Full experimental results

In this section, we show the full results of our experiments which we cannot put all in the main text due to the space limit.

### 1.1. Main experiments

**Experimental settings.** For each dataset, we conduct experiments for each  $k \in \{5, 10, 15, 20\}$ . We use  $b = 10$ , check 100 inside nodes and 50 outside nodes, and  $n_c$ , the number of pairs to check in each round, takes a value in  $\{1, 2, 5, 10, 15, 20\}$ . We conduct all the experiments on a machine with i9-10900K CPU and 64GB RAM. All algorithms are implemented in C++, and complied by G++ with O3 optimization.

In Tables 1 to 14, we report the full results of each dataset for all the considered parameters.

### 1.2. Sampling experiments

**Experimental settings.** For each dataset and each  $k \in \{5, 10, 15, 20\}$ , we randomly sample 10,000 **inside-inside (II)/inside-outside (IO)/outside-outside (OO)** mergers. For each experimental setting (dataset and  $k$ ) and each case (II/IO/OO), we do five independent trials. We do this for one round (i.e., the budget  $b = 1$ ).

In Figures 1 to 14, we report the full results of each dataset. In each plot, the  $x$ -axis represents the sampling size, and for each sampling size  $1 \leq x \leq 10000$ , the corresponding  $y$  value represents the best performance among the first  $x$  sampled mergers. We report the mean value and the standard deviation of five independent trials.

### 1.3. Heuristics experiments

**Experimental settings.** We study IOMs and IIMs separately. For each dataset and each  $k \in \{5, 10, 15, 20\}$ , we report the best performance among the mergers using the 100 inside nodes chosen by each node-heuristic (heuristic that chooses inside nodes), and report the best performance among the 10 mergers chosen by each pair-heuristic (heuristic that chooses pairs to be merged). The candidate mergers that each pair-heuristic chooses among are those using the 100 inside nodes chosen by the node-heuristic IP which performs best among all the considered node heuristics.

In Tables 15 to 28, we report the full results of each dataset.

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(190, 0.163258)	(588, 0.395745)	(1303, 0.452645)	(1527, 0.373819)
	2	(194, 0.297094)	(844, 0.630798)	(1376, 0.682457)	(1528, 0.434685)
	5	(200, 0.433535)	(953, 0.704848)	(1344, 0.748737)	(1445, 0.441133)
	10	(212, 0.536766)	(974, 0.868098)	(1343, 0.780103)	(1634, 0.503709)
	15	(215, 0.753264)	(947, 1.10923)	(1366, 1.040943)	(1634, 0.580716)
	20	(215, 0.939869)	(947, 1.321407)	(1278, 1.090379)	(1201, 0.571081)
EQ	1	N/A	N/A	N/A	N/A
	2	(194, 0.282179)	(844, 0.611814)	(1376, 0.671509)	(1528, 0.423497)
	5	(206, 0.349339)	(895, 0.661047)	(1304, 0.698516)	(1487, 0.456046)
	10	(213, 0.552619)	(896, 0.864929)	(1458, 0.778773)	(1124, 0.480327)
	15	(207, 0.691299)	(911, 1.08249)	(1406, 0.950659)	(1159, 0.512248)
	20	(221, 0.916641)	(974, 1.288419)	(1379, 1.12371)	(1159, 0.565624)
II	1	(190, 0.138759)	(908, 0.306687)	(1303, 0.411716)	(774, 0.333101)
	2	(204, 0.210995)	(908, 0.383291)	(1408, 0.472175)	(757, 0.343574)
	5	(211, 0.315223)	(896, 0.516913)	(1348, 0.546718)	(1178, 0.374554)
	10	(214, 0.484388)	(978, 0.681726)	(1435, 0.634548)	(754, 0.400293)
	15	(213, 0.687604)	(947, 0.908359)	(1448, 0.813922)	(820, 0.470702)
	20	(225, 0.839121)	(947, 1.11379)	(1256, 0.883392)	(820, 0.499459)
IO	1	(139, 0.145697)	(588, 0.35929)	(1417, 0.416889)	(1527, 0.36234)
	2	(138, 0.210198)	(636, 0.430234)	(1290, 0.491398)	(1238, 0.391185)
	5	(138, 0.303721)	(588, 0.563956)	(1411, 0.578495)	(1099, 0.407051)
	10	(145, 0.45026)	(697, 0.731267)	(1320, 0.722222)	(1634, 0.463949)
	15	(145, 0.620213)	(641, 0.958933)	(1452, 0.844707)	(1657, 0.520014)
	20	(145, 0.799318)	(643, 1.167234)	(1452, 0.991405)	(1608, 0.574232)
NT	1	(73, 1.316854)	(428, 1.131434)	(833, 0.762351)	(626, 0.377389)
	2	(72, 2.450766)	(504, 2.046731)	(1072, 1.327413)	(796, 0.54811)
	5	(81, 4.92864)	(465, 4.243704)	(1135, 2.765242)	(1140, 1.070902)
	10	(101, 7.167055)	(587, 6.50248)	(1089, 4.260347)	(1153, 1.559173)
	15	(109, 7.344824)	(590, 6.496875)	(1114, 4.242718)	(1129, 1.541246)
	20	(112, 7.488949)	(595, 6.70923)	(1287, 4.406364)	(1148, 1.600867)
NE	1	(93, 0.074646)	(263, 0.130554)	(394, 0.190378)	(1137, 0.209669)
	2	(93, 0.104544)	(263, 0.168751)	(394, 0.221188)	(1137, 0.21616)
	5	(93, 0.201608)	(263, 0.289639)	(394, 0.31141)	(1137, 0.249993)
	10	(129, 0.353582)	(433, 0.479871)	(888, 0.464709)	(1084, 0.300897)
	15	(93, 0.511208)	(263, 0.682291)	(394, 0.580377)	(1137, 0.359938)
	20	(93, 0.660565)	(263, 0.875819)	(394, 0.736546)	(1137, 0.39993)
RD	1	(35, 0.09364)	(42, 0.202609)	(174, 0.277664)	(351, 0.30549)
	2	(23, 0.124586)	(219, 0.251621)	(313, 0.308926)	(343, 0.307641)
	5	(39, 0.194363)	(264, 0.309078)	(619, 0.360495)	(376, 0.324811)
	10	(66, 0.391954)	(261, 0.557491)	(652, 0.526545)	(654, 0.404832)
	15	(56, 0.514945)	(479, 0.710561)	(660, 0.631788)	(749, 0.446687)
	20	(66, 0.695103)	(401, 0.935773)	(817, 0.815195)	(662, 0.491332)

Table 1. The full results of the main experiments on *email*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(149, 0.506361)	(462, 0.948327)	(505, 1.133406)	(675, 1.171536)
	2	(152, 1.02818)	(620, 1.508909)	(505, 1.773869)	(1095, 1.66875)
	5	(158, 1.483856)	(640, 1.972026)	(631, 2.177783)	(1029, 2.040044)
	10	(163, 2.351635)	(675, 2.764291)	(678, 2.927482)	(1093, 2.70812)
	15	(177, 3.252112)	(675, 3.850927)	(636, 3.978673)	(1124, 3.711568)
	20	(172, 4.169596)	(678, 4.697119)	(678, 4.983967)	(1099, 4.534922)
EQ	1	N/A	N/A	N/A	N/A
	2	(152, 0.987369)	(620, 1.519664)	(505, 1.732861)	(1095, 1.669056)
	5	(158, 1.337278)	(652, 1.808965)	(513, 2.116939)	(1076, 1.996077)
	10	(164, 2.316492)	(675, 2.789305)	(617, 2.940854)	(1176, 2.733471)
	15	(164, 3.114176)	(682, 3.624242)	(617, 3.789719)	(1135, 3.48443)
	20	(171, 4.126044)	(678, 4.729749)	(678, 4.77951)	(1075, 4.421955)
II	1	(149, 0.463815)	(490, 0.796277)	(505, 1.034633)	(675, 1.115816)
	2	(149, 0.820292)	(556, 1.177575)	(612, 1.378685)	(662, 1.40776)
	5	(154, 1.353022)	(550, 1.731343)	(617, 1.878777)	(797, 1.890962)
	10	(171, 2.127139)	(627, 2.483068)	(678, 2.662917)	(877, 2.489292)
	15	(185, 3.103649)	(633, 3.549826)	(678, 3.586211)	(847, 3.418032)
	20	(185, 4.020618)	(616, 4.406482)	(678, 4.429359)	(896, 4.202753)
IO	1	(70, 0.485909)	(462, 0.868455)	(393, 1.137245)	(981, 1.218973)
	2	(84, 0.825116)	(531, 1.240481)	(393, 1.477159)	(1141, 1.487601)
	5	(89, 1.337836)	(653, 1.739939)	(387, 1.996417)	(1266, 1.920456)
	10	(89, 2.119162)	(654, 2.572274)	(352, 2.759679)	(1158, 2.568547)
	15	(90, 3.014986)	(672, 3.503828)	(411, 3.686824)	(1226, 3.380297)
	20	(90, 3.88141)	(657, 4.368629)	(349, 4.635049)	(1200, 4.090064)
NT	1	(25, 4.802132)	(185, 4.553131)	(165, 4.410222)	(212, 4.128859)
	2	(25, 8.323137)	(265, 8.190111)	(175, 7.638757)	(241, 6.939943)
	5	(20, 17.131463)	(276, 16.749262)	(232, 15.494895)	(264, 14.106341)
	10	(20, 27.410854)	(283, 27.03053)	(264, 24.976688)	(289, 22.699999)
	15	(24, 27.212796)	(273, 26.827285)	(296, 24.811599)	(301, 22.458058)
	20	(27, 27.993103)	(219, 27.642417)	(292, 25.626299)	(310, 23.035773)
NE	1	(9, 0.483263)	(0, 0.610785)	(0, 0.757779)	(0, 0.890101)
	2	(9, 0.629466)	(0, 0.787201)	(0, 0.907253)	(0, 1.020575)
	5	(9, 1.168563)	(0, 1.28736)	(0, 1.409836)	(0, 1.496966)
	10	(16, 1.890344)	(0, 2.065769)	(0, 2.246718)	(0, 2.158495)
	15	(9, 2.793643)	(0, 2.996425)	(0, 3.136047)	(0, 3.003932)
	20	(9, 3.632236)	(0, 3.903284)	(0, 3.904875)	(0, 3.791944)
RD	1	(-7, 0.478493)	(-1, 0.722488)	(-14, 0.951511)	(-157, 1.147531)
	2	(1, 0.645246)	(10, 0.931899)	(11, 1.160903)	(5, 1.293247)
	5	(1, 1.021822)	(23, 1.284559)	(9, 1.480335)	(38, 1.562286)
	10	(14, 1.992733)	(32, 2.313069)	(77, 2.51362)	(86, 2.488989)
	15	(12, 2.675058)	(34, 3.037993)	(36, 3.234321)	(46, 3.125762)
	20	(10, 3.640068)	(117, 4.074742)	(115, 4.248889)	(49, 4.021556)

Table 2. The full results of the main experiments on *facebook*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(2660, 7.633889)	(759, 4.289924)	(606, 3.520721)	(738, 3.435266)
	2	(2660, 11.775407)	(759, 5.206878)	(635, 3.837289)	(753, 3.84938)
	5	(2601, 13.85089)	(941, 5.995754)	(749, 4.323002)	(923, 3.913824)
	10	(2606, 17.86887)	(974, 7.244179)	(674, 4.795776)	(967, 4.370866)
	15	(2606, 22.462996)	(940, 8.762238)	(677, 5.658468)	(870, 5.10412)
	20	(2606, 26.806823)	(960, 10.224163)	(705, 6.411012)	(888, 5.76321)
EQ	1	N/A	N/A	N/A	N/A
	2	(2660, 11.641451)	(759, 5.143468)	(635, 3.952877)	(753, 3.644825)
	5	(2644, 13.210472)	(866, 5.820045)	(617, 4.187215)	(818, 3.821646)
	10	(2601, 17.397328)	(937, 7.049637)	(762, 4.711021)	(867, 4.349421)
	15	(2606, 21.439289)	(983, 8.432824)	(705, 5.630066)	(867, 5.113627)
	20	(2606, 26.201712)	(951, 10.179697)	(719, 6.563192)	(870, 5.757685)
II	1	(2660, 7.014586)	(759, 4.099205)	(507, 3.402992)	(535, 3.265395)
	2	(2644, 8.570758)	(866, 4.560648)	(518, 3.426621)	(538, 3.325384)
	5	(2601, 11.002977)	(906, 5.279612)	(617, 3.9874)	(564, 3.80108)
	10	(2606, 15.256073)	(936, 6.663428)	(682, 4.563828)	(571, 4.192416)
	15	(2606, 19.08951)	(954, 7.858194)	(655, 5.383557)	(651, 4.826672)
	20	(2606, 23.448812)	(944, 9.089351)	(682, 6.010336)	(622, 5.58813)
IO	1	(563, 7.180937)	(666, 4.328697)	(606, 3.496552)	(738, 3.371479)
	2	(618, 8.639106)	(414, 4.809814)	(689, 3.638419)	(912, 3.561971)
	5	(598, 10.839214)	(610, 5.62101)	(772, 4.184578)	(921, 3.808747)
	10	(604, 14.174811)	(595, 6.497019)	(796, 4.620337)	(923, 4.280902)
	15	(618, 18.288144)	(594, 7.977383)	(807, 5.632297)	(837, 5.012554)
	20	(612, 22.374368)	(640, 9.567872)	(807, 6.256049)	(837, 5.788372)
NT	1	(532, 7.518926)	(371, 4.91902)	(409, 4.087247)	(380, 3.841569)
	2	(530, 12.03291)	(287, 6.96289)	(443, 5.47965)	(419, 4.904233)
	5	(577, 22.764435)	(300, 12.170004)	(470, 8.886947)	(416, 7.767748)
	10	(613, 39.233378)	(332, 21.191422)	(523, 14.484679)	(445, 12.271197)
	15	(613, 38.239648)	(359, 18.641235)	(590, 13.312159)	(515, 11.42225)
	20	(613, 41.894058)	(411, 19.597006)	(629, 13.746571)	(542, 11.971981)
NE	1	(219, 2.906677)	(78, 2.720494)	(116, 2.747374)	(184, 2.789192)
	2	(219, 3.663202)	(78, 2.963913)	(116, 2.88292)	(184, 2.912347)
	5	(219, 5.929757)	(78, 3.733847)	(116, 3.341918)	(184, 3.293982)
	10	(316, 9.966511)	(170, 5.009166)	(191, 4.191981)	(346, 3.908425)
	15	(219, 13.353948)	(78, 6.313105)	(116, 4.734477)	(184, 4.500818)
	20	(219, 17.166411)	(78, 7.551934)	(116, 5.43375)	(184, 5.182752)
RD	1	(3, 4.93581)	(50, 3.678218)	(-68, 3.118525)	(-2, 3.084485)
	2	(9, 5.627936)	(2, 3.963403)	(115, 3.250154)	(54, 3.154718)
	5	(6, 7.074868)	(77, 4.426632)	(181, 3.55516)	(271, 3.391911)
	10	(27, 11.565817)	(111, 6.226378)	(165, 4.524875)	(335, 4.239357)
	15	(17, 14.382752)	(167, 6.908416)	(112, 5.006554)	(282, 4.594821)
	20	(52, 19.584597)	(129, 8.378082)	(238, 5.881316)	(348, 5.450063)

Table 3. The full results of the main experiments on *brightkite*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(511, 4.331406)	(2251, 5.445484)	(2293, 5.092611)	(4206, 5.190955)
	2	(511, 7.368159)	(2251, 7.866471)	(2486, 6.35433)	(4054, 6.097935)
	5	(544, 9.032235)	(2371, 8.981611)	(2590, 7.032122)	(4067, 6.437749)
	10	(526, 11.510036)	(2419, 11.134309)	(2668, 8.266657)	(3971, 6.609456)
	15	(552, 15.222338)	(2419, 14.188718)	(2738, 9.63729)	(4320, 7.399298)
	20	(556, 18.698971)	(2464, 16.68068)	(2738, 11.13879)	(4326, 7.999017)
EQ	1	N/A	N/A	N/A	N/A
	2	(511, 7.321111)	(2251, 7.676253)	(2486, 6.339604)	(4054, 6.03925)
	5	(554, 8.473394)	(2260, 8.626599)	(2509, 7.061166)	(4270, 6.04146)
	10	(561, 11.800697)	(2391, 11.205999)	(2673, 8.185404)	(3982, 6.583055)
	15	(526, 14.552206)	(2419, 13.813283)	(2668, 9.529306)	(4116, 7.424883)
	20	(526, 18.264272)	(2419, 16.406695)	(2738, 11.096055)	(4220, 7.607183)
II	1	(511, 3.870919)	(2251, 4.976404)	(2293, 4.810573)	(4206, 4.784768)
	2	(554, 5.19664)	(2260, 5.952932)	(2587, 5.369132)	(4178, 4.922209)
	5	(561, 7.048542)	(2391, 7.489798)	(2736, 5.913927)	(3951, 5.258277)
	10	(526, 10.603894)	(2419, 10.044706)	(2696, 7.635753)	(4324, 5.678987)
	15	(542, 13.509703)	(2419, 12.478366)	(2696, 8.871025)	(4297, 6.356354)
	20	(557, 17.138216)	(2464, 14.813504)	(2803, 10.09049)	(4297, 7.013217)
IO	1	(253, 3.62462)	(807, 5.110506)	(1941, 5.200724)	(2661, 5.386959)
	2	(267, 4.718587)	(838, 5.855962)	(1810, 5.676982)	(3195, 5.39356)
	5	(303, 6.34697)	(919, 7.50673)	(1756, 6.367354)	(3077, 5.783836)
	10	(298, 8.802689)	(946, 9.613448)	(1975, 7.534384)	(3732, 6.110118)
	15	(288, 11.671551)	(953, 11.961914)	(2002, 9.285292)	(3706, 6.872089)
	20	(278, 14.307012)	(933, 14.2551)	(2009, 10.585216)	(3873, 7.553795)
NT	1	(134, 10.738631)	(783, 7.442617)	(1648, 5.438749)	(3330, 4.277926)
	2	(142, 18.263571)	(826, 11.940534)	(1749, 7.689251)	(3470, 5.097733)
	5	(238, 36.935501)	(895, 21.992599)	(1924, 12.950219)	(3465, 7.417933)
	10	(242, 53.261851)	(875, 35.932222)	(1949, 21.180753)	(3888, 11.740368)
	15	(242, 58.864717)	(927, 34.930516)	(1959, 19.943574)	(3457, 10.411915)
	20	(244, 61.634726)	(928, 37.404548)	(1888, 21.231685)	(3629, 10.944137)
NE	1	(96, 1.883449)	(333, 2.670745)	(369, 3.156782)	(1273, 3.440137)
	2	(96, 2.50555)	(333, 3.098938)	(369, 3.420798)	(1273, 3.596383)
	5	(96, 3.918953)	(333, 4.518043)	(369, 4.203173)	(1273, 4.062471)
	10	(150, 6.508428)	(473, 6.744301)	(677, 5.571919)	(1337, 4.780549)
	15	(96, 9.349192)	(333, 9.112854)	(369, 6.814711)	(1273, 5.572274)
	20	(96, 11.92908)	(333, 11.537116)	(369, 8.080567)	(1273, 6.342468)
RD	1	(2, 2.086758)	(16, 3.947758)	(73, 4.294525)	(218, 4.13741)
	2	(7, 2.612672)	(103, 4.312337)	(215, 4.549018)	(1276, 4.31771)
	5	(2, 3.625463)	(131, 5.261591)	(594, 5.061123)	(1770, 4.634283)
	10	(10, 6.822703)	(300, 8.060247)	(772, 6.506863)	(1994, 5.512082)
	15	(12, 9.075867)	(284, 10.132303)	(825, 7.534221)	(2504, 5.927042)
	20	(23, 12.33712)	(360, 12.98275)	(845, 9.166356)	(2724, 6.702388)

Table 4. The full results of the main experiments on *enron*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(1880, 10.71228)	(3239, 15.911818)	(1202, 13.304726)	(1309, 12.044654)
	2	(1880, 19.355977)	(3239, 21.000184)	(1423, 13.881173)	(1154, 12.016041)
	5	(1914, 25.084593)	(3210, 24.484485)	(1487, 14.438804)	(1230, 11.795518)
	10	(1897, 34.753535)	(3305, 31.267398)	(1668, 14.691768)	(1282, 11.975049)
	15	(1897, 46.433482)	(3305, 38.903798)	(1668, 15.861955)	(1419, 12.384224)
	20	(1897, 57.769216)	(3305, 45.976823)	(1735, 17.265859)	(1327, 12.78748)
EQ	1	N/A	N/A	N/A	N/A
	2	(1880, 18.920002)	(3239, 20.863257)	(1423, 13.529899)	(1154, 11.746036)
	5	(1865, 23.131213)	(3239, 23.511837)	(1727, 13.829663)	(1225, 11.902334)
	10	(1914, 34.562731)	(3305, 30.660947)	(1670, 14.639725)	(1289, 11.906666)
	15	(1897, 43.864536)	(3305, 37.108482)	(1573, 15.868421)	(1247, 12.38159)
	20	(1897, 55.831186)	(3305, 45.19937)	(1716, 17.017798)	(1377, 13.189475)
II	1	(1880, 9.928412)	(3239, 15.159316)	(1494, 12.704985)	(974, 11.709136)
	2	(1865, 14.008636)	(3239, 17.550303)	(1670, 13.081662)	(969, 11.524561)
	5	(1914, 20.544462)	(3305, 21.620116)	(1779, 13.34531)	(993, 12.081781)
	10	(1897, 31.228379)	(3305, 27.702994)	(1579, 14.490075)	(1037, 11.943175)
	15	(1897, 41.566679)	(3305, 34.459385)	(1591, 15.280399)	(1037, 12.185434)
	20	(1897, 51.697639)	(3305, 41.698888)	(1678, 16.12399)	(986, 12.690062)
IO	1	(446, 10.507681)	(1486, 15.723185)	(1202, 13.027482)	(1309, 11.839805)
	2	(487, 14.628238)	(1884, 18.08194)	(1472, 13.024111)	(1384, 11.741507)
	5	(464, 21.155257)	(1663, 22.202272)	(1597, 13.652119)	(1239, 11.755369)
	10	(486, 30.477748)	(1694, 27.723429)	(1651, 14.424961)	(1440, 11.875024)
	15	(500, 40.967156)	(2122, 34.057724)	(1651, 15.465994)	(1494, 12.399112)
	20	(500, 52.151216)	(1935, 42.542172)	(1797, 16.509463)	(1431, 12.686913)
NT	1	(185, 15.613714)	(1459, 14.178798)	(1011, 12.249921)	(773, 11.548451)
	2	(263, 25.216267)	(1498, 18.081384)	(838, 12.964268)	(776, 11.626199)
	5	(374, 49.21995)	(1889, 28.206763)	(1070, 14.966518)	(717, 12.372918)
	10	(491, 86.139788)	(2015, 51.823022)	(902, 23.426422)	(967, 17.74904)
	15	(463, 88.918728)	(2016, 47.755671)	(1401, 19.107009)	(996, 13.495021)
	20	(477, 99.358816)	(2015, 54.490456)	(1352, 19.638155)	(828, 13.64916)
NE	1	(12, 7.222833)	(0, 10.950282)	(20, 11.108081)	(428, 11.147636)
	2	(12, 9.055707)	(0, 12.183232)	(20, 11.29506)	(428, 11.223747)
	5	(12, 15.460855)	(0, 15.839832)	(20, 11.986463)	(428, 11.414039)
	10	(148, 25.873818)	(138, 22.346785)	(16, 12.837359)	(90, 11.690283)
	15	(12, 35.600186)	(0, 29.10255)	(20, 13.885689)	(428, 12.032483)
	20	(12, 46.373334)	(0, 34.820893)	(20, 14.854479)	(428, 12.373706)
RD	1	(0, 8.070257)	(0, 13.770937)	(0, 12.127693)	(88, 11.294168)
	2	(7, 9.89358)	(1, 15.024687)	(8, 12.293329)	(96, 11.355414)
	5	(1, 13.864795)	(0, 17.633792)	(3, 12.70848)	(273, 11.566043)
	10	(13, 26.739019)	(27, 25.426077)	(74, 13.92805)	(174, 11.872816)
	15	(25, 34.082305)	(204, 31.451282)	(138, 14.873115)	(401, 12.145065)
	20	(22, 46.099643)	(190, 38.863589)	(260, 16.012712)	(440, 12.447638)

Table 5. The full results of the main experiments on *hepph*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(6502, 14.009076)	(7422, 14.679457)	(5780, 16.213886)	(4647, 15.751298)
	2	(6502, 22.344013)	(7422, 20.710244)	(6210, 19.447721)	(4934, 16.959438)
	5	(6637, 29.08989)	(7533, 25.647605)	(6681, 23.093492)	(5281, 17.980626)
	10	(6637, 40.696907)	(7533, 34.454681)	(6437, 26.957407)	(4942, 20.196656)
	15	(6637, 52.941491)	(7598, 44.065532)	(6437, 31.977536)	(4901, 22.260134)
	20	(6637, 64.841984)	(7598, 53.258305)	(6424, 37.207439)	(4818, 24.122128)
EQ	1	N/A	N/A	N/A	N/A
	2	(6502, 22.395535)	(7422, 20.669226)	(6210, 19.259234)	(4934, 17.382814)
	5	(6566, 26.95458)	(7383, 24.252107)	(6296, 21.941935)	(4760, 17.675723)
	10	(6637, 40.199188)	(7533, 34.247148)	(6258, 26.508954)	(5099, 20.104714)
	15	(6637, 50.061666)	(7533, 42.551266)	(6437, 31.300332)	(4868, 22.052029)
	20	(6637, 64.309491)	(7598, 53.074237)	(6437, 37.134823)	(5091, 24.256497)
II	1	(6502, 13.020298)	(7422, 14.011352)	(5780, 15.102904)	(4647, 15.371281)
	2	(6566, 17.572612)	(7383, 17.345369)	(6198, 16.74011)	(4505, 15.681111)
	5	(6637, 24.936549)	(7533, 22.787584)	(6498, 20.076558)	(4522, 16.746233)
	10	(6637, 36.842822)	(7598, 32.665774)	(6444, 24.675284)	(4522, 18.867458)
	15	(6637, 48.663534)	(7598, 41.064545)	(6601, 29.358617)	(4573, 20.916193)
	20	(6637, 60.973164)	(7598, 50.015291)	(6512, 34.012869)	(4567, 22.750986)
IO	1	(724, 12.581297)	(3232, 14.817602)	(5554, 16.286631)	(4633, 16.595315)
	2	(724, 16.798537)	(3302, 18.140384)	(5114, 17.774026)	(4654, 16.344556)
	5	(731, 23.663116)	(3363, 23.349389)	(5266, 20.962841)	(4906, 17.199864)
	10	(733, 33.785853)	(3429, 31.778832)	(5325, 25.200098)	(5058, 19.132696)
	15	(739, 46.322793)	(3509, 41.170955)	(5029, 30.604151)	(5198, 22.107354)
	20	(730, 56.169985)	(3338, 50.081576)	(5029, 35.782734)	(5165, 23.562279)
NT	1	(675, 24.167564)	(3003, 20.321986)	(3953, 17.597147)	(4306, 15.468346)
	2	(687, 39.750607)	(3061, 30.566673)	(4127, 23.683506)	(4380, 18.519992)
	5	(751, 78.414224)	(2945, 55.958911)	(4683, 38.628292)	(4697, 26.570887)
	10	(757, 127.379362)	(3214, 93.788406)	(4968, 65.970313)	(4836, 43.972665)
	15	(781, 131.775808)	(3350, 93.01329)	(4982, 60.001404)	(4954, 37.727108)
	20	(781, 142.780931)	(3180, 102.161783)	(5155, 64.922102)	(4925, 39.824714)
NE	1	(275, 7.370404)	(874, 10.173047)	(1324, 11.814216)	(491, 12.521565)
	2	(275, 9.37843)	(874, 11.923304)	(1324, 12.848376)	(491, 12.910815)
	5	(275, 15.794254)	(874, 17.237137)	(1324, 15.893406)	(491, 14.346997)
	10	(357, 26.582149)	(1279, 26.279711)	(1653, 21.400361)	(774, 16.745987)
	15	(275, 37.006772)	(874, 34.932669)	(1324, 25.826337)	(491, 19.091083)
	20	(275, 47.663125)	(874, 43.770436)	(1324, 30.826765)	(491, 21.424672)
RD	1	(15, 9.700132)	(53, 13.060758)	(251, 14.402305)	(333, 14.10091)
	2	(40, 11.891144)	(204, 14.965532)	(870, 15.397589)	(1703, 14.681986)
	5	(117, 16.139847)	(850, 18.510415)	(1505, 17.313076)	(2159, 15.575501)
	10	(118, 29.474276)	(908, 29.621664)	(1907, 23.615062)	(2917, 18.531446)
	15	(139, 37.421587)	(829, 36.361822)	(2366, 27.304857)	(2919, 19.847579)
	20	(135, 50.370877)	(1083, 46.770155)	(2524, 32.542717)	(3014, 22.616209)

Table 6. The full results of the main experiments on *epinions*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(1399, 7.953749)	(1806, 7.376449)	(1302, 8.720494)	(1193, 8.159371)
	2	(1399, 13.250584)	(1806, 11.222614)	(1859, 10.938343)	(1332, 9.812224)
	5	(1404, 16.606493)	(1821, 13.930346)	(1920, 13.012133)	(1400, 11.523038)
	10	(1435, 21.827349)	(1872, 18.522814)	(1766, 15.586085)	(1303, 13.396541)
	15	(1467, 28.570891)	(1872, 24.503237)	(1574, 20.184689)	(1312, 16.084518)
	20	(1467, 34.881025)	(1876, 29.810441)	(1662, 23.744555)	(1326, 18.67953)
EQ	1	N/A	N/A	N/A	N/A
	2	(1399, 13.108872)	(1806, 10.868075)	(1859, 10.784598)	(1332, 10.09833)
	5	(1407, 15.511006)	(1821, 12.975058)	(1905, 12.289557)	(1279, 11.266874)
	10	(1435, 22.817317)	(1834, 18.198366)	(1952, 15.547785)	(1329, 13.307694)
	15	(1435, 27.209416)	(1806, 23.174056)	(1820, 19.458249)	(1323, 16.130359)
	20	(1445, 35.29857)	(1872, 29.688204)	(1590, 23.624911)	(1336, 18.755269)
II	1	(1399, 7.347652)	(1806, 7.081155)	(1728, 7.402999)	(1193, 7.493956)
	2	(1407, 9.912281)	(1821, 9.027593)	(1649, 8.69315)	(1224, 8.236692)
	5	(1435, 13.420627)	(1821, 12.348087)	(1724, 10.95328)	(1272, 9.71036)
	10	(1445, 22.163684)	(1872, 17.916443)	(1645, 14.745402)	(1316, 12.522046)
	15	(1467, 25.681819)	(1876, 22.858826)	(1645, 18.432552)	(1324, 14.675866)
	20	(1467, 32.023161)	(1876, 28.102126)	(1709, 22.085486)	(1342, 17.1649)
IO	1	(344, 6.962134)	(734, 7.338649)	(1302, 8.383445)	(1078, 8.590261)
	2	(327, 9.15968)	(729, 9.38972)	(1293, 9.778422)	(1198, 9.346424)
	5	(373, 12.85268)	(811, 12.347115)	(1361, 11.731662)	(1247, 10.700964)
	10	(363, 17.719778)	(742, 16.525877)	(1436, 15.063044)	(1230, 12.823346)
	15	(352, 23.680394)	(809, 21.543639)	(1524, 19.290959)	(1133, 16.408843)
	20	(354, 29.439376)	(809, 26.545)	(1524, 22.326641)	(1295, 18.101346)
NT	1	(273, 17.075997)	(608, 12.542701)	(1186, 10.383663)	(974, 9.07537)
	2	(264, 29.446356)	(752, 20.999337)	(1090, 16.217407)	(1282, 13.211717)
	5	(278, 57.006561)	(774, 41.079849)	(1189, 30.793082)	(1438, 23.824083)
	10	(284, 95.389934)	(854, 69.297485)	(1335, 52.808828)	(1500, 41.780687)
	15	(284, 93.791758)	(879, 66.696617)	(1377, 50.005423)	(1513, 38.528761)
	20	(286, 97.925998)	(880, 71.977105)	(1389, 53.819828)	(1615, 40.939716)
NE	1	(166, 3.621131)	(533, 4.608468)	(656, 5.246678)	(878, 5.60472)
	2	(166, 4.709424)	(533, 5.584783)	(656, 5.87103)	(878, 6.110478)
	5	(166, 7.966682)	(533, 8.348632)	(656, 7.968597)	(878, 7.644592)
	10	(240, 13.274469)	(557, 13.109462)	(789, 11.400203)	(1073, 10.386018)
	15	(166, 18.819954)	(533, 18.035512)	(656, 14.98909)	(878, 12.661607)
	20	(166, 24.10867)	(533, 22.786093)	(656, 18.558893)	(878, 15.229757)
RD	1	(35, 4.760348)	(109, 6.44393)	(108, 7.065213)	(94, 7.287121)
	2	(42, 5.93591)	(147, 7.444798)	(305, 7.930402)	(347, 7.920304)
	5	(59, 7.972565)	(256, 9.458135)	(514, 9.439179)	(723, 8.825496)
	10	(82, 14.790045)	(261, 15.718018)	(653, 13.987663)	(807, 12.326806)
	15	(113, 18.800661)	(315, 18.947982)	(658, 16.484998)	(900, 13.760862)
	20	(108, 25.363641)	(340, 25.863805)	(566, 20.477926)	(806, 16.893236)

Table 7. The full results of the main experiments on *relato*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(18200, 20.066584)	(1525, 10.278747)	(1093, 9.362024)	(732, 8.8609)
	2	(18200, 30.911228)	(1631, 10.966134)	(1081, 9.880414)	(601, 8.934576)
	5	(17886, 37.100711)	(1769, 11.868651)	(1170, 10.131934)	(727, 9.160244)
	10	(17886, 47.582482)	(1815, 12.89966)	(1228, 10.930069)	(724, 9.874507)
	15	(17886, 59.291739)	(1634, 14.067592)	(1221, 12.1711)	(737, 10.838254)
	20	(17886, 71.037556)	(1634, 15.437461)	(1228, 13.320627)	(756, 11.759433)
EQ	1	N/A	N/A	N/A	N/A
	2	(18200, 31.367987)	(1631, 10.950923)	(1081, 9.631465)	(601, 8.898312)
	5	(18200, 35.502089)	(1777, 11.500195)	(1111, 10.015313)	(675, 9.169323)
	10	(17886, 47.871221)	(1618, 12.671074)	(1259, 10.910955)	(753, 9.767921)
	15	(17886, 57.456869)	(1815, 14.061171)	(1236, 11.888506)	(727, 10.982649)
	20	(17886, 71.596376)	(1634, 15.462811)	(1236, 12.980841)	(748, 11.536748)
II	1	(18200, 18.671986)	(1525, 9.813701)	(860, 9.093311)	(510, 8.63311)
	2	(18200, 23.279586)	(1698, 10.157537)	(862, 9.126792)	(537, 8.703942)
	5	(17886, 29.692579)	(1514, 10.802643)	(1083, 9.729115)	(570, 9.060151)
	10	(17886, 40.454163)	(1508, 12.003224)	(979, 10.872554)	(571, 9.79806)
	15	(17886, 52.286336)	(1586, 13.291565)	(1210, 11.522062)	(573, 10.516353)
	20	(17886, 62.886783)	(1537, 15.036476)	(1187, 12.597883)	(553, 11.15737)
IO	1	(3932, 19.492647)	(1398, 10.281061)	(1093, 9.361074)	(732, 8.828502)
	2	(3731, 23.300827)	(1554, 10.593149)	(1080, 9.357446)	(770, 9.018518)
	5	(3725, 29.477057)	(1542, 11.187701)	(1155, 9.99313)	(798, 9.323371)
	10	(3725, 39.646281)	(1567, 12.319004)	(1170, 10.702775)	(738, 9.72672)
	15	(3725, 50.968981)	(1443, 13.853482)	(1170, 11.932157)	(788, 10.766915)
	20	(3725, 61.487066)	(1499, 15.024706)	(1173, 12.932639)	(802, 11.435084)
NT	1	(3713, 15.530225)	(1048, 9.655758)	(777, 8.969255)	(495, 8.575624)
	2	(3838, 22.892191)	(1259, 11.657735)	(759, 10.429413)	(554, 9.588718)
	5	(3906, 42.422152)	(1374, 16.689715)	(717, 13.836441)	(652, 12.155182)
	10	(3751, 77.338054)	(1407, 25.30496)	(694, 20.404779)	(697, 17.628668)
	15	(3792, 77.208547)	(1445, 23.562442)	(815, 18.741732)	(736, 16.094562)
	20	(3792, 88.151785)	(1566, 24.759263)	(746, 19.567629)	(744, 16.827505)
NE	1	(719, 8.593711)	(610, 7.798539)	(375, 7.781)	(657, 7.841317)
	2	(719, 10.628516)	(610, 8.030336)	(375, 7.939821)	(657, 7.975527)
	5	(719, 16.820136)	(610, 8.773347)	(375, 8.54328)	(657, 8.386603)
	10	(1565, 27.174709)	(823, 9.991018)	(539, 9.470157)	(755, 9.209895)
	15	(719, 37.641159)	(610, 11.284551)	(375, 10.396356)	(657, 9.836579)
	20	(719, 47.937585)	(610, 12.481733)	(375, 11.305846)	(657, 10.579446)
RD	1	(26, 13.311316)	(53, 9.054355)	(45, 8.633299)	(56, 8.333059)
	2	(133, 15.341061)	(203, 9.317372)	(202, 8.856714)	(109, 8.478147)
	5	(1028, 19.566863)	(348, 9.954583)	(347, 9.187858)	(207, 8.818307)
	10	(1123, 32.759762)	(403, 11.688949)	(537, 10.80347)	(229, 9.698891)
	15	(1417, 40.345749)	(503, 12.404703)	(482, 11.102026)	(282, 10.363468)
	20	(879, 52.582941)	(518, 13.748626)	(502, 12.081631)	(336, 11.073083)

Table 8. The full results of the main experiments on *slashdot*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(3078, 9.137355)	(6872, 23.077852)	(3216, 28.016744)	(1601, 31.364135)
	2	(3078, 15.931743)	(6872, 35.356373)	(3216, 34.519191)	(2532, 34.329742)
	5	(3078, 22.583234)	(7438, 46.274978)	(3717, 41.788776)	(2658, 39.501804)
	10	(2942, 33.817354)	(7410, 67.306994)	(3689, 52.481098)	(3066, 47.082249)
	15	(2942, 46.665795)	(7376, 89.841317)	(3760, 66.716082)	(3237, 55.769771)
	20	(2942, 57.968247)	(7487, 111.159931)	(3786, 79.026608)	(3260, 66.239228)
EQ	1	N/A	N/A	N/A	N/A
	2	(3078, 16.044073)	(6872, 35.108201)	(3216, 33.769681)	(2532, 33.472693)
	5	(3078, 20.728486)	(6977, 43.846302)	(3393, 39.830286)	(2466, 37.913488)
	10	(2942, 33.712189)	(7387, 65.986137)	(3705, 52.399195)	(3076, 47.011571)
	15	(2942, 43.736657)	(7410, 83.202126)	(3877, 64.562998)	(2991, 55.601181)
	20	(2942, 57.613948)	(7376, 109.244064)	(3694, 78.403743)	(3278, 66.61477)
II	1	(3078, 8.383145)	(6872, 21.465917)	(3216, 26.426679)	(2381, 29.018141)
	2	(3078, 13.202961)	(6977, 29.534145)	(3393, 30.959716)	(2445, 31.939913)
	5	(2942, 20.100729)	(7387, 41.521061)	(3705, 38.231511)	(2989, 36.817633)
	10	(2942, 31.696554)	(7376, 61.768423)	(3694, 51.451934)	(3278, 45.83766)
	15	(2942, 44.12425)	(7487, 82.986386)	(3786, 62.135343)	(3260, 53.732327)
	20	(2942, 56.538565)	(7487, 104.331364)	(3819, 75.139627)	(3260, 63.18732)
IO	1	(419, 9.144208)	(2292, 23.211475)	(2594, 27.894258)	(1601, 30.808521)
	2	(425, 13.140243)	(2464, 30.368479)	(2583, 31.953489)	(2105, 33.214502)
	5	(439, 20.094935)	(2403, 43.179821)	(2345, 38.853809)	(2286, 37.464285)
	10	(447, 30.193815)	(2458, 60.519335)	(2342, 50.122045)	(2339, 45.529253)
	15	(409, 41.46253)	(2458, 82.493371)	(2373, 64.779021)	(2129, 57.230257)
	20	(409, 52.13128)	(2435, 99.477884)	(2252, 76.79444)	(2127, 65.92331)
NT	1	(365, 25.020149)	(2017, 32.740586)	(2035, 32.208022)	(1695, 32.031095)
	2	(380, 41.080853)	(2017, 46.1374)	(2170, 41.072028)	(1874, 38.400952)
	5	(391, 81.016286)	(2240, 81.933398)	(2385, 63.984136)	(2047, 55.264581)
	10	(391, 133.656234)	(2378, 138.864884)	(2562, 105.211061)	(1881, 88.877944)
	15	(412, 136.512992)	(2381, 145.23193)	(2699, 103.561808)	(1920, 84.221371)
	20	(415, 147.788968)	(2519, 163.972721)	(2715, 115.110821)	(1935, 92.756394)
NE	1	(146, 8.032294)	(116, 20.242908)	(142, 23.902179)	(196, 25.865214)
	2	(146, 10.182026)	(116, 23.973655)	(142, 26.298077)	(196, 27.51254)
	5	(146, 16.575301)	(116, 35.209148)	(142, 33.098032)	(196, 32.672331)
	10	(241, 27.0287)	(492, 54.028916)	(581, 45.354465)	(388, 41.016239)
	15	(146, 38.067553)	(116, 72.680811)	(142, 55.833599)	(196, 49.720338)
	20	(146, 48.803032)	(116, 91.74155)	(142, 67.307069)	(196, 58.03318)
RD	1	(66, 8.209677)	(99, 21.610461)	(11, 26.46422)	(2, 28.758133)
	2	(56, 10.330515)	(121, 25.326023)	(122, 28.75007)	(67, 30.611359)
	5	(113, 14.586695)	(243, 32.846758)	(275, 33.366299)	(79, 33.651221)
	10	(174, 28.085976)	(332, 57.08309)	(297, 47.721802)	(137, 44.519811)
	15	(176, 36.432143)	(385, 70.733631)	(278, 56.186387)	(369, 50.485354)
	20	(185, 49.585751)	(625, 94.054384)	(429, 69.665654)	(338, 60.714386)

Table 9. The full results of the main experiments on *syracuse*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(13584, 42.918833)	(6208, 37.637487)	(4041, 33.792637)	(3162, 31.89478)
	2	(13584, 67.972448)	(6208, 46.788955)	(4041, 37.013729)	(3455, 30.918941)
	5	(13575, 86.737187)	(6752, 57.790389)	(3823, 39.597373)	(3831, 32.481303)
	10	(13599, 119.925492)	(6726, 73.331638)	(4003, 45.031304)	(3831, 34.853393)
	15	(13599, 157.43262)	(6609, 92.880868)	(4032, 53.166402)	(3883, 37.619268)
	20	(13599, 194.824569)	(6768, 108.651844)	(3854, 59.337779)	(3883, 39.708514)
EQ	1	N/A	N/A	N/A	N/A
	2	(13584, 68.083202)	(6208, 46.390997)	(4041, 37.020529)	(3455, 30.987662)
	5	(13534, 81.61071)	(6677, 54.475581)	(3832, 39.988916)	(3885, 32.167532)
	10	(13575, 119.566966)	(6752, 73.701732)	(3896, 44.986285)	(3831, 34.600187)
	15	(13599, 152.357478)	(6707, 87.71731)	(4003, 52.026007)	(4122, 37.404323)
	20	(13599, 194.678042)	(6609, 111.009044)	(4032, 58.400001)	(3885, 40.207563)
II	1	(13584, 39.784097)	(6208, 35.406014)	(4041, 33.207643)	(3155, 30.838721)
	2	(13534, 53.167858)	(6677, 40.995739)	(3832, 33.814285)	(3050, 29.701283)
	5	(13575, 73.246415)	(6752, 51.249537)	(3896, 37.390047)	(3634, 31.497672)
	10	(13599, 106.95152)	(6609, 68.252545)	(4032, 44.07337)	(3231, 34.835858)
	15	(13599, 141.721769)	(6823, 85.316382)	(4032, 49.657822)	(3667, 35.776236)
	20	(13599, 177.902717)	(6823, 102.361751)	(3837, 55.366453)	(3667, 38.565606)
IO	1	(1180, 36.660868)	(1394, 34.937324)	(2062, 34.445082)	(3162, 32.699253)
	2	(1475, 49.889538)	(1401, 41.541774)	(2236, 34.817455)	(2604, 31.520299)
	5	(1475, 69.707858)	(1732, 51.103882)	(2536, 39.362832)	(3156, 32.904191)
	10	(1579, 99.048102)	(1743, 67.193724)	(2516, 43.292258)	(3219, 33.990909)
	15	(1556, 137.172782)	(1855, 87.183607)	(2375, 50.947088)	(3754, 37.311674)
	20	(1556, 172.371989)	(1698, 104.317272)	(2593, 56.394751)	(3859, 39.280838)
NT	1	(1577, 47.474689)	(2267, 35.795039)	(2200, 31.486294)	(2080, 28.850227)
	2	(2078, 74.812402)	(2283, 47.830792)	(2509, 36.376688)	(2133, 30.553379)
	5	(2188, 141.600142)	(2510, 76.865257)	(2699, 48.753152)	(2611, 35.919703)
	10	(2188, 230.624679)	(2515, 122.091206)	(2866, 72.79768)	(2667, 50.070531)
	15	(2035, 248.787257)	(2583, 127.339392)	(2809, 69.564209)	(2794, 44.51512)
	20	(2038, 280.394172)	(2566, 143.537395)	(2907, 74.808112)	(2757, 47.333103)
NE	1	(329, 21.047036)	(438, 24.928693)	(300, 26.296863)	(176, 26.673974)
	2	(329, 28.007259)	(438, 28.143183)	(300, 27.413802)	(176, 27.1633)
	5	(329, 45.821058)	(438, 37.908263)	(300, 30.91087)	(176, 28.71001)
	10	(574, 78.649986)	(702, 54.212184)	(917, 37.518702)	(439, 31.280486)
	15	(329, 110.359272)	(438, 70.787691)	(300, 42.592056)	(176, 34.128857)
	20	(329, 139.094946)	(438, 88.008542)	(300, 48.424284)	(176, 36.65451)
RD	1	(0, 28.390049)	(1, 31.537561)	(116, 30.250711)	(72, 28.421338)
	2	(6, 34.359303)	(75, 34.768408)	(9, 31.355581)	(493, 28.907215)
	5	(7, 46.523486)	(82, 41.281639)	(557, 33.869331)	(983, 29.929439)
	10	(21, 86.319679)	(158, 62.431811)	(428, 40.812047)	(989, 33.312353)
	15	(22, 108.426765)	(197, 73.398591)	(418, 44.921136)	(1245, 35.22558)
	20	(37, 146.327001)	(333, 92.227997)	(849, 51.733232)	(1628, 37.525779)

Table 10. The full results of the main experiments on *gowalla*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(2156, 17.250765)	(4639, 34.457268)	(4558, 50.228279)	(3348, 62.148935)
	2	(2156, 28.167689)	(4639, 51.946555)	(4558, 68.217324)	(3348, 79.537184)
	5	(2169, 39.767643)	(4828, 70.161341)	(4815, 88.415418)	(3600, 95.969509)
	10	(2209, 59.279109)	(4991, 104.108203)	(5175, 122.547026)	(4051, 127.31719)
	15	(2169, 80.004062)	(4991, 136.618916)	(5372, 159.781998)	(4617, 160.744555)
	20	(2181, 101.828541)	(4991, 172.50932)	(5372, 199.099672)	(4652, 189.724944)
EQ	1	N/A	N/A	N/A	N/A
	2	(2156, 28.096701)	(4639, 52.097043)	(4558, 68.635538)	(3348, 78.514117)
	5	(2169, 36.565866)	(4639, 64.364222)	(4720, 81.717093)	(3480, 90.34128)
	10	(2169, 59.696621)	(4656, 102.948816)	(5221, 121.257137)	(3851, 125.697294)
	15	(2209, 76.146773)	(4991, 129.479459)	(5175, 152.444814)	(3853, 152.075571)
	20	(2241, 99.555031)	(4991, 168.191196)	(5372, 196.499618)	(4051, 188.770842)
II	1	(2156, 15.817059)	(4639, 33.14413)	(4558, 48.953266)	(3348, 61.198515)
	2	(2169, 23.972167)	(4639, 45.983909)	(4720, 63.230449)	(3480, 73.074145)
	5	(2169, 36.35377)	(4656, 65.563888)	(5221, 84.586214)	(3851, 91.057811)
	10	(2241, 60.956302)	(4991, 98.907459)	(5372, 121.011317)	(4051, 122.64463)
	15	(2173, 77.744099)	(4991, 132.748716)	(5372, 158.346635)	(4652, 154.625164)
	20	(2340, 100.499021)	(4991, 168.338879)	(5372, 195.343929)	(4599, 185.53489)
IO	1	(585, 15.390641)	(1665, 33.078106)	(2011, 49.502759)	(2408, 62.065986)
	2	(588, 23.13957)	(1653, 44.773951)	(1850, 62.257377)	(2217, 73.81874)
	5	(584, 33.783655)	(1524, 62.245573)	(2022, 82.289333)	(2352, 91.868419)
	10	(574, 51.673385)	(1516, 90.121998)	(2173, 113.223071)	(2593, 119.825747)
	15	(580, 70.769903)	(1516, 121.838574)	(2169, 145.921236)	(2342, 150.819693)
	20	(582, 88.914154)	(1517, 149.250357)	(2095, 177.999262)	(2400, 180.99605)
NT	1	(476, 58.926643)	(1558, 64.954823)	(1915, 71.927896)	(1748, 77.397144)
	2	(545, 99.766209)	(1596, 101.376652)	(2067, 102.452668)	(2105, 100.385736)
	5	(589, 200.149661)	(1748, 191.729642)	(2353, 177.370222)	(2209, 159.370979)
	10	(589, 334.970778)	(1870, 319.254124)	(2590, 288.175274)	(2651, 250.22854)
	15	(603, 325.665102)	(1940, 317.799222)	(2678, 293.884366)	(2481, 256.016475)
	20	(607, 346.781807)	(1940, 349.985538)	(2790, 324.063543)	(2600, 285.047393)
NE	1	(309, 13.788904)	(216, 28.110017)	(190, 43.50338)	(113, 55.991149)
	2	(309, 17.40175)	(216, 33.555561)	(190, 49.712142)	(113, 62.696089)
	5	(309, 28.33458)	(216, 50.846547)	(190, 68.710448)	(113, 79.404135)
	10	(329, 47.057335)	(695, 79.058022)	(434, 102.175082)	(392, 108.591515)
	15	(309, 65.575881)	(216, 108.238793)	(190, 132.052858)	(113, 137.83236)
	20	(309, 83.175236)	(216, 137.192202)	(190, 163.539437)	(113, 166.78048)
RD	1	(0, 14.388134)	(0, 31.767857)	(0, 48.771893)	(20, 62.0023)
	2	(1, 18.149702)	(5, 37.393978)	(55, 55.114615)	(116, 67.78141)
	5	(2, 25.468295)	(12, 48.794362)	(66, 67.796522)	(26, 79.191418)
	10	(12, 47.65298)	(19, 85.499047)	(100, 108.456509)	(81, 115.707457)
	15	(13, 61.772505)	(46, 105.917868)	(104, 130.881632)	(270, 137.866356)
	20	(17, 84.348169)	(32, 140.406237)	(201, 168.625494)	(217, 172.471614)

Table 11. The full results of the main experiments on *twitter*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(5792, 32.22977)	(25273, 32.191346)	(12588, 38.239932)	(1068, 44.567476)
	2	(5406, 51.697749)	(25523, 48.436832)	(14172, 52.23859)	(993, 54.257068)
	5	(4919, 69.780089)	(25445, 66.888133)	(14820, 68.372353)	(1085, 66.340954)
	10	(6309, 105.836748)	(25574, 100.419997)	(14715, 101.620759)	(149189, 100.941726)
	15	(7288, 135.667083)	(25574, 132.941585)	(15129, 130.15164)	(149188, 124.15587)
	20	(7494, 170.204321)	(25672, 168.079383)	(17087, 165.087614)	(149176, 156.316675)
EQ	1	N/A	N/A	N/A	N/A
	2	(5406, 51.869004)	(25523, 48.432708)	(14172, 52.378278)	(993, 54.443817)
	5	(6741, 64.559927)	(25445, 60.918173)	(15350, 63.883068)	(1507, 63.765601)
	10	(6986, 101.530793)	(26344, 98.349682)	(14347, 101.317042)	(148768, 99.605697)
	15	(6992, 129.077426)	(25586, 126.146423)	(14669, 129.259442)	(1929, 107.28004)
	20	(7047, 168.380577)	(25586, 166.89998)	(18161, 161.833963)	(2362, 134.152945)
II	1	(5792, 30.174098)	(25273, 31.20066)	(12588, 37.185525)	(1887, 43.346764)
	2	(5792, 43.317874)	(25453, 43.40582)	(14225, 48.705107)	(2014, 50.856149)
	5	(5948, 63.137128)	(25465, 64.157894)	(19593, 65.183179)	(1495, 65.033025)
	10	(6385, 96.344019)	(25398, 97.407013)	(22378, 99.228458)	(119139, 88.479309)
	15	(6380, 129.943815)	(25692, 133.076064)	(17087, 127.554944)	(1930, 110.292199)
	20	(7090, 162.720907)	(25684, 167.108386)	(14767, 158.833008)	(119139, 135.438184)
IO	1	(4675, 29.207645)	(8406, 31.45901)	(13057, 36.980751)	(1068, 43.652551)
	2	(3658, 41.505399)	(20216, 42.844049)	(13337, 47.190616)	(1611, 51.012466)
	5	(5096, 59.139864)	(20619, 61.069498)	(14106, 63.702171)	(148768, 69.591456)
	10	(5091, 88.221983)	(8406, 91.471204)	(15410, 90.407044)	(149176, 94.918306)
	15	(5087, 119.665234)	(20720, 121.399374)	(17017, 117.710842)	(149188, 121.505219)
	20	(5264, 150.64538)	(8406, 155.302002)	(16280, 146.199353)	(149190, 147.688692)
NT	1	(1347, 85.938826)	(2766, 75.619618)	(11628, 66.656098)	(0, 59.299755)
	2	(1347, 121.679605)	(1690, 86.804609)	(8219, 82.54612)	(930, 81.934731)
	5	(1447, 206.327432)	(3680, 135.998975)	(4050, 110.855094)	(743, 124.472368)
	10	(1706, 314.501682)	(6224, 243.396519)	(10790, 230.891864)	(710, 190.639052)
	15	(1992, 390.721497)	(6225, 302.550387)	(27415, 267.379108)	(1697, 203.172245)
	20	(2121, 417.767729)	(6225, 342.265757)	(10872, 291.925606)	(847, 224.827101)
NE	1	(18, 23.140345)	(1605, 30.113673)	(15, 35.068699)	(0, 41.998658)
	2	(18, 29.351086)	(1605, 36.695096)	(15, 40.527794)	(0, 47.790536)
	5	(18, 48.526995)	(1605, 54.255724)	(15, 56.555583)	(0, 60.634051)
	10	(649, 80.425189)	(2740, 84.403829)	(15, 82.86777)	(0, 83.096467)
	15	(18, 109.869827)	(1605, 114.536891)	(15, 109.623321)	(0, 105.489152)
	20	(18, 140.707342)	(1605, 148.581678)	(15, 137.350974)	(0, 127.577672)
RD	1	(0, 24.450804)	(1, 31.233218)	(-11, 36.223551)	(-48, 41.869068)
	2	(0, 30.485499)	(2, 37.26326)	(0, 41.262597)	(25, 45.953401)
	5	(0, 42.50117)	(2, 49.479786)	(0, 51.695204)	(0, 54.720054)
	10	(1, 80.653146)	(1, 85.758497)	(17, 84.920984)	(9, 82.029572)
	15	(0, 102.999965)	(4, 108.338868)	(111, 104.065065)	(62, 98.417199)
	20	(1, 139.453087)	(10, 146.111188)	(3, 135.508874)	(25, 124.279489)

Table 12. The full results of the main experiments on *stanford*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(34727, 96.815317)	(13903, 88.077645)	(7313, 79.695829)	(7933, 74.58187)
	2	(34727, 163.800204)	(13903, 101.660277)	(7358, 84.292301)	(8619, 75.905248)
	5	(35472, 210.667127)	(13712, 116.792159)	(7474, 90.294164)	(8364, 79.933056)
	10	(35483, 296.104172)	(13549, 141.735323)	(6773, 101.146874)	(9058, 85.75348)
	15	(35483, 379.843322)	(13549, 167.357328)	(6773, 112.453282)	(8655, 92.784557)
	20	(35483, 470.990498)	(13549, 193.362098)	(6773, 123.598105)	(8801, 99.734185)
EQ	1	N/A	N/A	N/A	N/A
	2	(34727, 162.052522)	(13903, 101.409627)	(7358, 84.475508)	(8619, 75.585538)
	5	(35057, 196.236969)	(13650, 112.538271)	(6727, 89.331761)	(8552, 79.23621)
	10	(35472, 291.866031)	(13549, 141.026136)	(6823, 100.507107)	(8891, 85.741432)
	15	(35483, 363.928129)	(13549, 163.431182)	(6761, 110.469261)	(8861, 91.665476)
	20	(35483, 467.948006)	(13549, 193.633128)	(6773, 123.979598)	(8967, 99.959984)
II	1	(34727, 91.237944)	(13903, 86.955482)	(7313, 79.52332)	(7933, 74.978634)
	2	(35057, 126.056803)	(13650, 96.646623)	(7361, 82.315159)	(8332, 75.345899)
	5	(35472, 175.673164)	(13549, 111.462079)	(7773, 89.368702)	(8364, 78.324265)
	10	(35483, 259.633478)	(13549, 135.378938)	(7078, 100.353824)	(8260, 86.502816)
	15	(35483, 347.251763)	(13549, 164.680759)	(7212, 112.436771)	(8294, 92.507716)
	20	(35442, 437.978777)	(13549, 188.161939)	(7212, 123.091461)	(8625, 99.140762)
IO	1	(5661, 89.014214)	(7077, 84.894401)	(5199, 83.422277)	(8145, 75.072201)
	2	(5479, 121.469296)	(7999, 92.596306)	(5880, 82.015747)	(8581, 73.922073)
	5	(5502, 167.262149)	(8450, 107.182301)	(5533, 91.749191)	(8682, 78.988132)
	10	(5520, 246.015041)	(8261, 129.768289)	(5921, 98.238124)	(8921, 84.525209)
	15	(5796, 333.021418)	(8261, 154.97954)	(5878, 113.489638)	(9052, 91.156537)
	20	(5796, 413.023137)	(7483, 177.147368)	(6062, 121.723597)	(9059, 98.88832)
NT	1	(3382, 103.389162)	(5724, 79.779424)	(2916, 74.370836)	(5361, 71.278303)
	2	(3859, 151.221716)	(6139, 92.829653)	(3099, 79.956918)	(5771, 72.274644)
	5	(4147, 270.213349)	(7012, 123.380309)	(3480, 93.147245)	(5908, 79.698591)
	10	(4179, 466.206248)	(7186, 185.257056)	(4242, 127.623758)	(6223, 97.864621)
	15	(4418, 517.675057)	(7995, 189.778014)	(4095, 122.447309)	(6103, 93.907214)
	20	(4498, 597.433512)	(7995, 216.309984)	(4110, 133.193601)	(6092, 100.494656)
NE	1	(139, 63.555624)	(595, 70.558657)	(371, 69.325438)	(3312, 68.733193)
	2	(139, 79.795067)	(595, 73.237299)	(371, 71.77277)	(3312, 71.158174)
	5	(139, 127.806795)	(595, 87.703684)	(371, 78.094574)	(3312, 75.459431)
	10	(506, 208.08281)	(1191, 111.561699)	(814, 90.293125)	(4510, 81.541043)
	15	(139, 290.510849)	(595, 136.452374)	(371, 99.434331)	(3312, 86.7421)
	20	(139, 371.255455)	(595, 161.463131)	(371, 110.222559)	(3312, 96.512952)
RD	1	(0, 64.169277)	(31, 81.413712)	(11, 76.234492)	(0, 70.665266)
	2	(121, 79.942868)	(250, 85.861006)	(545, 78.40747)	(3264, 72.485616)
	5	(140, 112.099574)	(462, 95.675977)	(635, 82.484578)	(4441, 75.22764)
	10	(37, 210.442689)	(697, 126.084332)	(1648, 95.920044)	(4859, 86.439338)
	15	(208, 271.602123)	(727, 141.739601)	(1807, 103.595016)	(4414, 88.147885)
	20	(197, 367.440253)	(1038, 172.267636)	(1989, 116.029053)	(4467, 95.818715)

Table 13. The full results of the main experiments on *youtube*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

algorithm	$n_c$	$k = 5$	$k = 10$	$k = 15$	$k = 20$
BM	1	(69841, 184.947758)	(15865, 109.131924)	(6154, 125.102625)	(1973, 116.184614)
	2	(69841, 269.715721)	(16639, 156.3468)	(6487, 148.578884)	(2187, 136.397296)
	5	(70392, 333.232194)	(17250, 188.865752)	(6246, 172.212999)	(2336, 159.929409)
	10	(70184, 447.916909)	(17482, 263.394664)	(6246, 217.438621)	(2347, 198.744257)
	15	(70184, 559.750126)	(17482, 321.388279)	(5906, 267.584617)	(2299, 226.794706)
	20	(70184, 681.211728)	(17482, 392.373696)	(4467, 312.21477)	(2357, 269.380681)
EQ	1	N/A	N/A	N/A	N/A
	2	(69841, 270.361965)	(16639, 156.262437)	(6487, 149.014505)	(2187, 135.776025)
	5	(70289, 314.912242)	(17348, 175.188496)	(6508, 164.977351)	(2258, 150.627091)
	10	(69737, 444.372591)	(17482, 260.021884)	(6246, 215.380874)	(2342, 196.503726)
	15	(70184, 534.436413)	(17482, 310.851462)	(6246, 259.94217)	(2269, 222.622928)
	20	(70184, 670.27082)	(17482, 388.571692)	(5906, 317.5184)	(2257, 270.485292)
II	1	(69841, 179.602117)	(15865, 108.033626)	(6154, 124.044298)	(1973, 117.409596)
	2	(70289, 225.902993)	(16368, 134.849478)	(6237, 140.792145)	(1983, 132.427966)
	5	(69737, 285.287187)	(16158, 176.135094)	(6246, 169.299593)	(2217, 152.173485)
	10	(70184, 399.478906)	(16168, 246.115413)	(5906, 213.597636)	(2274, 193.611218)
	15	(70184, 526.861574)	(16216, 314.135171)	(4467, 258.704611)	(2329, 226.436015)
	20	(70184, 642.020926)	(16455, 375.499729)	(4620, 308.995176)	(2280, 262.455593)
IO	1	(2295, 115.656188)	(3453, 119.008855)	(3767, 112.720193)	(2021, 122.897098)
	2	(2208, 156.583749)	(3866, 141.172058)	(3597, 130.649717)	(2239, 140.72643)
	5	(1885, 217.510045)	(3806, 176.122573)	(3686, 156.575334)	(2248, 162.098473)
	10	(1710, 316.557355)	(3614, 232.498359)	(3711, 198.373934)	(2441, 194.604057)
	15	(818, 420.451756)	(3561, 293.285089)	(3590, 242.467404)	(2391, 232.632324)
	20	(710, 522.844322)	(3934, 349.380345)	(3640, 285.66923)	(2419, 267.734644)
NT	1	(3361, 154.290558)	(3616, 144.460126)	(2800, 137.186695)	(3539, 142.928956)
	2	(3271, 233.801483)	(3625, 188.470627)	(2784, 169.520057)	(3677, 168.023174)
	5	(3220, 439.065302)	(3811, 298.813281)	(3030, 251.15891)	(3874, 233.807214)
	10	(3494, 705.59448)	(3906, 473.593645)	(3109, 375.332806)	(3990, 342.674057)
	15	(3783, 804.524135)	(3967, 495.260585)	(3123, 389.246175)	(4078, 351.200492)
	20	(4008, 915.755914)	(4093, 554.369119)	(3147, 429.889279)	(4118, 386.540142)
NE	1	(682, 86.673368)	(648, 101.997978)	(1405, 109.180708)	(1452, 118.312682)
	2	(682, 106.525254)	(648, 118.811623)	(1405, 117.111967)	(1452, 125.247142)
	5	(682, 167.174618)	(648, 152.96458)	(1405, 142.058964)	(1452, 146.397903)
	10	(1344, 267.953063)	(947, 215.08867)	(1510, 181.730074)	(1819, 179.622152)
	15	(682, 371.214326)	(648, 279.089291)	(1405, 224.449483)	(1452, 216.560952)
	20	(682, 470.687674)	(648, 343.055558)	(1405, 265.112105)	(1452, 250.082739)
RD	1	(23, 89.965633)	(16, 102.005447)	(121, 112.442735)	(155, 122.04761)
	2	(51, 109.182972)	(366, 116.9455)	(966, 124.456227)	(779, 130.313734)
	5	(119, 150.46222)	(453, 142.383985)	(936, 139.941693)	(1387, 145.472471)
	10	(105, 275.956563)	(971, 226.873622)	(1564, 196.010391)	(1854, 196.772464)
	15	(159, 353.856702)	(996, 262.244178)	(1770, 232.126078)	(2292, 219.906269)
	20	(137, 469.818807)	(1264, 337.926391)	(2056, 290.098063)	(2632, 265.957037)

Table 14. The full results of the main experiments on *wikitalk*. For each algorithm, each considered  $k$  value, and each  $n_c$ , we report the performance (left) and the running time (right).

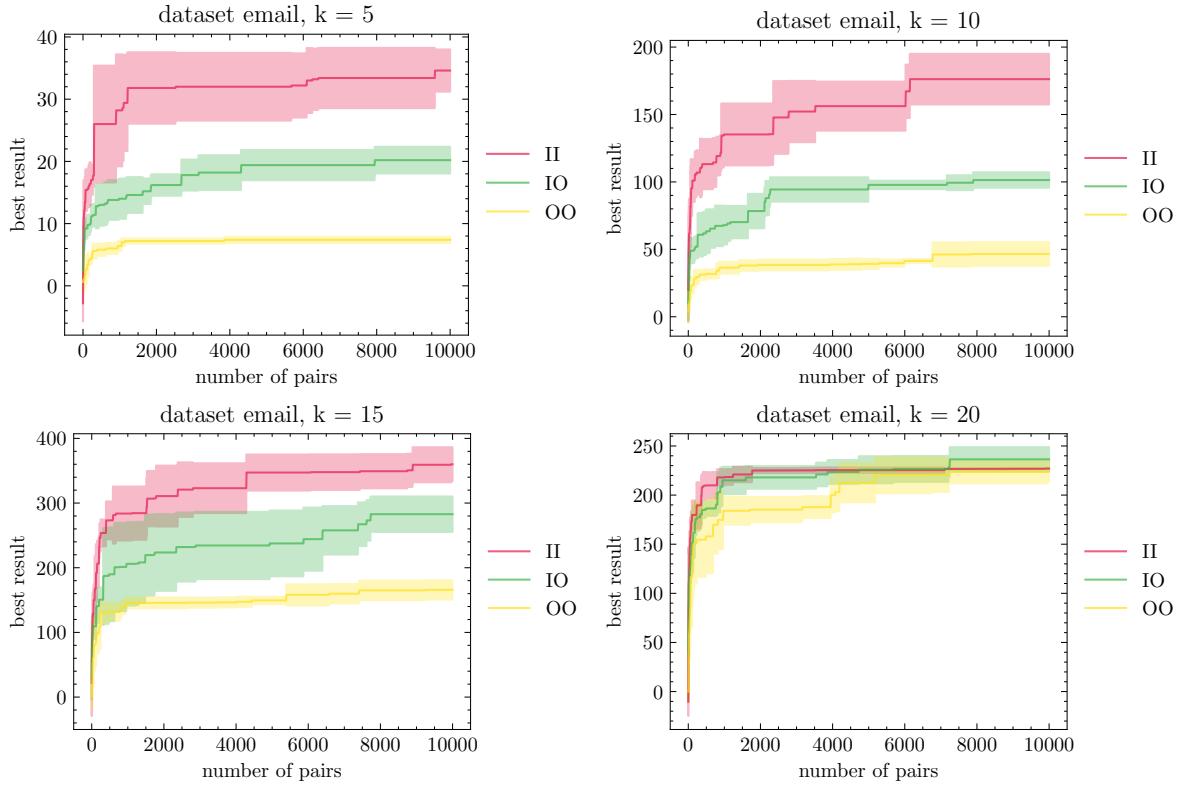


Fig. 1. The full results of the sampling experiments on *email*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

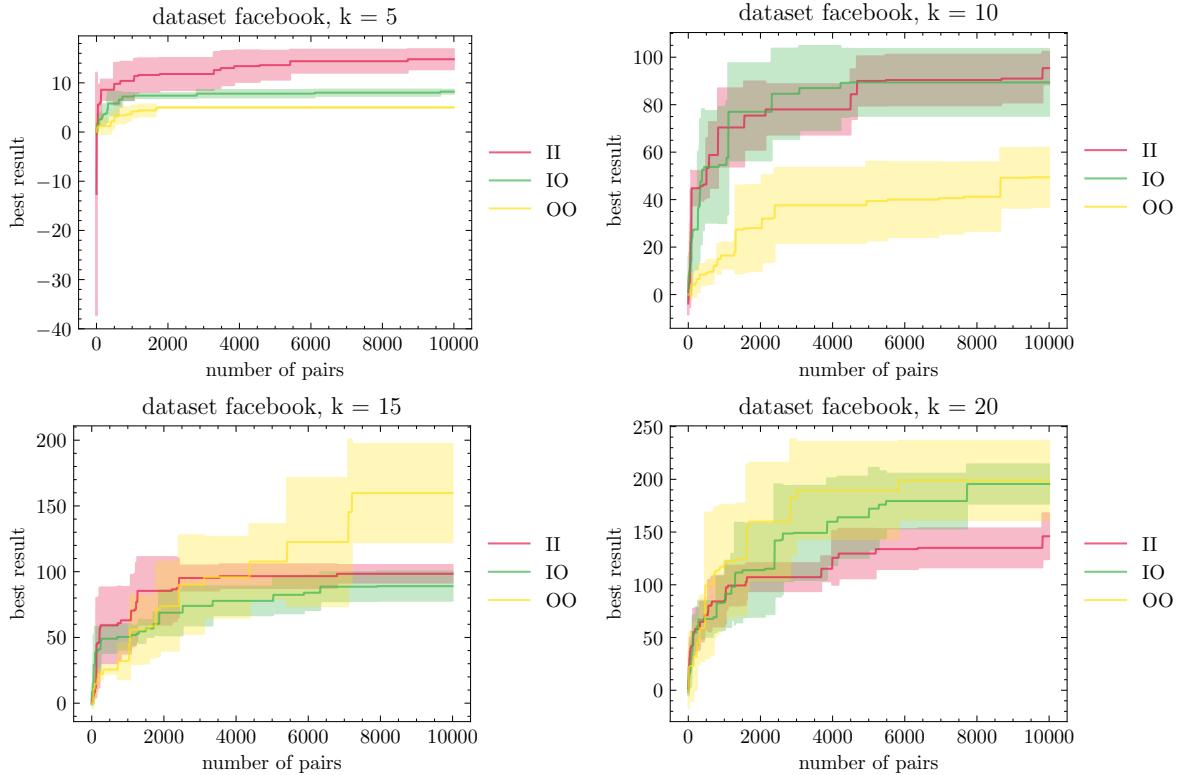


Fig. 2. The full results of the sampling experiments on *facebook*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

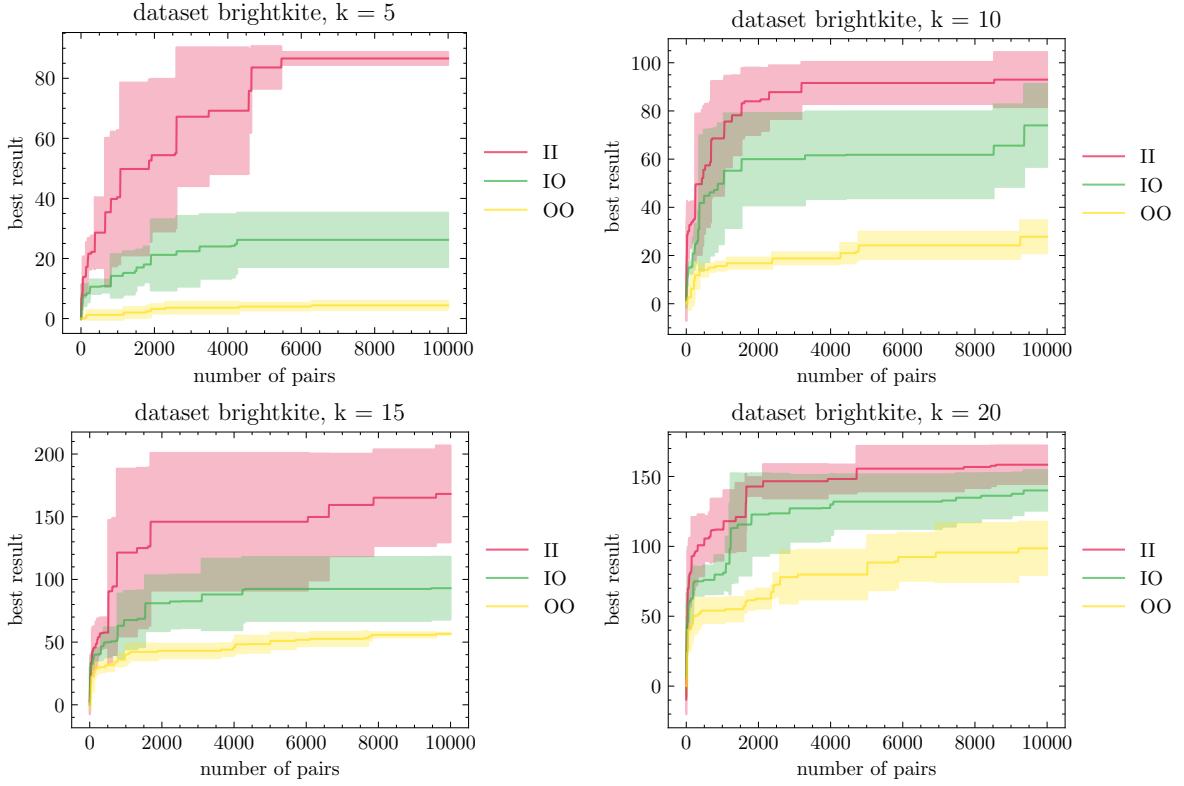


Fig. 3. The full results of the sampling experiments on *brightkite*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

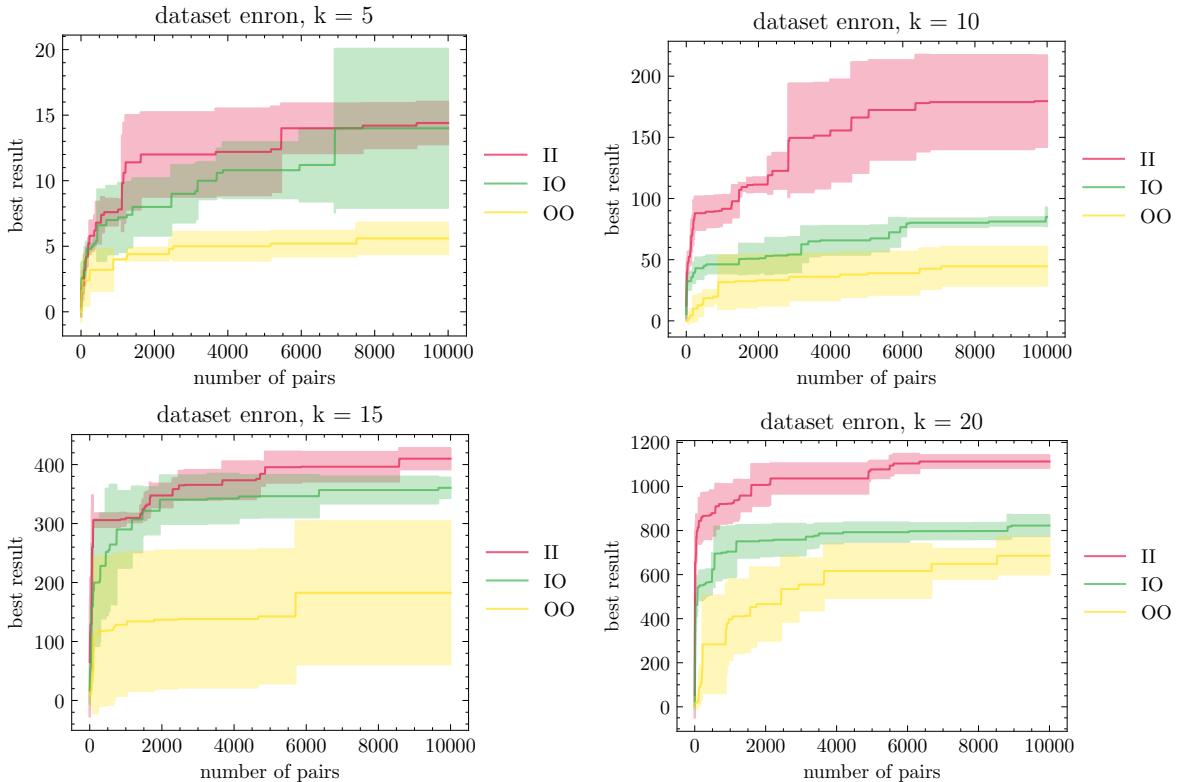


Fig. 4. The full results of the sampling experiments on *enron*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

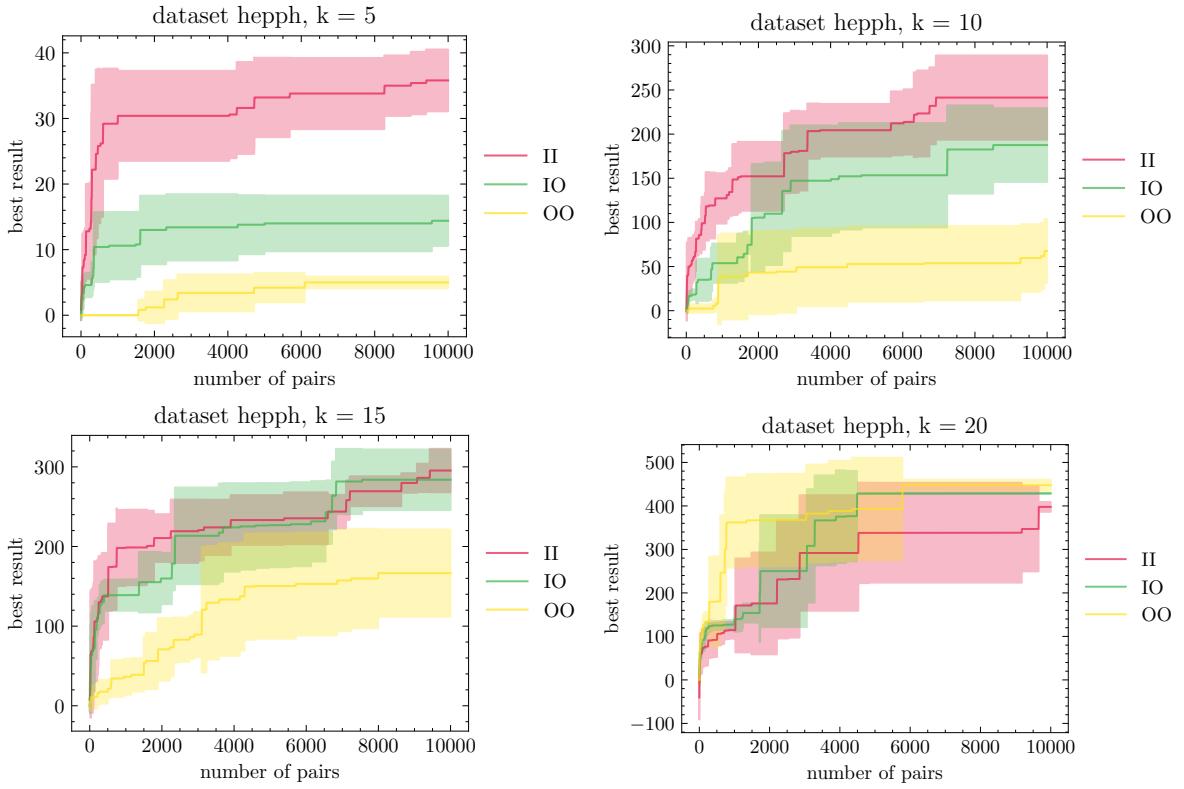


Fig. 5. The full results of the sampling experiments on *hepph*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

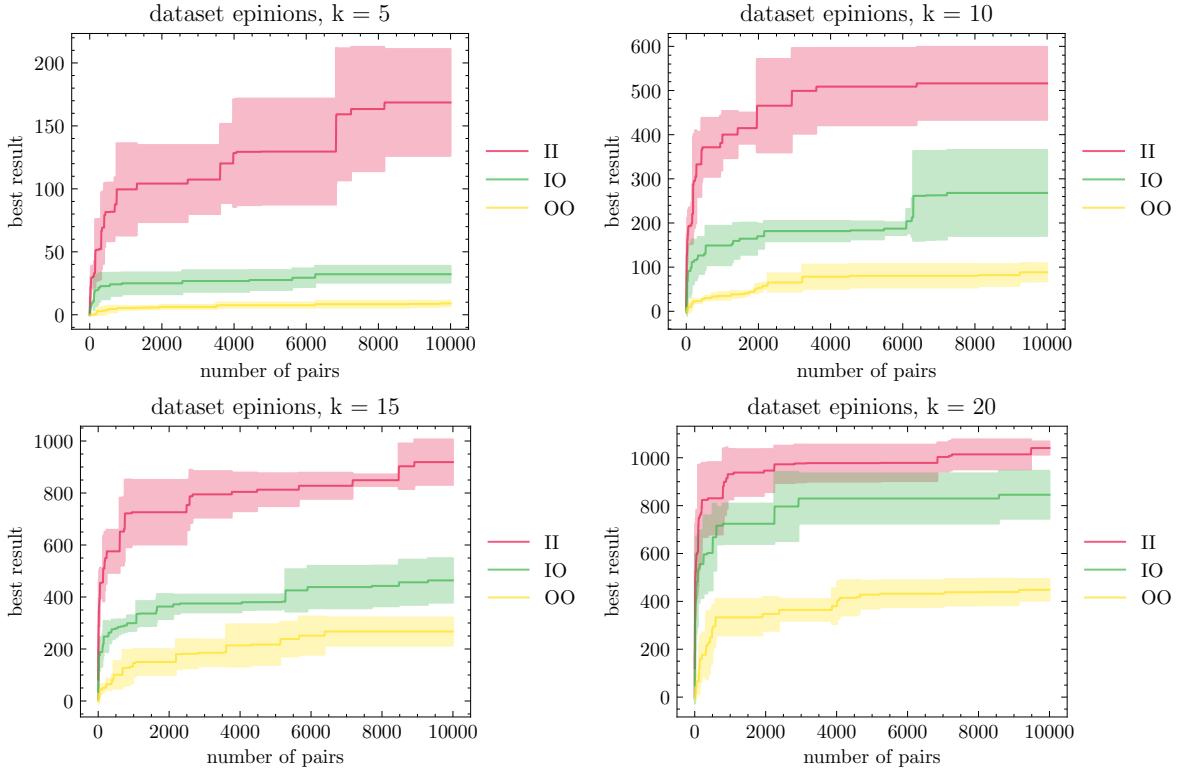


Fig. 6. The full results of the sampling experiments on *epinions*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

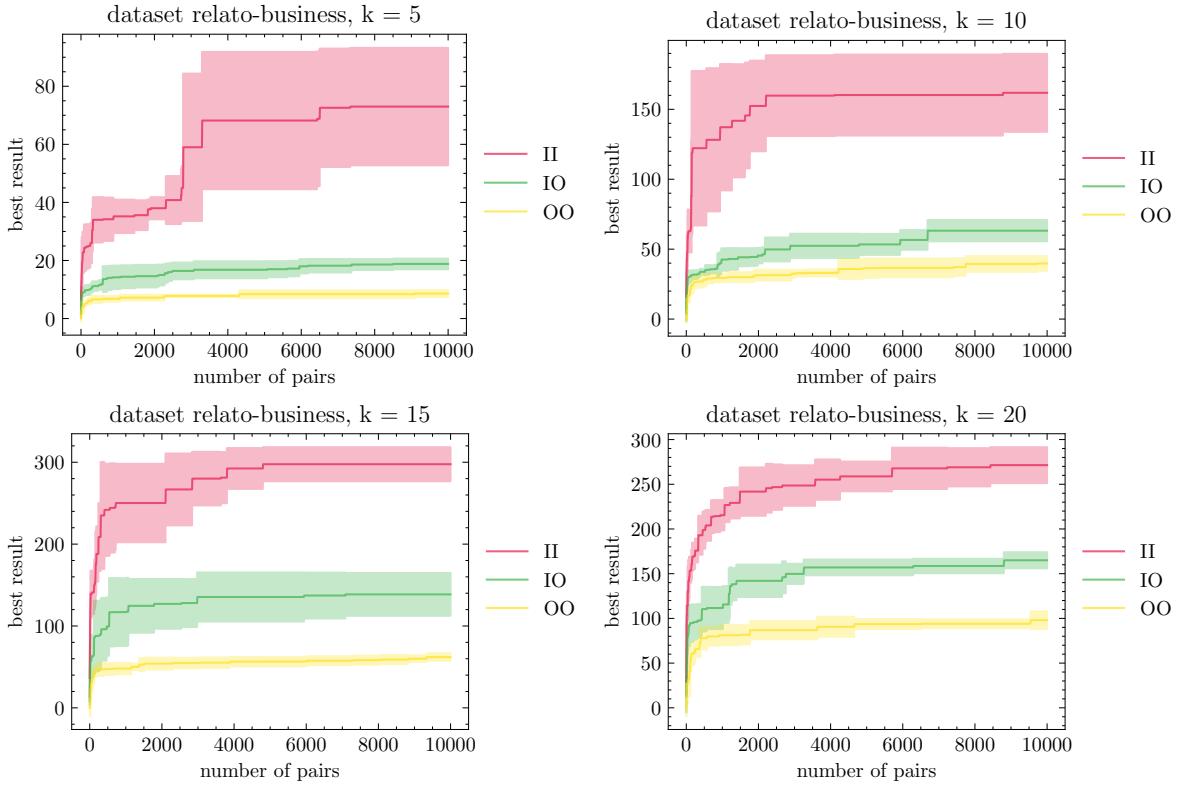


Fig. 7. The full results of the sampling experiments on *relato*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

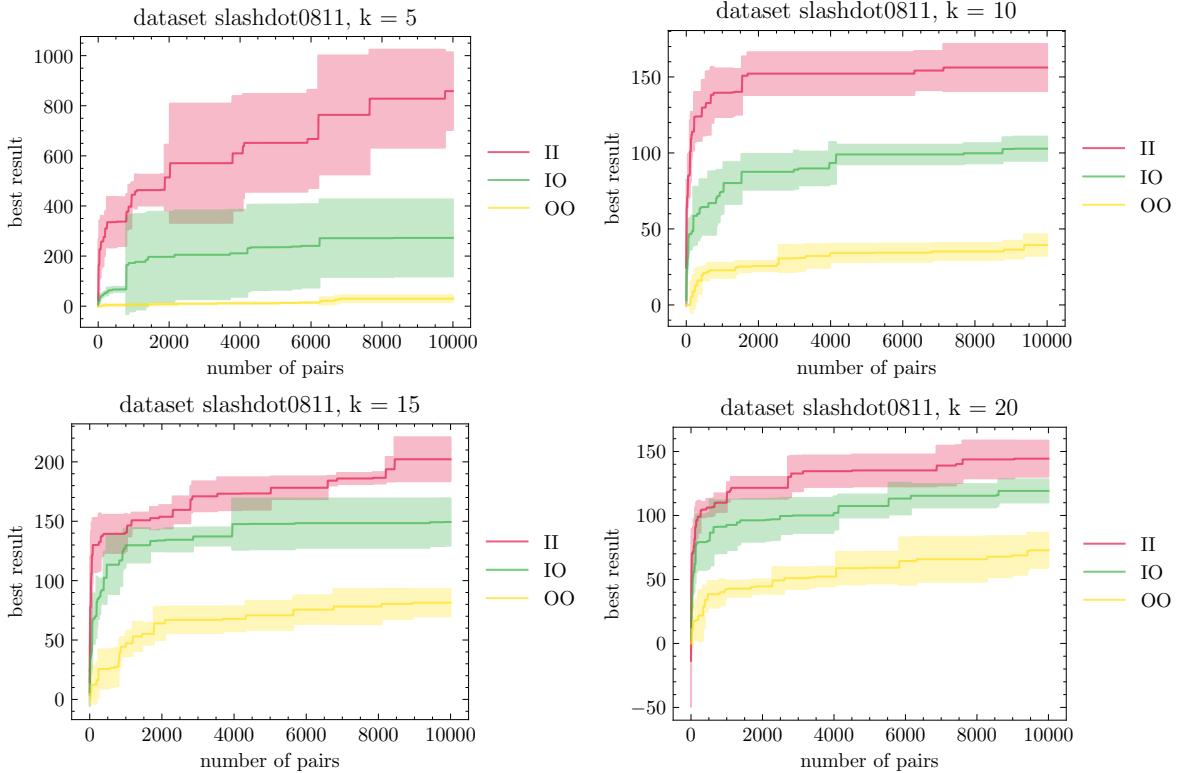


Fig. 8. The full results of the sampling experiments on *slashdot*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

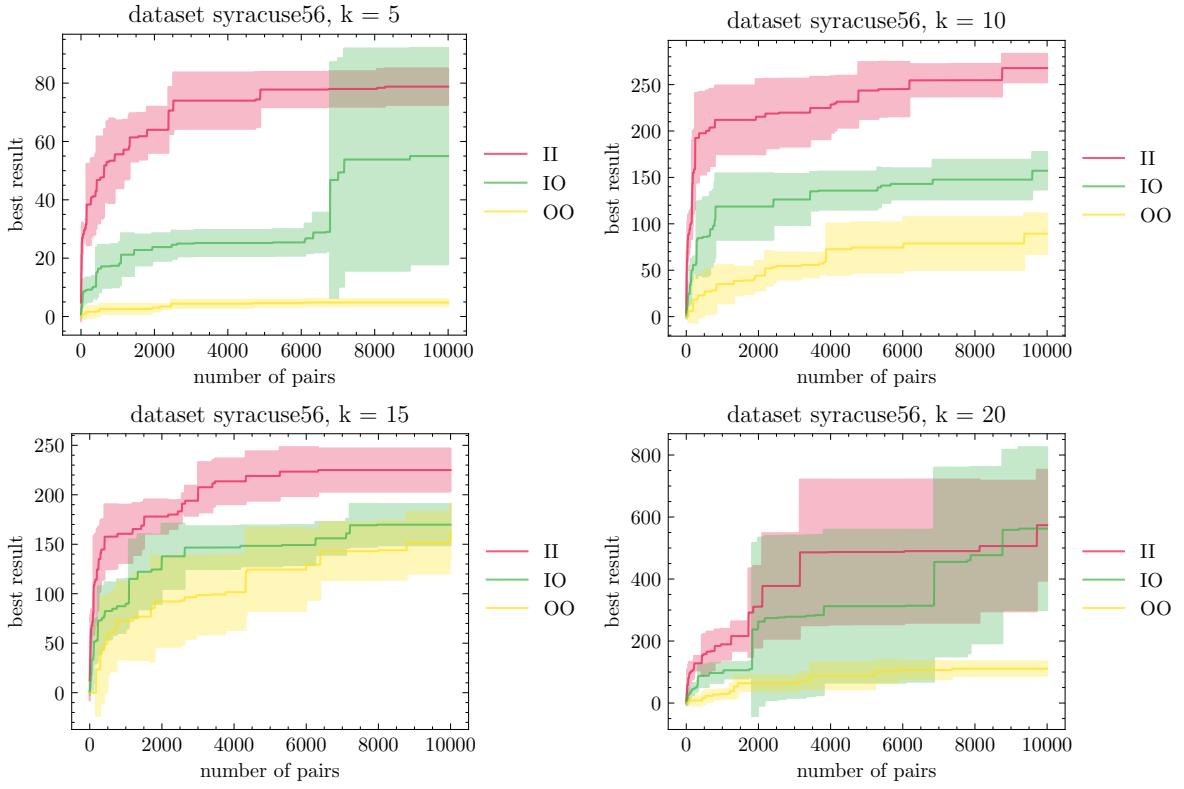


Fig. 9. The full results of the sampling experiments on *syracuse*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

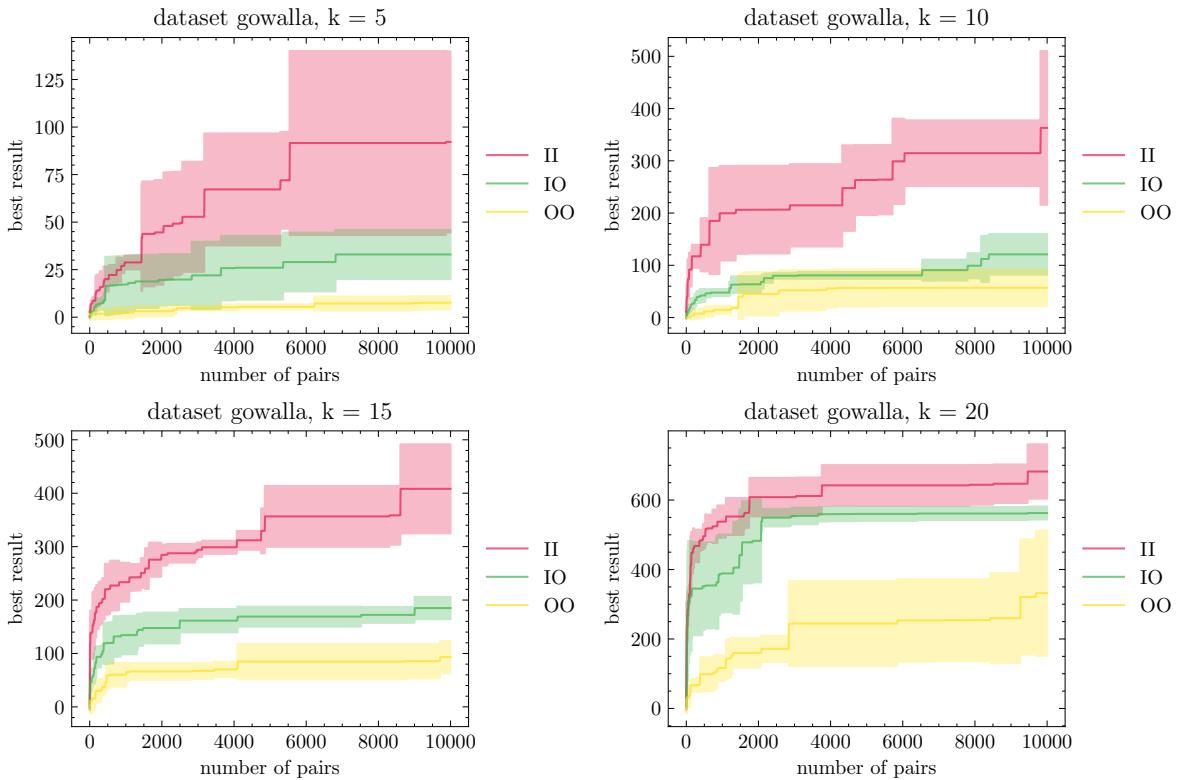


Fig. 10. The full results of the sampling experiments on *gowalla*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

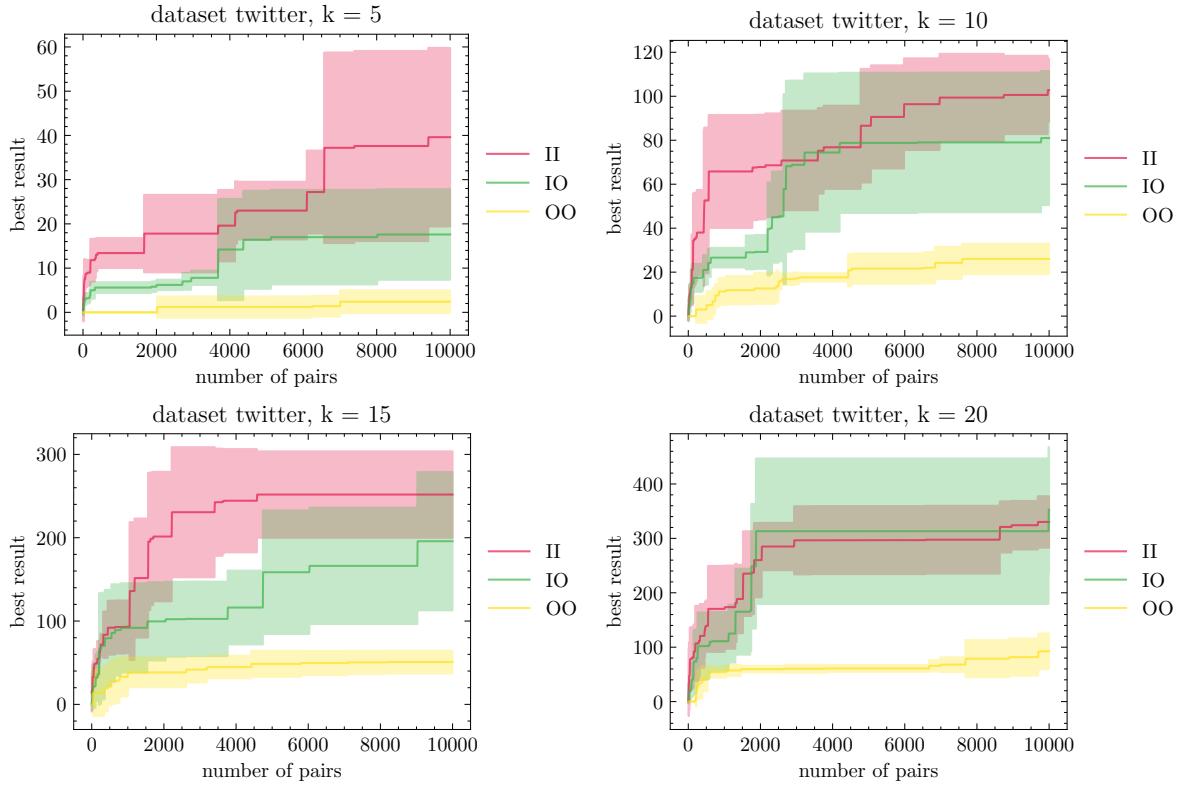


Fig. 11. The full results of the sampling experiments on *twitter*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

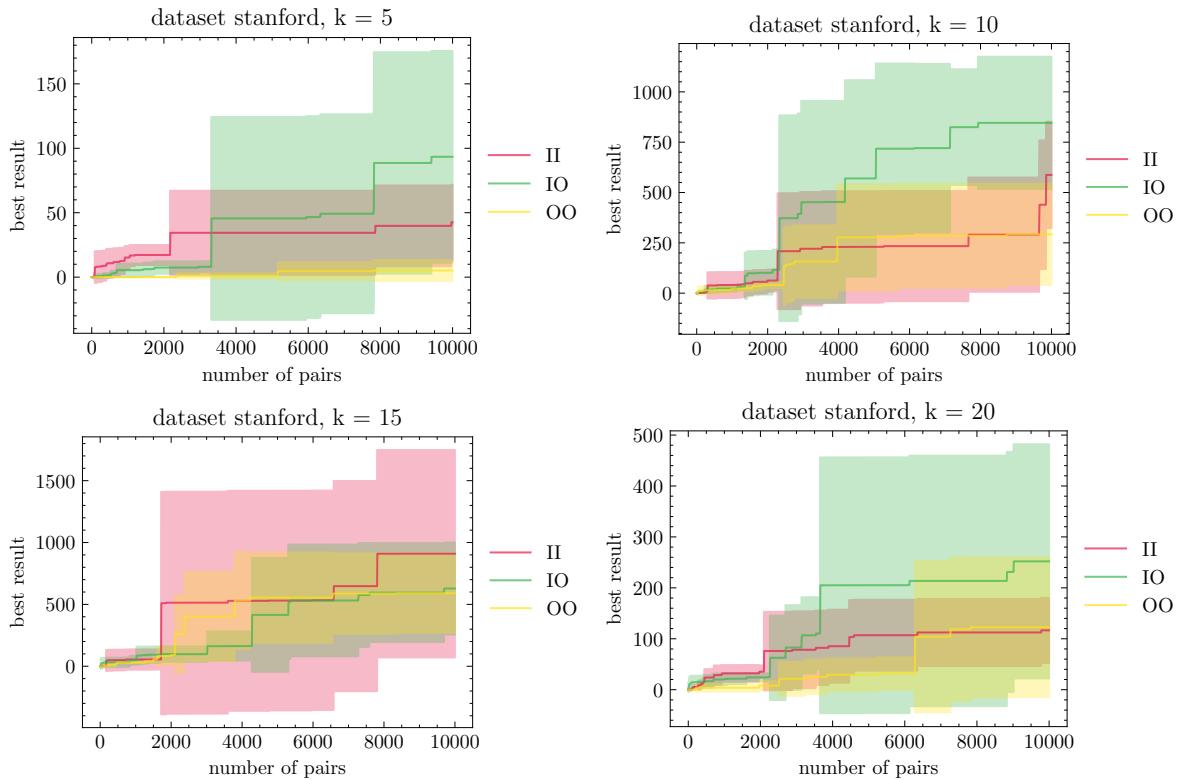


Fig. 12. The full results of the sampling experiments on *stanford*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

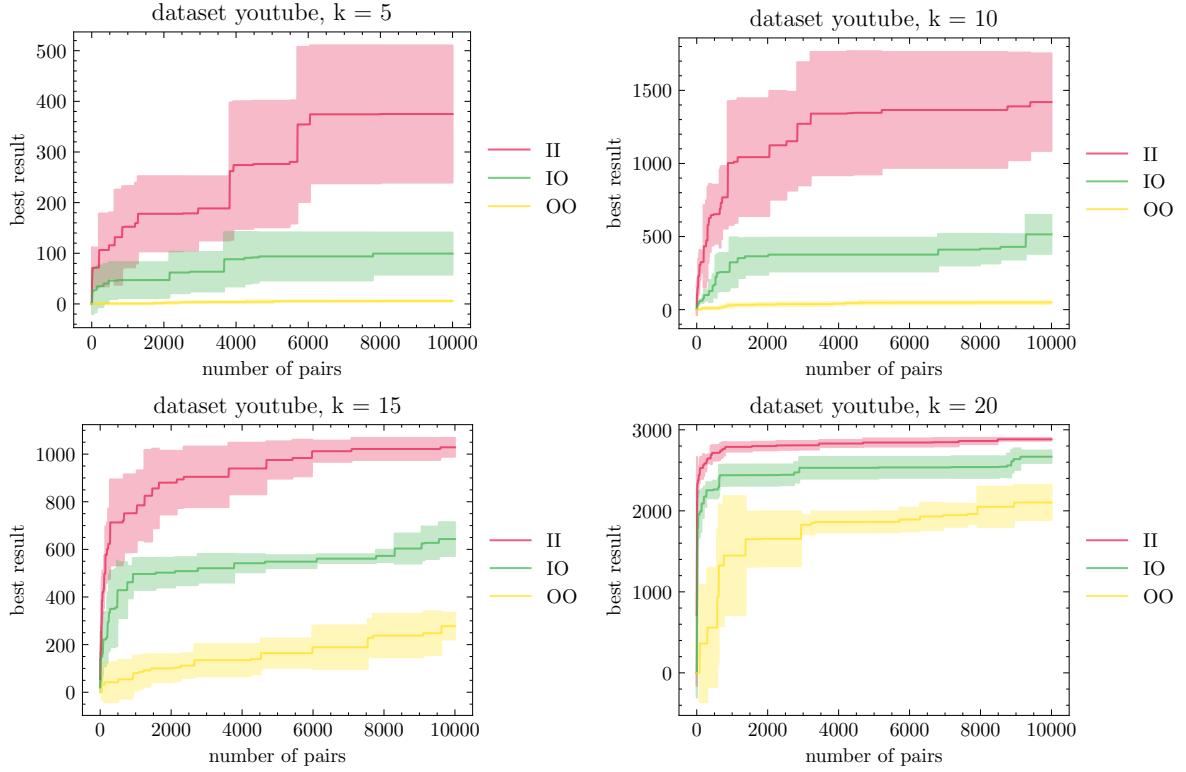


Fig. 13. The full results of the sampling experiments on *youtube*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

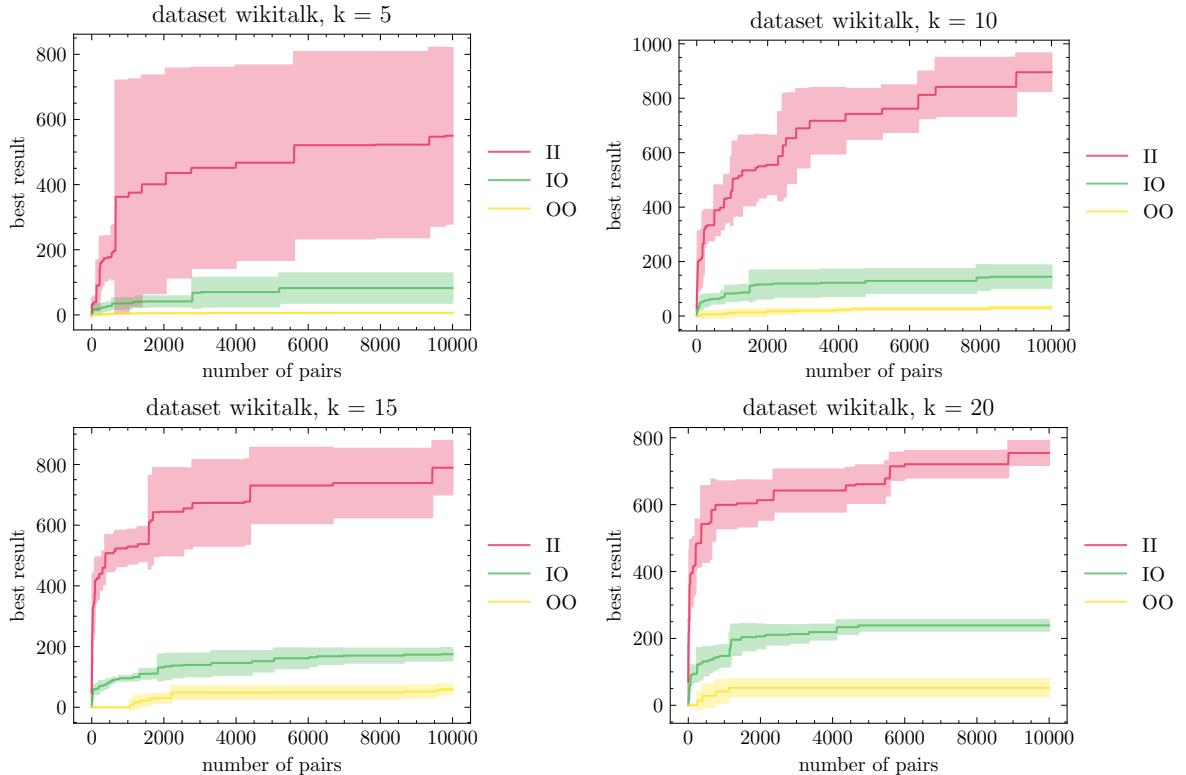


Fig. 14. The full results of the sampling experiments on *wikitalk*. For each considered  $k$  value and each case, we report the best performance among the first  $x$  sampled mergers.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	21	150	331	255
		IN	21	150	331	255
		RD	18.7	97.0	289.3	255.0
	pair-heuristics	SE	21	150	196	255
		NN	21	27	195	0
		RD	7.0	39.3	124.0	133.0
IIMs	node-heuristics	IP	46	192	385	227
		IN	47	200	381	227
		RD	27.7	127.3	320.7	227.0
	pair-heuristics	SE	30	175	255	227
		AE	18	150	291	206
		RD	14.0	78.0	181.7	129.0

Table 15. The full results of the heuristics experiments on *email*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	12	128	142	227
		IN	5	93	54	61
		RD	8.3	100.0	105.0	188.7
	pair-heuristics	SE	12	128	128	165
		NN	0	16	29	151
		RD	3.0	7.0	48.7	85.7
IIMs	node-heuristics	IP	21	100	151	171
		IN	7	17	24	18
		RD	12.3	73.7	92.3	116.7
	pair-heuristics	SE	17	46	151	169
		AE	15	74	50	72
		RD	7.0	22.3	36.0	14.3

Table 16. The full results of the heuristics experiments on *facebook*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	79	100	204	195
		IN	79	100	126	151
		RD	34.0	77.0	181.7	150.7
	pair-heuristics	SE	79	72	204	150
		NN	62	24	76	88
		RD	38.7	34.7	36.3	72.3
IIMs	node-heuristics	IP	452	161	238	181
		IN	452	161	72	37
		RD	54.0	81.7	159.3	113.7
	pair-heuristics	SE	452	161	136	71
		AE	452	161	136	58
		RD	130.3	51.3	36.3	85.0

Table 17. The full results of the heuristics experiments on *brightkite*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	104	145	461	1058
		IN	104	149	456	1058
		RD	13.3	126.0	413.0	971.0
	pair-heuristics	SE	104	122	364	806
		NN	10	82	101	666
		RD	10.7	53.3	162.7	659.7
IIMs	node-heuristics	IP	139	315	445	1224
		IN	97	315	429	1224
		RD	10.3	131.0	348.7	992.0
	pair-heuristics	SE	139	315	330	1115
		AE	57	315	330	1115
		RD	59.0	128.7	215.0	606.3

Table 18. The full results of the heuristics experiments on *enron*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	71	441	409	430
		IN	73	441	409	430
		RD	30.0	272.0	321.3	428.7
	pair-heuristics	SE	71	441	409	430
		NN	19	61	23	0
		RD	10.7	182.0	15.7	198.7
IIMs	node-heuristics	IP	267	531	328	407
		IN	227	556	231	115
		RD	34.0	156.7	219.7	399.3
	pair-heuristics	SE	267	531	312	108
		AE	267	531	328	115
		RD	22.3	108.0	22.3	21.0

Table 19. The full results of the heuristics experiments on *hepph*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	102	550	770	1069
		IN	102	550	770	1205
		RD	45.0	385.3	705.7	1081.3
	pair-heuristics	SE	102	550	770	1054
		NN	49	243	457	445
		RD	39.3	237.3	417.0	487.7
IIMs	node-heuristics	IP	1177	1113	1105	1067
		IN	1177	1113	1129	914
		RD	117.7	543.3	725.7	858.3
	pair-heuristics	SE	1177	1113	1105	958
		AE	1093	1113	1105	841
		RD	333.0	585.7	590.7	778.0

Table 20. The full results of the heuristics experiments on *epinions*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	62	115	246	260
		IN	62	115	246	311
		RD	28.3	82.0	185.3	264.0
	pair-heuristics	SE	59	89	246	186
		NN	20	57	90	165
		RD	33.3	76.0	81.0	113.3
IIMs	node-heuristics	IP	265	259	255	236
		IN	265	248	410	287
		RD	29.0	123.3	228.7	241.7
	pair-heuristics	SE	265	259	244	236
		AE	224	259	196	236
		RD	79.7	68.7	107.3	83.0

Table 21. The full results of the heuristics experiments on *relato*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	621	171	192	154
		IN	621	179	189	154
		RD	329.3	166.0	176.3	142.0
	pair-heuristics	SE	621	150	185	135
		NN	237	89	171	83
		RD	201.0	64.0	81.3	81.7
IIMs	node-heuristics	IP	2737	186	233	136
		IN	2737	177	233	151
		RD	495.7	136.3	173.3	124.7
	pair-heuristics	SE	2737	186	136	124
		AE	2737	153	233	136
		RD	918.3	65.7	120.3	68.7

Table 22. The full results of the heuristics experiments on *slashdot*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	67	259	287	859
		IN	67	259	287	722
		RD	32.7	171.3	212.0	790.3
	pair-heuristics	SE	67	240	249	859
		NN	57	259	249	216
		RD	11.3	65.3	72.7	72.0
IIMs	node-heuristics	IP	525	973	634	809
		IN	525	973	634	414
		RD	60.0	226.0	231.7	400.7
	pair-heuristics	SE	525	973	463	709
		AE	525	973	634	414
		RD	98.3	382.3	129.0	231.7

Table 23. The full results of the heuristics experiments on *syracuse*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	334	496	376	757
		IN	334	496	470	757
		RD	28.0	147.0	297.3	735.0
	pair-heuristics	SE	334	427	376	757
		NN	63	161	270	593
		RD	42.7	133.3	219.7	233.7
IIMs	node-heuristics	IP	2802	853	601	779
		IN	2802	853	601	676
		RD	28.3	144.0	319.3	574.3
	pair-heuristics	SE	2802	810	601	529
		AE	2802	853	437	529
		RD	460.7	399.0	207.0	273.7

Table 24. The full results of the heuristics experiments on *gowalla*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	214	345	443	540
		IN	214	345	520	483
		RD	12.0	84.7	193.0	340.0
	pair-heuristics	SE	214	345	306	327
		NN	147	251	197	167
		RD	18.3	84.0	147.7	113.7
IIMs	node-heuristics	IP	632	955	815	787
		IN	632	955	815	787
		RD	12.0	62.7	146.7	280.3
	pair-heuristics	SE	632	955	815	414
		AE	632	955	815	414
		RD	62.0	332.3	355.3	315.7

Table 25. The full results of the heuristics experiments on *twitter*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	1212	1853	4036	704
		IN	423	1853	4036	676
		RD	680.3	1363.7	2435.3	260.3
	pair-heuristics	SE	1212	1853	4036	704
		NN	0	1165	0	0
		RD	344.3	215.7	462.7	215.7
IIMs	node-heuristics	IP	2407	4879	4054	648
		IN	1454	2868	4054	144
		RD	244.7	896.0	607.7	55.0
	pair-heuristics	SE	2407	4879	4054	59
		AE	1826	2868	4054	14
		RD	317.3	1355.0	40.7	0.0

Table 26. The full results of the heuristics experiments on *stanford*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	854	995	973	2964
		IN	854	995	887	2964
		RD	394.7	669.0	942.7	2929.3
	pair-heuristics	SE	854	995	973	2809
		NN	54	512	724	1902
		RD	185.3	395.7	430.0	2151.3
IIMs	node-heuristics	IP	5363	2145	952	2853
		IN	5363	2145	821	2853
		RD	239.0	688.0	808.7	2771.0
	pair-heuristics	SE	5363	2145	952	2813
		AE	4447	2137	949	2813
		RD	923.7	814.3	458.7	1677.0

Table 27. The full results of the heuristics experiments on *youtube*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.

IOMs/IIMs	nodes/pairs	heuristic	$k = 5$	$k = 10$	$k = 15$	$k = 20$
IOMs	node-heuristics	IP	778	1595	930	344
		IN	778	1595	930	687
		RD	84.0	701.7	553.0	551.7
	pair-heuristics	SE	117	1595	930	317
		NN	73	118	194	287
		RD	207.3	193.0	166.3	221.7
IIMs	node-heuristics	IP	30577	2687	1025	287
		IN	30577	2121	1144	954
		RD	121.0	687.3	555.0	615.3
	pair-heuristics	SE	30577	2687	1025	214
		AE	30577	1570	1025	210
		RD	2892.0	1123.0	204.3	204.7

Table 28. The full results of the heuristics experiments on *wikitalk*. For each algorithm, each considered  $k$  value, we report the performance of each considered node-heuristic and pair-heuristic.