

## SEARCH HISTORY

<b>Application Number</b>	PCT/US.16/44537
<b>Search Conducted By</b>	JOG
<b>Search Approved By</b>	PCL

<b>CPC/IPC Classifications Searched</b>	CPC - G06F 17/30864, G06F 17/30398, G06F 17/30595 IPC(8) - G06F 17/30 (2016.01)
<b>Date Conducted</b>	24 September 2016 (24.09.2016)

<b>Documentation Searched</b>	CPC - G06F 17/30864, G06F 17/30398, G06F 17/30595, G06Q 30/02, G06Q 40/00; USPC - 707/759, 707/765, 707/779 (keyword limited; terms below)
<b>Search Terms Used</b>	query optimization graph manipulation data insert delete stream independent lowest cost dataset recursive
<b>Date Conducted</b>	24 September 2016 (24.09.2016)

<b>Electronic Database Searched</b>	PatBase
<b>Files Searched</b>	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
<b>Date Conducted</b>	24 September 2016 (24.09.2016)

**Search Logic:**

- 1) IC=(G06F17/30) (257486)
- 2) CPC=(G06F17/30864) (8890)
- 3) CPC=(G06F17/30398) (679)
- 4) CPC=(G06F17/30595) (1749)
- 5) 1 or 2 or 3 or 4 (258029)
- 6) CPC=(G06Q30/02) (32982)
- 7) CPC=(G06Q40/00) (8856)
- 8) UC=(707/759) (816)
- 9) UC=(707/765) (605)
- 10) UC=(707/779) (218)
- 11) 10 or 9 or 8 or 7 or 6 or 5 (290450)
- 12) 11 and (quer\*) (81740)

- 13) 12 and (optim\*) (28441)
- 14) 13 and (graph\*) (18713)
- 15) 14 and (manipu\*) (8557)
- 16) 15 and (data) (8550)
- 17) 16 and (insert\*) (4621)
- 18) 17 and (delet\* or remov\*) (4366)
- 19) 18 and (stream\*) (2743)
- 20) 19 and (independ\*) (2376)
- 21) 20 and (lowest near cost\*) (168)
- 22) 21 and (dataset\$) (8)
- 23) (quer\*) and (optim\*) and (graph\* or manipu\* or data or insert\* or delet\* or remov\* or stream\* or independ\* or dataset\$) (372410)
- 24) 23 and (graph\*) (101726)
- 25) 24 and (manipu\*) (36731)
- 26) 25 and (data) (34617)
- 27) 26 and (insert\*) (20823)
- 28) 27 and (delet\* or remov\*) (19780)
- 29) 28 and (stream\*) (9521)
- 30) 29 and (independ\*) (8242)
- 31) 30 and (lowest near cost\*) (479)
- 32) 31 and (dataset\$) (24)

<b>Electronic Database Searched</b>	Google
<b>Files Searched</b>	Google Scholar
<b>Date Conducted</b>	24 September 2016 (24.09.2016)
<b>Search Logic:</b>	
<p>About 2,780,000 results (0.04 sec) for query          About 594,000 results (0.06 sec) for query optimization          About 165,000 results (0.07 sec) for query optimization graph          About 36,900 results (0.10 sec) for query optimization graph manipulation          About 36,500 results (0.14 sec) for query optimization graph manipulation data          About 22,400 results (0.13 sec) for query optimization graph manipulation data insert          About 19,400 results (0.16 sec) for query optimization graph manipulation data insert delete          About 16,200 results (0.16 sec) for query optimization graph manipulation data insert delete stream          About 15,100 results (0.14 sec) for query optimization graph manipulation data insert delete stream independent          About 6,320 results (0.13 sec) for query optimization graph manipulation data insert delete stream independent lowest          About 12,800 results (0.16 sec) for query optimization graph manipulation data insert delete stream independent lowest cost          About 7,200 results (0.18 sec) for query optimization graph manipulation data insert delete stream independent lowest cost dataset          About 3,020 results (0.16 sec) for query optimization graph manipulation data insert delete stream independent lowest cost dataset recursive</p>	

<b>Electronic Database Searched</b>	Google
<b>Files Searched</b>	Google Patents
<b>Date Conducted</b>	24 September 2016 (24.09.2016)

**Search Logic:**

About 186 results (0.86 seconds) for "query optimization" graph manipulation data insert delete stream independent lowest cost dataset recursive

## Supplemental Search:

<b>Electronic Database Searched</b>	PatBase
<b>Files Searched</b>	Full-text: AU BE BR CA CH CN DE DK EP ES FI FR GB IN JP KR SE TH TW US WO Bibliographic: (Europe) AT BA BE BG CH CS CY CZ DD DK EE ES FI GE GR HR HU IE IS IT LT LU LV MC MD MT NL NO PL PT RO RS SE SI SK SM TR UA YU (Asia) EA GC HK ID IL IN KZ MN MY PH RU SG SU TH TJ TW UZ VN (North America) CA CR CU DO GT HN MX NI PA SV TT (South America) AR BR CL CO EC PE UY (Australasia) AU NZ (Africa) AP DZ EG KE MA MW OA ZA ZM ZW
<b>Date Conducted</b>	02 October 2016
<b>Search Logic:</b>	
<p>Search 1: query w4 optimiz* (Results 4635)  Search 2: 1 and execut8 w4 graph (Results 0)  Search 2: 1 and execut* w4 graph (Results 132)  Search 3: 2 and query w4 manipul* (Results 10)  Search 4: 2 and insertion (Results 25)  Search 5: 4 and stream* (Results 18)</p>	

<b>Electronic Database Searched</b>	Google
<b>Files Searched</b>	Web, Scholar with patents
<b>Date Conducted</b>	02 October 2016
<b>Search Logic:</b>	
<p>Scholar;  query optimization using an execution graph About 109,000 results (0.13 sec)  query optimization using an execution graph query manipulation insertion deletion VAbout  17,000 results (0.21 sec)  query optimization using an execution graph query manipulation insertion deletion streaming  About 10,100 results (0.17 sec)</p> <p>Web;  query optimization using an execution graph V</p> <p>query optimization using an execution graph query manipulation insertion deletion About  676,000 results  query optimization using an execution graph query manipulation insertion deletion streaming  About 386,000 results</p>	