

聚合分析场景公开

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开源ontime数据集

ClickHouse表结构DDL

```
1 CREATE TABLE `ontime_local` ON CLUSTER default (  
2   `Year` UInt16,  
3   `Quarter` UInt8,  
4   `Month` UInt8,  
5   `DayofMonth` UInt8,  
6   `DayOfWeek` UInt8,  
7   `FlightDate` Date,  
8   `UniqueCarrier` FixedString(7),  
9   `AirlineID` Int32,  
10  `Carrier` FixedString(2),  
11  `TailNum` String,  
12  `FlightNum` String,  
13  `OriginAirportID` Int32,  
14  `OriginAirportSeqID` Int32,  
15  `OriginCityMarketID` Int32,  
16  `Origin` FixedString(5),  
17  `OriginCityName` String,  
18  `OriginState` FixedString(2),  
19  `OriginStateFips` String,  
20  `OriginStateName` String,  
21  `OriginWac` Int32,  
22  `DestAirportID` Int32,  
23  `DestAirportSeqID` Int32,
```

```
24 `DestCityMarketID` Int32,  
25 `Dest` FixedString(5),  
26 `DestCityName` String,  
27 `DestState` FixedString(2),  
28 `DestStateFips` String,  
29 `DestStateName` String,  
30 `DestWac` Int32,  
31 `CRSDepTime` Int32,  
32 `DepTime` Int32,  
33 `DepDelay` Int32,  
34 `DepDelayMinutes` Int32,  
35 `DepDel15` Int32,  
36 `DepartureDelayGroups` String,  
37 `DepTimeBlk` String,  
38 `TaxiOut` Int32,  
39 `WheelsOff` Int32,  
40 `WheelsOn` Int32,  
41 `TaxiIn` Int32,  
42 `CRSArrTime` Int32,  
43 `ArrTime` Int32,  
44 `ArrDelay` Int32,  
45 `ArrDelayMinutes` Int32,  
46 `ArrDel15` Int32,  
47 `ArrivalDelayGroups` Int32,  
48 `ArrTimeBlk` String,  
49 `Cancelled` UInt8,  
50 `CancellationCode` FixedString(1),  
51 `Diverted` UInt8,  
52 `CRSElapsedTime` Int32,  
53 `ActualElapsedTime` Int32,  
54 `AirTime` Int32,  
55 `Flights` Int32,  
56 `Distance` Int32,  
57 `DistanceGroup` UInt8,  
58 `CarrierDelay` Int32,  
59 `WeatherDelay` Int32,  
60 `NASDelay` Int32,  
61 `SecurityDelay` Int32,  
62 `LateAircraftDelay` Int32,  
63 `FirstDepTime` String,
```

```
64 `TotalAddGTime` String,  
65 `LongestAddGTime` String,  
66 `DivAirportLandings` String,  
67 `DivReachedDest` String,  
68 `DivActualElapsedTime` String,  
69 `DivArrDelay` String,  
70 `DivDistance` String,  
71 `Div1Airport` String,  
72 `Div1AirportID` Int32,  
73 `Div1AirportSeqID` Int32,  
74 `Div1WheelsOn` String,  
75 `Div1TotalGTime` String,  
76 `Div1LongestGTime` String,  
77 `Div1WheelsOff` String,  
78 `Div1TailNum` String,  
79 `Div2Airport` String,  
80 `Div2AirportID` Int32,  
81 `Div2AirportSeqID` Int32,  
82 `Div2WheelsOn` String,  
83 `Div2TotalGTime` String,  
84 `Div2LongestGTime` String,  
85 `Div2WheelsOff` String,  
86 `Div2TailNum` String,  
87 `Div3Airport` String,  
88 `Div3AirportID` Int32,  
89 `Div3AirportSeqID` Int32,  
90 `Div3WheelsOn` String,  
91 `Div3TotalGTime` String,  
92 `Div3LongestGTime` String,  
93 `Div3WheelsOff` String,  
94 `Div3TailNum` String,  
95 `Div4Airport` String,  
96 `Div4AirportID` Int32,  
97 `Div4AirportSeqID` Int32,  
98 `Div4WheelsOn` String,  
99 `Div4TotalGTime` String,  
100 `Div4LongestGTime` String,  
101 `Div4WheelsOff` String,  
102 `Div4TailNum` String,  
103 `Div5Airport` String,
```

```

104 `Div5AirportID` Int32,
105 `Div5AirportSeqID` Int32,
106 `Div5WheelsOn` String,
107 `Div5TotalGTime` String,
108 `Div5LongestGTime` String,
109 `Div5WheelsOff` String,
110 `Div5TailNum` String
111 ) ENGINE = MergeTree
112 PARTITION BY Year
113 ORDER BY (Carrier, FlightDate)
114 SETTINGS index_granularity = 8192;
115
116 CREATE TABLE `ontime` on cluster default as ontime_local
117 ENGINE = Distributed(default, default, ontime, rand());

```

Elasticsearch表结构DDL

```

1 PUT /ontime?pretty
2 {
3   "settings": {
4     "index": {
5       "number_of_shards": 8,
6       "number_of_replicas": 1,
7       "max_result_window": 1000000,
8       "max_inner_result_window": 10000,
9       "requests.cache.enable": false,
10      "queries.cache.enabled": false,
11      "warmer.enabled": false,
12      "sort.field": [
13        "Carrier",
14        "FlightDate"
15      ]
16    }
17  },
18  "mappings": {
19    "properties": {
20      "Year": {
21        "type": "short"

```

```

22     },
23     "Quarter": {
24         "type": "byte"
25     },
26     "Month": {
27         "type": "byte"
28     },
29     "DayofMonth": {
30         "type": "byte"
31     },
32     "DayOfWeek": {
33         "type": "byte"
34     },
35     "FlightDate": {
36         "type": "date",
37         "format": "yyyy-MM-dd HH:mm:ss|yyyy-MM-dd|epoch_milli
s"
38     },
39     "UniqueCarrier": {
40         "type": "keyword"
41     },
42     "AirlineID": {
43         "type": "integer"
44     },
45     "Carrier": {
46         "type": "keyword"
47     },
48     "TailNum": {
49         "type": "keyword"
50     },
51     "FlightNum": {
52         "type": "keyword"
53     },
54     "OriginAirportID": {
55         "type": "integer"
56     },
57     "OriginAirportSeqID": {
58         "type": "integer"
59     },
60     "OriginCityMarketID": {

```

```
61     "type": "integer"
62   },
63   "Origin": {
64     "type": "keyword"
65   },
66   "OriginCityName": {
67     "type": "keyword"
68   },
69   "OriginState": {
70     "type": "keyword"
71   },
72   "OriginStateFips": {
73     "type": "keyword"
74   },
75   "OriginStateName": {
76     "type": "keyword"
77   },
78   "OriginWac": {
79     "type": "integer"
80   },
81   "DestAirportID": {
82     "type": "integer"
83   },
84   "DestAirportSeqID": {
85     "type": "integer"
86   },
87   "DestCityMarketID": {
88     "type": "integer"
89   },
90   "Dest": {
91     "type": "keyword"
92   },
93   "DestCityName": {
94     "type": "keyword"
95   },
96   "DestState": {
97     "type": "keyword"
98   },
99   "DestStateFips": {
100    "type": "keyword"
```

```
101     },
102     "DestStateName": {
103         "type": "keyword"
104     },
105     "DestWac": {
106         "type": "integer"
107     },
108     "CRSDepTime": {
109         "type": "integer"
110     },
111     "DepTime": {
112         "type": "integer"
113     },
114     "DepDelay": {
115         "type": "integer"
116     },
117     "DepDelayMinutes": {
118         "type": "integer"
119     },
120     "DepDel15": {
121         "type": "integer"
122     },
123     "DepartureDelayGroups": {
124         "type": "keyword"
125     },
126     "DepTimeBlk": {
127         "type": "keyword"
128     },
129     "TaxiOut": {
130         "type": "integer"
131     },
132     "WheelsOff": {
133         "type": "integer"
134     },
135     "WheelsOn": {
136         "type": "integer"
137     },
138     "TaxiIn": {
139         "type": "integer"
140     },
```

```
141     "CRSArrTime": {
142         "type": "integer"
143     },
144     "ArrTime": {
145         "type": "integer"
146     },
147     "ArrDelay": {
148         "type": "integer"
149     },
150     "ArrDelayMinutes": {
151         "type": "integer"
152     },
153     "ArrDel15": {
154         "type": "integer"
155     },
156     "ArrivalDelayGroups": {
157         "type": "integer"
158     },
159     "ArrTimeBlk": {
160         "type": "keyword"
161     },
162     "Cancelled": {
163         "type": "byte"
164     },
165     "CancellationCode": {
166         "type": "keyword"
167     },
168     "Diverted": {
169         "type": "byte"
170     },
171     "CRSElapsedTime": {
172         "type": "integer"
173     },
174     "ActualElapsedTime": {
175         "type": "integer"
176     },
177     "AirTime": {
178         "type": "integer"
179     },
180     "Flights": {
```



```
181     "type": "integer"
182   },
183   "Distance": {
184     "type": "integer"
185   },
186   "DistanceGroup": {
187     "type": "byte"
188   },
189   "CarrierDelay": {
190     "type": "integer"
191   },
192   "WeatherDelay": {
193     "type": "integer"
194   },
195   "NASDelay": {
196     "type": "integer"
197   },
198   "SecurityDelay": {
199     "type": "integer"
200   },
201   "LateAircraftDelay": {
202     "type": "integer"
203   },
204   "FirstDepTime": {
205     "type": "keyword"
206   },
207   "TotalAddGTime": {
208     "type": "keyword"
209   },
210   "LongestAddGTime": {
211     "type": "keyword"
212   },
213   "DivAirportLandings": {
214     "type": "keyword"
215   },
216   "DivReachedDest": {
217     "type": "keyword"
218   },
219   "DivActualElapsedTime": {
220     "type": "keyword"
```

```
221     },
222     "DivArrDelay": {
223         "type": "keyword"
224     },
225     "DivDistance": {
226         "type": "keyword"
227     },
228     "Div1Airport": {
229         "type": "keyword"
230     },
231     "Div1AirportID": {
232         "type": "integer"
233     },
234     "Div1AirportSeqID": {
235         "type": "integer"
236     },
237     "Div1WheelsOn": {
238         "type": "keyword"
239     },
240     "Div1TotalGTime": {
241         "type": "keyword"
242     },
243     "Div1LongestGTime": {
244         "type": "keyword"
245     },
246     "Div1WheelsOff": {
247         "type": "keyword"
248     },
249     "Div1TailNum": {
250         "type": "keyword"
251     },
252     "Div2Airport": {
253         "type": "keyword"
254     },
255     "Div2AirportID": {
256         "type": "integer"
257     },
258     "Div2AirportSeqID": {
259         "type": "integer"
260     },
```

```
261     "Div2WheelsOn": {
262         "type": "keyword"
263     },
264     "Div2TotalGTime": {
265         "type": "keyword"
266     },
267     "Div2LongestGTime": {
268         "type": "keyword"
269     },
270     "Div2WheelsOff": {
271         "type": "keyword"
272     },
273     "Div2TailNum": {
274         "type": "keyword"
275     },
276     "Div3Airport": {
277         "type": "keyword"
278     },
279     "Div3AirportID": {
280         "type": "integer"
281     },
282     "Div3AirportSeqID": {
283         "type": "integer"
284     },
285     "Div3WheelsOn": {
286         "type": "keyword"
287     },
288     "Div3TotalGTime": {
289         "type": "keyword"
290     },
291     "Div3LongestGTime": {
292         "type": "keyword"
293     },
294     "Div3WheelsOff": {
295         "type": "keyword"
296     },
297     "Div3TailNum": {
298         "type": "keyword"
299     },
300     "Div4Airport": {
```

```
301     "type": "keyword"
302   },
303   "Div4AirportID": {
304     "type": "integer"
305   },
306   "Div4AirportSeqID": {
307     "type": "integer"
308   },
309   "Div4WheelsOn": {
310     "type": "keyword"
311   },
312   "Div4TotalGTime": {
313     "type": "keyword"
314   },
315   "Div4LongestGTime": {
316     "type": "keyword"
317   },
318   "Div4WheelsOff": {
319     "type": "keyword"
320   },
321   "Div4TailNum": {
322     "type": "keyword"
323   },
324   "Div5Airport": {
325     "type": "keyword"
326   },
327   "Div5AirportID": {
328     "type": "integer"
329   },
330   "Div5AirportSeqID": {
331     "type": "integer"
332   },
333   "Div5WheelsOn": {
334     "type": "keyword"
335   },
336   "Div5TotalGTime": {
337     "type": "keyword"
338   },
339   "Div5LongestGTime": {
340     "type": "keyword"
```

```

341     },
342     "Div5WheelsOff": {
343         "type": "keyword"
344     },
345     "Div5TailNum": {
346         "type": "keyword"
347     }
348 }
349 }
350 }

```

ClickHouse查询语句

```

1  --Q0
2  SELECT avg(c1)
3  FROM
4  (
5      SELECT Year, Month, count(*) AS c1
6      FROM ontime
7      GROUP BY Year, Month
8  );
9  --Q1
10 SELECT DayOfWeek, count(*) AS c
11 FROM ontime
12 WHERE Year>=2000 AND Year<=2008
13 GROUP BY DayOfWeek
14 ORDER BY c DESC;
15 --Q2
16 SELECT DayOfWeek, count(*) AS c
17 FROM ontime
18 WHERE DepDelay>10 AND Year>=2000 AND Year<=2008
19 GROUP BY DayOfWeek
20 ORDER BY c DESC;
21 --Q3
22 SELECT Origin, count(*) AS c
23 FROM ontime
24 WHERE DepDelay>10 AND Year>=2000 AND Year<=2008
25 GROUP BY Origin

```

```

26 ORDER BY c DESC
27 LIMIT 10;
28 --Q4
29 SELECT Carrier, count(*)
30 FROM ontime
31 WHERE DepDelay>10 AND Year=2007
32 GROUP BY Carrier
33 ORDER BY count(*) DESC;
34 --Q5
35 SELECT Carrier, avg(DepDelay>10)*100 AS c3
36 FROM ontime
37 WHERE Year=2007
38 GROUP BY Carrier
39 ORDER BY c3 DESC;
40 --Q6
41 SELECT Carrier, avg(DepDelay>10)*100 AS c3
42 FROM ontime
43 WHERE Year>=2000 AND Year<=2008
44 GROUP BY Carrier
45 ORDER BY c3 DESC;
46 --Q7
47 SELECT Year, avg(DepDelay>10)*100
48 FROM ontime
49 GROUP BY Year
50 ORDER BY Year;
51 --Q8
52 SELECT DestCityName, count(distinct OriginCityName) AS u
53 FROM ontime
54 WHERE Year >= 2000 and Year <= 2010
55 GROUP BY DestCityName
56 ORDER BY u DESC LIMIT 10;
57 --Q9
58 SELECT Year, count(*) AS c1
59 FROM ontime
60 GROUP BY Year;
61 --Q10
62 SELECT
63     min(Year), max(Year), Carrier, count(*) AS cnt,
64     sum(ArrDelayMinutes>30) AS flights_delayed,
65     round(sum(ArrDelayMinutes>30)/count(*),2) AS rate

```

```

66 FROM ontime
67 WHERE
68     DayOfWeek NOT IN (6,7) AND OriginState NOT IN ('AK', 'HI', 'P
R', 'VI')
69     AND DestState NOT IN ('AK', 'HI', 'PR', 'VI')
70     AND FlightDate < '2010-01-01'
71 GROUP by Carrier
72 HAVING cnt>100000 and max(Year)>1990
73 ORDER by rate DESC
74 LIMIT 1000;
75 --Q11
76 SELECT avg(cnt)
77 FROM
78 (
79     SELECT Year,Month,count(*) AS cnt
80     FROM ontime
81     WHERE DepDel15=1
82     GROUP BY Year,Month
83 );
84 --Q12
85 SELECT avg(c1) FROM
86 (
87     SELECT Year,Month,count(*) AS c1
88     FROM ontime
89     GROUP BY Year,Month
90 );
91 --Q13
92 SELECT DestCityName, uniqExact(OriginCityName) AS u
93 FROM ontime
94 GROUP BY DestCityName
95 ORDER BY u DESC
96 LIMIT 10;
97 --Q14
98 SELECT OriginCityName, DestCityName, count() AS c
99 FROM ontime
100 GROUP BY OriginCityName, DestCityName
101 ORDER BY c DESC
102 LIMIT 10;
103 --Q15
104 SELECT OriginCityName, count() AS c

```

```
105 FROM ontime
106 GROUP BY OriginCityName
107 ORDER BY c DESC
108 LIMIT 10;
```

Elasticsearch查询语句

```
1 --Q0
2 GET /ontime/_search?pretty
3 {
4   "size": 0,
5   "query": {
6     "constant_score": {
7       "filter": {
8         "match_all": {
9           "boost": 1
10        }
11      },
12     "boost": 1
13   }
14 },
15 "_source": false,
16 "aggregations": {
17   "by_year_month": {
18     "terms": {
19       "script": {
20         "source": "(doc['Year'].size() > 0 ? doc['Year'].value
21         * 100 : 0) + (doc['Month'].size() > 0 ? doc['Month'].value : 0)"
22       },
23       "lang": "painless"
24     }
25   },
26   "avg_monthly": {
27     "avg_bucket": {
28       "buckets_path": "by_year_month._count"
29     }
30   }
31 }
```



```

30  }
31 }
32
33 --Q1
34 POST /_sql?format=txt&pretty
35 {
36   "query": "SELECT DayOfWeek, count(*) AS c FROM ontime WHERE Ye
           ar>=2000 AND Year<=2008 GROUP BY DayOfWeek ORDER BY c DESC"
37 }
38
39 --Q2
40 POST /_sql?format=txt&pretty
41 {
42   "query": "SELECT DayOfWeek, count(*) AS c FROM ontime WHERE De
           pDelay>10 AND Year>=2000 AND Year<=2008 GROUP BY DayOfWeek ORDER
           BY c DESC"
43 }
44
45 --Q3
46 POST /_sql?format=txt&pretty
47 {
48   "query": "SELECT Origin, count(*) AS c FROM ontime WHERE DepDe
           lay>10 AND Year>=2000 AND Year<=2008 GROUP BY Origin ORDER BY c
           DESC LIMIT 10"
49 }
50
51 --Q4
52 POST /_sql?format=txt&pretty
53 {
54   "query": "SELECT Carrier, count(*) FROM ontime WHERE DepDelay>
           10 AND Year=2007 GROUP BY Carrier ORDER BY count(*) DESC"
55 }
56
57 --Q5
58 GET /ontime/_search?pretty
59 {
60   "size" : 0,
61   "query" : {
62     "constant_score" : {
63       "filter" : {

```

```

64     "term" : {
65         "Year" : {
66             "value" : 2007,
67             "boost" : 1.0
68         }
69     }
70 },
71     "boost" : 1.0
72 }
73 },
74 "_source" : false,
75 "aggregations" : {
76     "by_carrier" : {
77         "terms" : {
78             "field" : "Carrier",
79             "order" : [
80                 {
81                     "c3" : "asc"
82                 },
83                 {
84                     "_key" : "asc"
85                 }
86             ]
87         },
88         "aggregations" : {
89             "c3" : {
90                 "avg" : {
91                     "script" : {
92                         "source" : "doc['DepDelay'].value > 10 ? 100.0 :
0.0",
93                         "lang" : "painless"
94                     }
95                 }
96             }
97         }
98     }
99 }
100 }
101
102 --Q6

```

```
103 GET /ontime/_search?pretty
104 {
105   "size" : 0,
106   "query" : {
107     "constant_score" : {
108       "filter" : {
109         "range" : {
110           "Year" : {
111             "from" : 2000,
112             "to" : 2008,
113             "include_lower" : true,
114             "include_upper" : true,
115             "boost" : 1.0
116           }
117         }
118       },
119       "boost" : 1.0
120     }
121   },
122   "_source" : false,
123   "aggregations" : {
124     "by_carrier" : {
125       "terms" : {
126         "field" : "Carrier",
127         "order" : [
128           {
129             "c3" : "asc"
130           },
131           {
132             "_key" : "asc"
133           }
134         ]
135       },
136       "aggregations" : {
137         "c3" : {
138           "avg" : {
139             "script" : {
140               "source" : "doc['DepDelay'].value > 10 ? 100.0 :
141               0.0",
142             "lang" : "painless"
```

```

142     }
143     }
144     }
145     }
146     }
147     }
148 }
149
150 --Q7
151 GET /ontime/_search?pretty
152 {
153   "size" : 0,
154   "_source" : false,
155   "stored_fields" : "_none_",
156   "aggregations" : {
157     "groupby" : {
158       "terms" : {
159         "field" : "Year",
160         "order" : [
161           {
162             "_key" : "asc"
163           }
164         ]
165       },
166       "aggregations" : {
167         "45915a29" : {
168           "avg" : {
169             "script" : {
170               "source" : "doc['DepDelay'].value > 10 ? 100.0 :
0.0",
171               "lang" : "painless"
172             }
173           }
174         }
175       }
176     }
177   }
178 }
179
180 --Q8

```

```

181 POST /_sql?format=txt&pretty
182 {
183   "query": "SELECT DestCityName, count(distinct OriginCityName)
            AS u FROM ontime WHERE Year >= 2000 and Year <= 2010 GROUP BY D
            estCityName ORDER BY u DESC LIMIT 10"
184 }
185
186 --Q9
187 POST /_sql?format=txt&pretty
188 {
189   "query": "SELECT Year, count(*) AS c1 FROM ontime GROUP BY Yea
            r"
190 }
191
192 --Q10
193 GET /ontime/_search?pretty
194 {
195   "size": 0,
196   "query": {
197     "constant_score": {
198       "filter": {
199         "bool": {
200           "must": [
201             {
202               "range": {
203                 "FlightDate": {
204                   "from": null,
205                   "to": "2010-01-01",
206                   "include_lower": true,
207                   "include_upper": false,
208                   "boost": 1
209                 }
210             }
211           ],
212           "must_not": [
213             {
214               "term": {
215                 "DestState": {
216                   "value": "AK",

```

```
218         "boost": 1
219     }
220 }
221 },
222 {
223     "term": {
224         "DestState": {
225             "value": "HI",
226             "boost": 1
227         }
228     }
229 },
230 {
231     "term": {
232         "DestState": {
233             "value": "PR",
234             "boost": 1
235         }
236     }
237 },
238 {
239     "term": {
240         "DestState": {
241             "value": "VI",
242             "boost": 1
243         }
244     }
245 },
246 {
247     "term": {
248         "DayOfWeek": {
249             "value": 6,
250             "boost": 1
251         }
252     }
253 },
254 {
255     "term": {
256         "DayOfWeek": {
257             "value": 7,
```

```

258         "boost": 1
259     }
260 }
261 },
262 {
263     "term": {
264         "OriginState": {
265             "value": "AK",
266             "boost": 1
267         }
268     }
269 },
270 {
271     "term": {
272         "OriginState": {
273             "value": "HI",
274             "boost": 1
275         }
276     }
277 },
278 {
279     "term": {
280         "OriginState": {
281             "value": "PR",
282             "boost": 1
283         }
284     }
285 },
286 {
287     "term": {
288         "OriginState": {
289             "value": "VI",
290             "boost": 1
291         }
292     }
293 }
294 ],
295 "adjust_pure_negative": true,
296 "boost": 1
297 }

```

```

298     },
299     "boost": 1
300   }
301 },
302 "_source": false,
303 "aggregations": {
304   "by_carrier": {
305     "terms": {
306       "field": "Carrier",
307       "order": [
308         {
309           "_count": "desc"
310         },
311         {
312           "_key": "asc"
313         }
314       ]
315     },
316     "aggregations": {
317       "minYear": {
318         "min": {
319           "field": "Year"
320         }
321       },
322       "maxYear": {
323         "max": {
324           "field": "Year"
325         }
326       },
327       "flights_delayed": {
328         "sum": {
329           "script": {
330             "source": "doc['ArrDelayMinutes'].value > 30 ? 1 :
0",
331           "lang": "painless"
332         }
333       }
334     },
335     "rate": {
336       "bucket_script": {

```



```

337     "buckets_path": {
338         "_value0": "flights_delayed",
339         "_value1": "_count"
340     },
341     "script": {
342         "source": "1.0 * params._value0 / params._value1",
343         "lang": "painless"
344     }
345 }
346 },
347 "having_cnt": {
348     "bucket_selector": {
349         "buckets_path": {
350             "_value0": "_count"
351         },
352         "script": {
353             "source": "params._value0 > 100000",
354             "lang": "painless"
355         }
356     }
357 },
358 "having_year": {
359     "bucket_selector": {
360         "buckets_path": {
361             "_value0": "maxYear"
362         },
363         "script": {
364             "source": "params._value0 > 1990",
365             "lang": "painless"
366         }
367     }
368 },
369 "order_by_rate": {
370     "bucket_sort": {
371         "sort": [
372             {
373                 "rate": {
374                     "order": "desc"
375                 }
376             }

```

```

377         ],
378         "from": 0,
379         "size": 1000
380     }
381 }
382 }
383 }
384 }
385 }
386
387 --Q11
388 GET /ontime/_search?pretty
389 {
390     "size": 0,
391     "query": {
392         "constant_score": {
393             "filter" : {
394                 "term" : {
395                     "DepDel15" : {
396                         "value" : 1,
397                         "boost" : 1.0
398                     }
399                 }
400             },
401             "boost": 1
402         }
403     },
404     "_source": false,
405     "aggregations": {
406         "by_year_month": {
407             "terms": {
408                 "script": {
409                     "source": "doc['Year'].value * 100 + doc['Month'].valu
410 e",
411                 "lang": "painless"
412             }
413         },
414         "avg_monthly": {
415             "avg_bucket": {

```

```

416     "buckets_path": "by_year_month._count"
417   }
418 }
419 }
420 }
421
422 --Q12
423 GET /ontime/_search?pretty
424 {
425   "size": 0,
426   "query": {
427     "constant_score": {
428       "filter": {
429         "match_all": {
430           "boost": 1
431         }
432       },
433       "boost": 1
434     }
435   },
436   "_source": false,
437   "aggregations": {
438     "by_year_month": {
439       "terms": {
440         "script": {
441           "source": "(doc['Year'].size() > 0 ? doc['Year'].value
* 100 : 0) + (doc['Month'].size() > 0 ? doc['Month'].value : 0)"
442         ,
443           "lang": "painless"
444         }
445       },
446       "avg_monthly": {
447         "avg_bucket": {
448           "buckets_path": "by_year_month._count"
449         }
450       }
451     }
452 }
453

```

```
454 --Q13
455 POST /_sql?format=txt&pretty
456 {
457   "query": "SELECT DestCityName, count(distinct OriginCityName)
            AS u FROM ontime GROUP BY DestCityName ORDER BY u DESC LIMIT 1
            0"
458 }
459
460 --Q14
461 POST /_sql?format=txt&pretty
462 {
463   "query": "SELECT OriginCityName, DestCityName, count(*) AS c F
            ROM ontime GROUP BY OriginCityName, DestCityName ORDER BY c DESC
            LIMIT 10"
464 }
465
466 --Q15
467 POST /_sql?format=txt&pretty
468 {
469   "query": "SELECT OriginCityName, count(*) AS c FROM ontime GRO
            UP BY OriginCityName ORDER BY c DESC LIMIT 10"
470 }
```