

18CSC403 Practical Techniques for Big Data Processing

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HIVE QUERIES

1. Find The Blocks and Districts where the most and least crimes were reported in the year 2017

- SELECT block, district, COUNT(*) AS cntdistrict FROM crimes WHERE year == 2017 GROUP BY block,district ORDER BY cntdistrict DESC limit 5;

```
001XX N STATE ST          1.0      39
0000X W TERMINAL ST       16.0      21
008XX N MICHIGAN AVE      18.0      19
038XX W ROOSEVELT RD      10.0      17
0000X S STATE ST          1.0      16
Time taken: 7.485 seconds, Fetched: 5 row(s)
```

- SELECT block, district, COUNT(*) AS cntdistrict FROM crimes WHERE year == 2017 GROUP BY block,district ORDER BY cntdistrict limit 5;

```
0000X E 118TH ST          5.0        1
0000X E 110TH ST          5.0        1
0000X E 103RD ST          5.0        1
136XX S INDIANA AVE       5.0        1
0000X E 100TH PL          5.0        1
Time taken: 7.758 seconds, Fetched: 5 row(s)
```

2. Most crime prone locations in Chicago with crime counts more than > 5000 in 2012-17 time period.

- SELECT locationdescription, count(locationdescription) AS cnt FROM crimes GROUP BY locationdescription HAVING cnt > 5000;

```

Total MapReduce CPU Time Spent: 0 msec
OK
ALLEY 31716
COMMERCIAL / BUSINESS OFFICE 7599
CTA PLATFORM 7244
DEPARTMENT STORE 20705
DRUG STORE 5352
GAS STATION 15375
PARK PROPERTY 12262
RESIDENCE PORCH/HALLWAY 25509
RESTAURANT 25869
SMALL RETAIL STORE 28782
STREET 328326
"SCHOOL 36439
APARTMENT 185014
BANK 5338
BAR OR TAVERN 9870
CONVENIENCE STORE 6725
CTA BUS 6157
CTA TRAIN 7134
GROCERY FOOD STORE 15995
HOTEL/MOTEL 6394
OTHER 55369
PARKING LOT/GARAGE(NON.RESID.) 41245
RESIDENCE 233477
RESIDENCE-GARAGE 25642
RESIDENTIAL YARD (FRONT/BACK) 30441
SIDEWALK 160856
VACANT LOT/LAND 6644
VEHICLE NON-COMMERCIAL 25069
Time taken: 6.496 seconds, Fetched: 28 row(s)

```

3. Year wise crime data:

- CREATE TABLE yearwisecrime AS SELECT year, primarytype, count(*) AS CrimeCount FROM crimes GROUP BY year,primarytype ORDER BY year, primarytype;
- SELECT * FROM yearwisecrime;

```

2012    NON-CRIMINAL      6
2012    NON-CRIMINAL (SUBJECT SPECIFIED)      2
2012    OBSCENITY        23
2012    OFFENSE INVOLVING CHILDREN      2126
2012    OTHER NARCOTIC VIOLATION        6
2012    OTHER OFFENSE    17285
2012    PROSTITUTION     2203
2012    PUBLIC INDECENCY      16
2012    PUBLIC PEACE VIOLATION  2689
2012    ROBBERY 13422
2012    SEX OFFENSE        992
2012    STALKING           202
2012    THEFT 73423
2012    WEAPONS VIOLATION      3734
2013    ARSON 358
2013    ASSAULT 16640
2013    BATTERY 51286
2013    BURGLARY 17734
2013    CRIM SEXUAL ASSAULT  1243
2013    CRIMINAL DAMAGE 30453
2013    CRIMINAL TRESPASS  7866

```

4. Violent crimes involving gun

- create table guncrimes as

select year, count (casenumber) as TotalCrimes,

SUM (if ((DESCRIPTION LIKE '%FIREARM%' OR

DESCRIPTION LIKE '%GUN%'), 1 , 0)) AS TotalWithGuns,

SUM (if (

(primarytype = 'ASSAULT' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

OR

(primarytype = 'CRIME SEXUAL ASSAULT' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

OR

(primarytype = 'OFFENSE INVOLVING CHILDREN' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

OR

(primarytype = 'OTHER OFFENSE' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

OR

(primarytype = 'RITUALISM' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

OR

(primarytype = 'ROBBERY' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

OR

(primarytype = 'WEAPONS VIOLATION' AND (DESCRIPTION LIKE '%FIREARM%' OR DESCRIPTION LIKE '%GUN%') AND (NOT DESCRIPTION LIKE '%SALE%' OR NOT DESCRIPTION LIKE '%POS%'))

, 1 , 0)) AS TotalViolentWithGuns

from crimes

group by year order by year desc ;

- select * from guncrimes;

Year	1	0	0
6.0	1	0	0
52.0	1	0	0
2017	11190	725	626
2016	259029	14576	11787
2015	256319	11377	9412
2014	266658	10302	8625
2013	296923	10474	9002
2012	325846	12938	10953
1946646.0	1	0	0

5. Domestic Crimes by Geo Location:

- SELECT block,district, latitude, longitude, count(*) from crimes WHERE domestic = True
GROUP BY block,district, latitude,longitude;

019XX S CANALPORT AVE	12.0	NULL	NULL	2
019XX S CANALPORT AVE	12.0	42	-88	5
019XX S CHRISTIANA AVE	10.0	42	-88	25
019XX S DEARBORN ST	1.0	42	-88	1
019XX S FAIRFIELD AVE	10.0	42	-88	2
019XX S HALSTED ST	12.0	42	-88	3
019XX S INDIANA AVE	1.0	NULL	NULL	1
019XX S INDIANA AVE	1.0	42	-88	2
019XX S KEDZIE AVE	10.0	42	-88	19
019XX S KOSTNER AVE	10.0	42	-88	2
019XX S LAWDALE AVE	10.0	42	-88	8
019XX S LEAVITT ST	12.0	42	-88	6
019XX S LOOMIS ST	12.0	42	-88	6
019XX S MAY ST	12.0	42	-88	11
019XX S MICHIGAN AVE	1.0	42	-88	2
019XX S MILLER ST	12.0	42	-88	4
019XX S PRAIRIE AVE	1.0	42	-88	2
019XX S RACINE AVE	12.0	42	-88	10
019XX S RIDGEWAY AVE	10.0	42	-88	10
019XX S SHELBY CT	12.0	42	-88	1
019XX S STATE ST	1.0	42	-88	6
019XX S WABASH AVE	1.0	42	-88	14
019XX S WELLS ST	9.0	42	-88	3
019XX S WESTERN AVE	10.0	42	-88	2

PIG QUERIES

6. The most frequently occurring primary type (i.e. theft, narcotics etc..)

- `grunt> crime = load '/home/hadoopusr/Downloads/Chicago_Crimes_2012_to_2017.csv' using PigStorage(',') as (num : int, id : chararray, casenumber : chararray, date : datetime, block : chararray, iucr : chararray, primarytype : chararray, description : chararray, locationdescription : chararray, arrest : boolean, domestic : boolean, beat : int, district : chararray, ward : chararray, communityarea : chararray, fbicode : chararray, xcoordinate : chararray, ycoordinate : chararray, year : chararray, updatedon : datetime, latitude : float, longitude : float, location : chararray);`
- `grunt> crime1 = GROUP crime BY primarytype;`
- `grunt> crime2 = FOREACH crime1 GENERATE group as primarytype,COUNT(crime.id) AS cnt;`
- `grunt> srtd = ORDER crime2 BY cnt DESC;`
- `grunt> dump srtd;`

```
(THEFT,329460)
(BATTERY,263700)
(CRIMINAL DAMAGE,155455)
(NARCOTICS,135240)
(ASSAULT,91289)
(OTHER OFFENSE,87874)
(BURGLARY,83397)
(DECEPTIVE PRACTICE,75495)
(MOTOR VEHICLE THEFT,61138)
(ROBBERY,57313)
(CRIMINAL TRESPASS,36912)
(WEAPONS VIOLATION,17233)
(PUBLIC PEACE VIOLATION,13122)
(OFFENSE INVOLVING CHILDREN,11398)
(PROSTITUTION,7633)
(CRIM SEXUAL ASSAULT,6823)
(INTERFERENCE WITH PUBLIC OFFICER,6195)
(SEX OFFENSE,4885)
(HOMICIDE,2649)
(ARSON,2217)
(GAMBLING,2212)
(LIQUOR LAW VIOLATION,1953)
(KIDNAPPING,1099)
(STALKING,828)
(INTIMIDATION,662)
(OBSCENITY,187)
(NON-CRIMINAL,93)
(CONCEALED CARRY LICENSE VIOLATION,90)
(PUBLIC INDECENCY,62)
(NON - CRIMINAL,38)
(OTHER NARCOTIC VIOLATION,30)
(HUMAN TRAFFICKING,28)
(NON-CRIMINAL (SUBJECT SPECIFIED),4)
(Primary Type,1)
```

7. BLOCKS with the most reported incidents

- grunt> crime_grp_block= GROUP crime BY block;
- grunt> crime_grp_block_cntd = FOREACH crime_grp_block GENERATE group as block, COUNT(crime.id) AS cnt;
- grunt> srtd = ORDER crime_grp_block_cntd BY cnt DESC;
- grunt> dump srtd;

```
(052XX S MENARD AVE,11)
(028XX N LAVERGNE AVE,11)
(023XX W 81ST ST,11)
(038XX W 46TH PL,11)
(056XX S MASON AVE,11)
(014XX W SUNNYSIDE AVE,11)
(029XX N LAKEWOOD AVE,11)
(089XX S STATE ST,11)
(056XX S NAGLE AVE,11)
(029XX S BONAPARTE ST,11)
(056XX W PALMER ST,11)
(056XX W TAYLOR ST,11)
(030XX N OLEANDER AVE,11)
(042XX W 81ST ST,11)
(049XX N MONTCLARE AVE,11)
(017XX W 95TH PL,11)
(036XX W 68TH PL,11)
(048XX N NASHVILLE AVE,11)
(070XX W NORTH AVE,11)
(020XX W GRACE ST,11)
(048XX N MONTCLARE AVE,11)
(050XX S DR MARTIN LUTHER KING JR SD,11)
(001XX N 56TH AVE,11)
```

8. Arrests by district

- grunt> crime = load '/home/hadoopusr/Downloads/Chicago_Crimes_2012_to_2017.csv' using PigStorage(',') as (num : int, id : chararray, casenumber : chararray, date : datetime, block : chararray, iucr : chararray, primarytype : chararray, description : chararray, locationdescription : chararray, arrest : boolean, domestic : boolean, beat : int, district : chararray, ward : chararray, communityarea : chararray, fbicode : chararray, xcoordinate : chararray, ycoordinate : chararray, year : chararray, updatedon : datetime, latitude : float, longitude : float, location : chararray);
- grunt> crime_filter = FILTER crime BY arrest==TRUE;
- grunt> crime_grp_dist = GROUP crime_filter BY district;

- `grunt> crime_grp_dist_cntd = FOREACH crime_grp_dist GENERATE group as district, COUNT(crime_filter.id) AS cnt;`
- `grunt> srtd = ORDER crime_grp_dist_cntd BY cnt DESC;`
- `grunt> dump srtd;`

```
(11.0,44580)
(7.0,25406)
(15.0,24043)
(6.0,23138)
(25.0,22310)
(8.0,21653)
(10.0,19889)
(4.0,19643)
(9.0,18116)
(3.0,18052)
(5.0,17229)
(1.0,14970)
(18.0,12637)
(19.0,12370)
(12.0,12344)
(2.0,12253)
(22.0,9668)
(16.0,8868)
(24.0,8753)
(14.0,8731)
(17.0,6730)
(20.0,4913)
(31.0,21)
(,1)
```

9. Thefts That Happened in Apartments

- `B = FILTER crime BY primarytype == 'THEFT' AND locationdescription == 'APARTMENT';`

```
(3333669,10022947,HY212679,,074XX S LUELLA AVE,0890,THEFT,FROM BUILDING,APARTMENT,false,false,333,3.0,7.0,43.0,06,1192504.0,1856003.0,2015,,41.759846,-87.57003,"(41.759846847)
(3333710,10022997,HY212531,,035XX S RHODES AVE,0810,THEFT,OVER $500,APARTMENT,false,false,212,2.0,4.0,35.0,06,1180172.0,1881335.0,2015,,41.82965,-87.61445,"(41.829651528)
(3333721,10023011,HY212769,,045XX N MAGNOLIA AVE,0810,THEFT,OVER $500,APARTMENT,false,false,1913,19.0,46.0,3.0,06,1167101.0,1930317.0,2015,,41.96435,-87.661,"(41.964351639)
(3333736,10023026,HY212677,,033XX S MORGAN ST,0810,THEFT,OVER $500,APARTMENT,false,false,913,9.0,11.0,60.0,06,1170183.0,1882979.0,2015,,41.834385,-87.651054,"(41.834386348)
(3333788,10023086,HY212817,,052XX S BLACKSTONE AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,false,234,2.0,4.0,41.0,06,1186800.0,1870814.0,2015,,41.800625,-87.59047,"(41.80062644)
(3333795,10023095,HY212777,,063XX S WOOD ST,0820,THEFT,$500 AND UNDER,APARTMENT,false,true,725,7.0,15.0,67.0,06,1165427.0,1862674.0,2015,,41.77877,-87.66908,"(41.7787769405)
(3333908,10023234,HY212954,,001XX E KENSINGTON AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,false,532,5.0,9.0,53.0,06,1179350.0,1828232.0,2015,,41.68395,-87.61909,"(41.683949848)
(3333959,10023297,HY213037,,075XX S ST LAWRENCE AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,true,624,6.0,6.0,69.0,06,1181539.0,1855193.0,2015,,41.757885,-87.610245,"(41.757884079)
(3333986,10023365,HY213101,,068XX S UNION AVE,0810,THEFT,OVER $500,APARTMENT,true,false,723,7.0,6.0,68.0,06,1172916.0,1859614.0,2015,,41.77021,-87.641716,"(41.770210385)
(3334026,10023572,HY213220,,092XX S KIMBARK AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,false,413,4.0,8.0,47.0,06,1186487.0,1843798.0,2015,,41.726498,-87.59247,"(41.72649948)
(3334194,10023926,HY213528,,069XX S TALMAN AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,false,831,8.0,18.0,66.0,06,1159907.0,1858526.0,2015,,41.7675,-87.68943,"(41.767501925)
(3334245,10023991,HY213591,,078XX S CHAMPLAIN AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,false,624,6.0,6.0,69.0,06,1181922.0,1853185.0,2015,,41.752365,-87.6089,"(41.752365072)
(3334281,10024064,HY213746,,070XX S RACINE AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,true,734,7.0,17.0,67.0,06,1169535.0,1858171.0,2015,,41.766323,-87.65415,"(41.76632455)
(3334465,10024259,HY213989,,036XX N LAKE SHORE DR,0890,THEFT,FROM BUILDING,APARTMENT,false,false,1925,19.0,46.0,6.0,06,1171841.0,1924794.0,2015,,41.949093,-87.64374,"(41.949092979)
(3334578,10024392,HY213548,,016XX W 81ST ST,0810,THEFT,OVER $500,APARTMENT,false,false,614,6.0,21.0,71.0,06,1166905.0,1851001.0,2015,,41.746704,-87.663994,"(41.746705668)
(3334630,10024628,HY214233,,016XX N WHIPPLE ST,0890,THEFT,FROM BUILDING,APARTMENT,false,false,1421,14.0,26.0,23.0,06,1155715.0,1910708.0,2015,,41.91078,-87.70339,"(41.910780664)
(3334679,10024769,HY214344,,064XX N WAYNE AVE,0890,THEFT,FROM BUILDING,APARTMENT,false,false,2432,24.0,40.0,1.0,06,1166102.0,1942879.0,2015,,41.998844,-87.664314,"(41.998843593)
(3334684,10024781,HY214211,,004XX N LA SALLE DR,0890,THEFT,FROM BUILDING,APARTMENT,false,false,1831,18.0,42.0,8.0,06,1175066.0,1903064.0,2015,,41.889393,-87.63254,"(41.889393149)
(3334930,10025277,HY214643,,054XX S DORCHESTER AVE,0890,THEFT,FROM BUILDING,APARTMENT,false,false,234,2.0,4.0,41.0,06,1186465.0,1869624.0,2015,,41.797367,-87.591736,"(41.797368929)
(3334979,10025347,HY214883,,010XX N RIDGEWAY AVE,0820,THEFT,$500 AND UNDER,APARTMENT,false,false,1112,11.0,27.0,23.0,06,1151193.0,1906643.0,2015,,41.899715,-87.720116,"(41.899715846)
```


MAPREDUCE

10. MapReduce program to count the different types of crimes that occurred in Chicago City from 2012 to 2017

```
import java.io.IOException;

import java.util.*;

import org.apache.hadoop.fs.Path;

import org.apache.hadoop.conf.*;

import org.apache.hadoop.io.*;

import org.apache.hadoop.mapreduce.*;

import org.apache.hadoop.mapreduce.lib.input.FileInputFormat;

import org.apache.hadoop.mapreduce.lib.input.TextInputFormat;

import org.apache.hadoop.mapreduce.lib.output.FileOutputFormat;

import org.apache.hadoop.mapreduce.lib.output.TextOutputFormat;

public class FBI_crimecount{

    public static class Map extends Mapper<LongWritable, Text, Text,
    IntWritable> {

        private final static IntWritable one = new IntWritable(1);

        private Text word = new Text();

        public void map(LongWritable key, Text value, Context context)
        throws IOException, InterruptedException {

            List<String> line = Ar-
            rays.asList( value.toString().split(","));

            word.set(line.get(6).toString());

            context.write(word,one);

        }

    }

}
```



```
public static class Reduce extends Reducer<Text, IntWritable, Text, IntWritable> {

    public void reduce(Text key, Iterable<IntWritable> values, Context context)

        throws IOException, InterruptedException {

        int sum = 0;

        for (IntWritable val : values) {

            sum += val.get();

        }

        context.write(key, new IntWritable(sum));

    }

}

public static void main(String[] args) throws Exception {

    Configuration conf = new Configuration();

    Job job = new Job(conf, "Count");

    job.setOutputKeyClass(Text.class);

    job.setOutputValueClass(IntWritable.class);

    job.setMapperClass(Map.class);

    job.setReducerClass(Reduce.class);

    job.setInputFormatClass(TextInputFormat.class);

    job.setOutputFormatClass(TextOutputFormat.class);

    FileInputFormat.addInputPath(job, new Path(args[0]));

    FileOutputFormat.setOutputPath(job, new Path(args[1]));

    job.waitForCompletion(true);

}

}
```

```
hadoopusr@uthara-X542UQR:~$ hdfs dfs -cat outputcr/part-r-00000
21/09/13 10:12:08 WARN util.NativeCodeLoader: Unable to load nat
ARSON      3828
ASSAULT    121417
BATTERY    363538
BURGLARY   101902
CRIM SEXUAL ASSAULT  7079
CRIMINAL DAMAGE 220298
CRIMINAL TRESPASS  57770
DECEPTIVE PRACTICE  55751
DOMESTIC VIOLENCE  2
GAMBLING   4051
HOMICIDE    3172
INTERFERENCE WITH PUBLIC OFFICER  1701
INTIMIDATION  1312
IUCR        1
KIDNAPPING  3022
LIQUOR LAW VIOLATION  5384
MOTOR VEHICLE THEFT  98924
NARCOTICS   210600
NON-CRIMINAL  1
OBSCENITY   74
OFFENSE INVOLVING CHILDREN  11181
OTHER NARCOTIC VIOLATION  22
OTHER OFFENSE  123753
PROSTITUTION  25666
PUBLIC INDECENCY  29
PUBLIC PEACE VIOLATION  10145
Primary Type  1
RITUALISM    15
ROBBERY 70986
SEX OFFENSE  8535
STALKING     868
THEFT        395395
WEAPONS VIOLATION  17094
```

18CSC403 : Practical Big data Analytics

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Int.MSc.Data Science

CHICAGO CRIME DATA ANALYSIS USING MONGODB EVAL-2

1. Importing Data

mongoimport --type csv -c crimes --headerline -drop
Chicago_Crimes_2012_to_2017.csv

```
hadooppusur@uthara-X542UQR:~/Downloads$ mongoimport --type csv -c crimes --headerline -drop Chicago_Crimes_2012_to_2017.csv
connected to: localhost
2021-11-20T20:03:05.830+0530 [#####] rop.crimes 15.2MB/350MB (4.3%)
2021-11-20T20:03:08.716+0530 [#####] rop.crimes 35.8MB/350MB (10.2%)
2021-11-20T20:03:11.716+0530 [#####] rop.crimes 53.4MB/350MB (15.3%)
2021-11-20T20:03:17.716+0530 [#####] rop.crimes 70.0MB/350MB (20.0%)
2021-11-20T20:03:20.716+0530 [#####] rop.crimes 89.1MB/350MB (25.5%)
2021-11-20T20:03:23.716+0530 [#####] rop.crimes 110MB/350MB (31.3%)
2021-11-20T20:03:26.716+0530 [#####] rop.crimes 127MB/350MB (36.4%)
2021-11-20T20:03:29.716+0530 [#####] rop.crimes 145MB/350MB (41.4%)
2021-11-20T20:03:32.716+0530 [#####] rop.crimes 164MB/350MB (46.8%)
2021-11-20T20:03:35.716+0530 [#####] rop.crimes 187MB/350MB (53.5%)
2021-11-20T20:03:38.716+0530 [#####] rop.crimes 205MB/350MB (58.6%)
2021-11-20T20:03:41.716+0530 [#####] rop.crimes 215MB/350MB (61.5%)
2021-11-20T20:03:44.716+0530 [#####] rop.crimes 227MB/350MB (64.8%)
2021-11-20T20:03:47.716+0530 [#####] rop.crimes 246MB/350MB (70.4%)
2021-11-20T20:03:50.716+0530 [#####] rop.crimes 265MB/350MB (75.7%)
2021-11-20T20:03:53.716+0530 [#####] rop.crimes 284MB/350MB (81.3%)
2021-11-20T20:03:56.716+0530 [#####] rop.crimes 303MB/350MB (86.7%)
2021-11-20T20:03:59.716+0530 [#####] rop.crimes 317MB/350MB (90.6%)
2021-11-20T20:04:02.716+0530 [#####] rop.crimes 335MB/350MB (95.8%)
2021-11-20T20:04:05.627+0530 [#####] rop.crimes 350MB/350MB (100.0%)
imported 1456714 documents
```

```
> db.crimes.find().pretty();
{
  "_id" : ObjectId("618fe4276869abcf80b046dd"),
  "n" : 3,
  "ID" : 10508693,
  "Case Number" : "HZ250496",
  "Date" : "05/03/2016 11:40:00 PM",
  "Block" : "013XX S SAWYER AVE",
  "IUCR" : 486,
  "Primary Type" : "BATTERY",
  "Description" : "DOMESTIC BATTERY SIMPLE",
  "Location Description" : "APARTMENT",
  "Arrest" : "True",
  "Domestic" : "True",
  "Beat" : 1022,
  "District" : 10,
  "Ward" : 24,
  "Community Area" : 29,
  "FBI Code" : "08B",
  "X Coordinate" : 1154907,
  "Y Coordinate" : 1893681,
  "Year" : 2016,
  "Updated On" : "05/10/2016 03:56:50 PM",
  "Latitude" : 41.864073157,
  "Longitude" : -87.706818608,
  "Location" : "(41.864073157, -87.706818608)"
}
```

Details of crime that happend on 5th March 2016 at 11 PM

> db.crimes.find({Date : "05/03/2016 11:00:00 PM"}).pretty()

```
> db.crimes.find({Date : "05/03/2016 11:00:00 PM"}).pretty()
{
  "_id" : ObjectId("618fe4276869abcf80b046f0"),
  " " : 3264,
  "ID" : 10508752,
  "Case Number" : "HZ250500",
  "Date" : "05/03/2016 11:00:00 PM",
  "Block" : "043XX S ELLIS AVE",
  "IUCR" : 486,
  "Primary Type" : "BATTERY",
  "Description" : "DOMESTIC BATTERY SIMPLE",
  "Location Description" : "APARTMENT",
  "Arrest" : "False",
  "Domestic" : "True",
  "Beat" : 222,
  "District" : 2,
  "Ward" : 4,
  "Community Area" : 39,
  "FBI Code" : "08B",
  "X Coordinate" : 1183654,
  "Y Coordinate" : 1876344,
  "Year" : 2016,
  "Updated On" : "05/10/2016 03:56:50 PM",
  "Latitude" : 41.815875211,
  "Longitude" : -87.601832565,
  "Location" : "(41.815875211, -87.601832565)"
}
{
  "_id" : ObjectId("618fe4276869abcf80b046fa"),
  " " : 5770,
  "ID" : 10509094,
  "Case Number" : "HZ250662",
  "Date" : "05/03/2016 11:00:00 PM",
  "Block" : "084XX S MORGAN ST",
  "IUCR" : 910,
  "Primary Type" : "MOTOR VEHICLE THEFT",
  "Description" : "AUTOMOBILE",
  "Location Description" : "STREET",
  "Arrest" : "False",
  "Domestic" : "False",
  "Beat" : 613,
  "District" : 6,
  "Ward" : 21,
  "Community Area" : 71,
  "FBI Code" : 7,
  "X Coordinate" : 1171118,
  "Y Coordinate" : 1848917,
  "Year" : 2016,
  "Updated On" : "05/10/2016 03:56:50 PM",
  "Latitude" : 41.740895923,
  "Longitude" : -87.648617881,
  "Location" : "(41.740895923, -87.648617881)"
}
```

Details of Sexual Crimes and Crimes involving Children

```
> db.crimes.find({"Primary Type" : {$in : ["OFFENSE INVOLVING CHILDREN", "PROSTITUTION","CRIM SEXUAL ASSAULT","SEX OFFENSE", "OBSCENITY"]}}).pretty()
```

```
> db.crimes.find({"Primary Type" : {$in : ["OFFENSE INVOLVING CHILDREN", "PROSTITUTION","CRIM SEXUAL ASSAULT","SEX OFFENSE", "OBSCENITY"]}}).pretty()
{
  "_id" : ObjectId("618fe4286869abcf80b04767"),
  "n" : 31841,
  "ID" : 10509509,
  "Case Number" : "HZ250880",
  "Date" : "05/04/2016 08:00:00 AM",
  "Block" : "017XX W POLK ST",
  "IUCR" : 265,
  "Primary Type" : "CRIM SEXUAL ASSAULT",
  "Description" : "AGGRAVATED: OTHER",
  "Location Description" : "OTHER",
  "Arrest" : "False",
  "Domestic" : "False",
  "Beat" : 1231,
  "District" : 12,
  "Ward" : 2,
  "Community Area" : 28,
  "FBI Code" : 2,
  "X Coordinate" : 1164782,
  "Y Coordinate" : 1896486,
  "Year" : 2016,
  "Updated On" : "05/11/2016 03:50:55 PM",
  "Latitude" : 41.871566847,
  "Longitude" : -87.670488348,
  "Location" : "(41.871566847, -87.670488348)"
}
```

Details of Theft Crimes that happend after 2015

```
> db.crimes.find({"Primary Type" : "THEFT", Year:{$gt:2015}}).pretty()
```

```
> db.crimes.find({"Primary Type" : "THEFT", Year:{$gt:2015}}).pretty()
{
  "_id" : ObjectId("618fe4276869abcf80b046e1"),
  "n" : 911,
  "ID" : 10508699,
  "Case Number" : "HZ250455",
  "Date" : "05/03/2016 10:00:00 PM",
  "Block" : "003XX N LOTUS AVE",
  "IUCR" : 820,
  "Primary Type" : "THEFT",
  "Description" : "$500 AND UNDER",
  "Location Description" : "RESIDENCE",
  "Arrest" : "False",
  "Domestic" : "True",
  "Beat" : 1523,
  "District" : 15,
  "Ward" : 28,
  "Community Area" : 25,
  "FBI Code" : 6,
  "X Coordinate" : 1139890,
  "Y Coordinate" : 1901675,
  "Year" : 2016,
  "Updated On" : "05/10/2016 03:56:50 PM",
  "Latitude" : 41.886297242,
  "Longitude" : -87.761750709,
  "Location" : "(41.886297242, -87.761750709)"
}
```

Details of crimes happended on 5th March 2016

```
> db.crimes.find({Date : {$regex:"^05/11/2016"}}).pretty();
```

```
> db.crimes.find({Date : {$regex:"^05/11/2016"}}).pretty();
{
  "_id" : ObjectId("618fe4286869abcf80b05ddf"),
  " " : 794865,
  "ID" : 10517369,
  "Case Number" : "HZ259572",
  "Date" : "05/11/2016 12:15:00 AM",
  "Block" : "079XX S DOBSON AVE",
  "IUCR" : 2826,
  "Primary Type" : "OTHER OFFENSE",
  "Description" : "HARASSMENT BY ELECTRONIC MEANS",
  "Location Description" : "APARTMENT",
  "Arrest" : "False",
  "Domestic" : "False",
  "Beat" : 624,
  "District" : 6,
  "Ward" : 8,
  "Community Area" : 44,
  "FBI Code" : 26,
  "X Coordinate" : 1184602,
  "Y Coordinate" : 1852522,
  "Year" : 2016,
  "Updated On" : "05/18/2016 03:50:36 PM",
  "Latitude" : 41.75048339,
  "Longitude" : -87.599101334,
  "Location" : "(41.75048339, -87.599101334)"
}
```

Crimes that happened in morning hours(AM)

```
> db.crimes.find({Date : {$regex:/AM$/}}).pretty();
```

```
> db.crimes.find({Date : {$regex:/AM$/}}).pretty();
{
  "_id" : ObjectId("618fe4276869abcf80b046ea"),
  " " : 2279,
  "ID" : 10508724,
  "Case Number" : "HZ250513",
  "Date" : "05/03/2016 09:00:00 AM",
  "Block" : "028XX S DR MARTIN LUTHER KING JR DR",
  "IUCR" : 820,
  "Primary Type" : "THEFT",
  "Description" : "$500 AND UNDER",
  "Location Description" : "STREET",
  "Arrest" : "False",
  "Domestic" : "False",
  "Beat" : 133,
  "District" : 1,
  "Ward" : 4,
  "Community Area" : 35,
  "FBI Code" : 6,
  "X Coordinate" : 1179375,
  "Y Coordinate" : 1886199,
  "Year" : 2016,
  "Updated On" : "05/10/2016 03:56:50 PM",
  "Latitude" : 41.843016958,
  "Longitude" : -87.61722727,
  "Location" : "(41.843016958, -87.61722727)"
}
```



```
> db.crimes.count({Date : {$regex:/AM$/}});
```

```
> db.crimes.count({Date : {$regex:/AM$/}});  
536845
```

Crimes involving gun

```
> db.crimes.find({Description : {$in : [/GUN/,  
/FIREARM/]} }).pretty();
```

```
> db.crimes.find({Description : {$in : [/GUN/, /OVER/]} }).pretty();  
{  
  "_id" : ObjectId("618fe4276869abcf80b046e2"),  
  " " : 1108,  
  "ID" : 10508702,  
  "Case Number" : "HZ250447",  
  "Date" : "05/03/2016 10:35:00 PM",  
  "Block" : "082XX S MARYLAND AVE",  
  "IUCR" : "041A",  
  "Primary Type" : "BATTERY",  
  "Description" : "AGGRAVATED: HANDGUN",  
  "Location Description" : "STREET",  
  "Arrest" : "False",  
  "Domestic" : "False",  
  "Beat" : 631,  
  "District" : 6,  
  "Ward" : 8,  
  "Community Area" : 44,  
  "FBI Code" : "04B",  
  "X Coordinate" : 1183336,  
  "Y Coordinate" : 1850642,  
  "Year" : 2016,  
  "Updated On" : "05/10/2016 03:56:50 PM",  
  "Latitude" : 41.745354023,  
  "Longitude" : -87.603798903,  
  "Location" : "(41.745354023, -87.603798903)"  
}
```

```
> db.crimes.count({Description : {$in : [/GUN/, /FIREARM/]} })
```

```
> db.crimes.count({Description : {$in : [/GUN/, /FIREARM/]} })  
60708
```


Find 3 locations of crime sorted in reverse alphabetical Order skipping the last one

```
> db.crimes.find().sort({Location :-1}).skip(1).limit(3);
```

```
> db.crimes.find().sort({Location :-1}).skip(1).limit(3);
{ "_id" : ObjectId("618fe43f6869abcf80b8ad6f"), "Block" : 2884959, "ID" : 9183513, "Location" : "HOTEL/MOTEL", "Description" : "POCKET-PICKING", "Location Description" : "HOTEL/MOTEL", "FBI Code" : 6, "X Coordinate" : 1162551, "Y Coordinate" : 1951535, "Year" : 2013, "Update Date" : "2013-07-13T18:58:17-07:00" }
{ "_id" : ObjectId("618fe4606869abcf80c3fc80"), "Block" : 6069412, "ID" : 10562290, "Location" : "OTHER OFFENSE", "Description" : "PAROLE VIOLATION", "Location Description" : "OTHER OFFENSE", "FBI Code" : 26, "X Coordinate" : 1162551, "Y Coordinate" : 1951535, "Year" : 2016, "Update Date" : "2016-07-13T18:58:17-07:00" }
{ "_id" : ObjectId("618fe4376869abcf80b5a866"), "Block" : 2686701, "ID" : 8863012, "Location" : "MOTOR VEHICLE THEFT", "Description" : "ATT: AUTOMOBILE", "Location Description" : "MOTOR VEHICLE THEFT", "FBI Code" : 7, "X Coordinate" : 1165543, "Y Coordinate" : 1951527, "Year" : 2016, "Update Date" : "2016-07-13T18:58:17-07:00" }
```

Names of different Blocks in city of chicago

```
> db.crimes.aggregate({$group:{_id : "$Block" }});
```

```
> db.crimes.aggregate({$group:{_id : "$Block" }});
{ "_id" : "016XX W Superior St" }
{ "_id" : "041XX N Troy St" }
{ "_id" : "047XX W 83RD PL" }
{ "_id" : "009XX N Kingsbury St" }
{ "_id" : "011XX N MOZART st" }
{ "_id" : "082XX W SCHOOL ST" }
{ "_id" : "014XX W Fillmore St" }
{ "_id" : "094XX S HARPER AVE" }
{ "_id" : "004XX N Green St" }
{ "_id" : "036XX E 134TH ST" }
{ "_id" : "025XX N Linden pl" }
{ "_id" : "041XX W 24th PL" }
{ "_id" : "020XX N Clark ST" }
{ "_id" : "045XX W CARMEN AVE" }
{ "_id" : "006XX W Grace St" }
{ "_id" : "0000X E ohio st" }
{ "_id" : "015XX W Roscoe St" }
{ "_id" : "016XX W CHELSEA PL" }
{ "_id" : "057XX S Michigan Ave" }
{ "_id" : "053XX N OVERHILL AVE" }
```

Which are more Domestic or non domestic crimes

```
> db.crimes.aggregate({$group:{_id : "$Block" , DomesticCount : { $max : "$Domestic" }}});
```

```
> db.crimes.aggregate({$group:{_id : "$Block" , DomesticCount : {$max :
  "$Domestic"}}});
{ "_id" : "016XX W Superior St", "DomesticCount" : "False" }
```

Count of different types of crimes

```
> db.crimes.aggregate([ {"$group" : { _id : "$Primary Type", count : {$sum : 1 }}} ])
```

```
> db.crimes.aggregate([ {"$group" : { _id : "$Primary Type", count : {$sum : 1 }}} ])
```

```
{ "_id" : "NON-CRIMINAL (SUBJECT SPECIFIED)", "count" : 4 }
```

```
{ "_id" : "OTHER NARCOTIC VIOLATION", "count" : 30 }
```

```
{ "_id" : "BURGLARY", "count" : 83397 }
```

```
{ "_id" : "CRIMINAL DAMAGE", "count" : 155455 }
```

```
{ "_id" : "CONCEALED CARRY LICENSE VIOLATION", "count" : 90 }
```

```
{ "_id" : "WEAPONS VIOLATION", "count" : 17233 }
```

```
{ "_id" : "NON - CRIMINAL", "count" : 38 }
```

```
{ "_id" : "LIQUOR LAW VIOLATION", "count" : 1953 }
```

```
{ "_id" : "DECEPTIVE PRACTICE", "count" : 75495 }
```

```
{ "_id" : "ASSAULT", "count" : 91289 }
```

```
{ "_id" : "ARSON", "count" : 2217 }
```

```
{ "_id" : "STALKING", "count" : 828 }
```

```
{ "_id" : "ROBBERY", "count" : 57313 }
```

```
{ "_id" : "CRIMINAL TRESPASS", "count" : 36912 }
```

```
{ "_id" : "MOTOR VEHICLE THEFT", "count" : 61138 }
```

```
{ "_id" : "THEFT", "count" : 329460 }
```

```
{ "_id" : "NON-CRIMINAL", "count" : 93 }
```

```
{ "_id" : "PUBLIC PEACE VIOLATION", "count" : 13122 }
```

```
{ "_id" : "BATTERY", "count" : 263700 }
```

```
{ "_id" : "KIDNAPPING", "count" : 1099 }
```

Count of arrests made and non arrests in each district

```
> db.crimes.aggregate([ {"$group" : { _id : { District : "$District", Arrests : "$Arrest"
}, count : {$sum : 1 }}} ])
```

```
> db.crimes.aggregate([ {"$group" : { _id : { District : "$District", Arrests : "$Arrest" }, count : {$sum : 1 }}} ])
```

```
{ "_id" : { "District" : "", "Arrests" : "True" }, "count" : 1 }
```

```
{ "_id" : { "District" : 13, "Arrests" : "False" }, "count" : 1 }
```

```
{ "_id" : { "District" : 14, "Arrests" : "True" }, "count" : 8872 }
```

```
{ "_id" : { "District" : 4, "Arrests" : "True" }, "count" : 20435 }
```

```
{ "_id" : { "District" : 17, "Arrests" : "True" }, "count" : 7251 }
```

```
{ "_id" : { "District" : 9, "Arrests" : "True" }, "count" : 18627 }
```

```
{ "_id" : { "District" : 1, "Arrests" : "True" }, "count" : 15376 }
```

```
{ "_id" : { "District" : 16, "Arrests" : "True" }, "count" : 9299 }
```

```
{ "_id" : { "District" : 7, "Arrests" : "True" }, "count" : 25820 }
```

```
{ "_id" : { "District" : 2, "Arrests" : "True" }, "count" : 12845 }
```

```
{ "_id" : { "District" : 8, "Arrests" : "True" }, "count" : 22730 }
```

```
{ "_id" : { "District" : 8, "Arrests" : "False" }, "count" : 73595 }
```

```
{ "_id" : { "District" : 12, "Arrests" : "True" }, "count" : 12972 }
```

```
{ "_id" : { "District" : 7, "Arrests" : "False" }, "count" : 58553 }
```

```
{ "_id" : { "District" : 3, "Arrests" : "False" }, "count" : 54681 }
```

```
{ "_id" : { "District" : 6, "Arrests" : "True" }, "count" : 23766 }
```

```
{ "_id" : { "District" : 15, "Arrests" : "True" }, "count" : 24370 }
```

```
{ "_id" : { "District" : 10, "Arrests" : "True" }, "count" : 20402 }
```

```
{ "_id" : { "District" : 31, "Arrests" : "False" }, "count" : 5 }
```

```
{ "_id" : { "District" : 12, "Arrests" : "False" }, "count" : 56510 }
```