Description and Summarization

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1 Average Salary per District

```
COPY(SELECT dpu.unit_name,dpu.description,
to_char(AVG(dsa.salary),'99999999999999999D99') AS average_salary,
to_char(STDDEV(dsa.salary),'99999999999999999D99') AS std_salary
FROM data_policeunit dpu,
(SELECT doh.unit_id, ds.salary FROM data_officerhistory doh, data_salary ds
WHERE doh.officer_id = ds.officer_id AND doh.end_date IS NULL AND ds.year = 2017) AS dsa
WHERE dpu.id=dsa.unit_id
GROUP BY dpu.unit_name,dpu.description
ORDER BY dpu.unit_name)
TO '/tmp/output.csv' CSV HEADER;
```

Table 1: Salary Table 2017(not all rows shown)

unit_name	description	average_salary	std_salary
1	District 001	93800.4	9305.97
2	District 002	91693.62	10933.91
3	District 003	88514.02	10068.22
4	District 004	89908.49	10040.9
5	District 005	90017.43	10677.43
6	District 006	89490.69	10521.14
7	District 007	88657.09	9464.79
8	District 008	90738.19	9899.81
9	District 009	91636.58	9850.67
10	District 010	89877.26	10271.7
11	District 011	88520.31	10069.87
12	District 012	92953.5	8584.53
14	District 014	92744.18	10674.98
15	District 015	88710	10329.24
16	District 016	94471.69	10731.43
17	District 017	93950.43	10392.33
18	District 018	92892.31	9675.62
19	District 019	91314.05	9090.66
20	District 020	94331.41	10008.83
22	District 022	93824.06	10107.41
24	District 024	92206.08	9863.78
25	District 025	90558.67	10146.9
26	Executive Officers Unit	135621	1344.77
55	Mounted Unit	98157.71	8565.4
341	Canine Unit	99928	7519.92

We took only salaries from 2017 for officers currently in the service for the above table. From the table it generally looks like the average salaries hover around 90k, and there doesn't seem to be a significant difference

between districts. It is interesting to look at some of the specialized units like the mounted or canine units and compare to the base police officer salary. Initially we had wondered whether officers would be paid more in nicer districts, possibly to cover the cost of living there, or whether they might be paid more in more dangerous districts. Neither seems to be the case, which makes sense assuming they all fall under one governing body, which they do. It would probably not be ideal to incentivize moving districts too often.

2 Allegations per District

Code

```
COPY(
SELECT da.name, COUNT(DISTINCT dal.crid) AS num_allegations
FROM data_area da, data_allegation dal
WHERE da.area_type='police-districts' AND ST_Intersects(dal.point,da.polygon)
GROUP BY da.name
ORDER BY num_allegations DESC)
TO '/tmp/allegations.csv' CSV HEADER;
```

District Name	num_allegations
1st	10721
11th	10009
8th	9172
7th	8993
9th	8945
12th	8465
2nd	8072
6th	7862
4th	7836
19th	7020
18th	6672
5th	6659
3rd	6650
25th	6458
10th	6101
14th	5394
15th	5289
22nd	4910
16th	4274
24th	4181
17th	3180
20th	2876
31st	108

The allegations table shows that a few districts, namely the 1st and 11th, have quite a bit more allegations than the other districts. The Loop is an extremely busy area for both tourists and commuters heading to work, leading to lots of police interactions. The next few districts are in rougher neighborhoods, where again we'd expect to see more police actions and thus more complaints. These are also majority minority neighborhoods, so it's possible this plays a part in the high number of complaints.

Note: Some of the allegations are locationless. I'm not entirely sure how to handle these going forward, it may be better to do what we were doing initially, and try to trace the current officer district at the incident date.

3 Complaint and Resignation Dates

Code

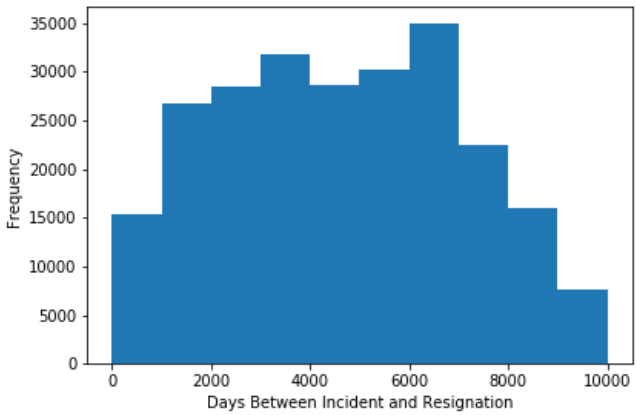
```
COPY(SELECT dof.id, dof.first_name, dof.last_name, da.incident_date,
dof.resignation_date,
EXTRACT(day FROM COALESCE(dof.resignation_date,'2018-10-22') - da.incident_date)
        AS days_between
FROM data_officer dof, data_officerallegation doa, data_allegation da
WHERE dof.id = doa.officer_id AND doa.allegation_id=da.id
ORDER BY dof.id)
TO '/tmp/output.csv' CSV HEADER;
```

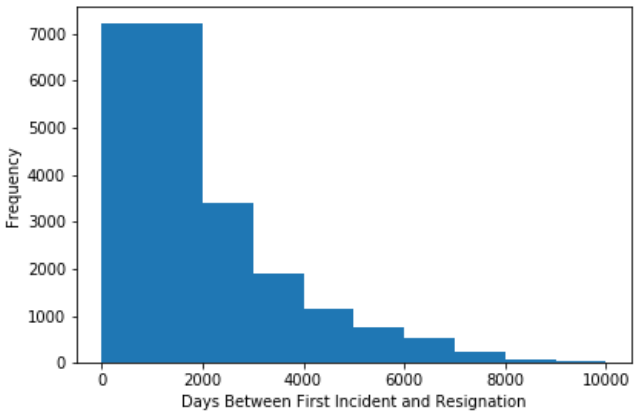
Output (first few lines)

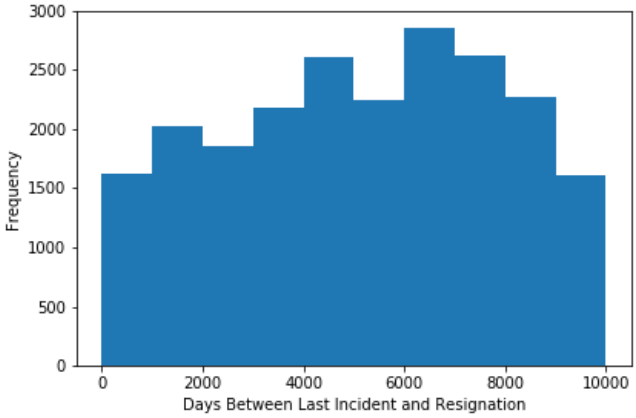
id	first_name	last_name	incident_date	resignation_date	days_between
4	Carmel	Abbate	1992-02-10 18:00:00-06	2003-08-15	4203
4	Carmel	Abbate	2000-08-15 19:00:00-05	2003-08-15	1094
4	Carmel	Abbate	2000-08-15 19:00:00-05	2003-08-15	1094
4	Carmel	Abbate	1999-04-18 19:00:00-05	2003-08-15	1579
4	Carmel	Abbate	1995-07-11 19:00:00-05	2003-08-15	2956
4	Carmel	Abbate	1995-11-15 18:00:00-06	2003-08-15	2829
4	Carmel	Abbate	1994-07-29 19:00:00-05	2003-08-15	3303
5	Carmen	Abbate	1992-10-18 19:00:00-05	1993-06-04	228
5	Carmen	Abbate	1991-10-11 19:00:00-05	1993-06-04	601
5	Carmen	Abbate	1991-06-03 19:00:00-05	1993-06-04	731
5	Carmen	Abbate	1992-11-01 18:00:00-06	1993-06-04	214
6	Anthony	Abbate	1999-11-18 18:00:00-06	2009-12-22	3686
6	Anthony	Abbate	2001-11-22 18:00:00-06	2009-12-22	2951
6	Anthony	Abbate	2007-02-18 18:00:00-06	2009-12-22	1037
6	Anthony	Abbate	2004-11-20 18:00:00-06	2009-12-22	1857
6	Anthony	Abbate	2007-03-22 19:00:00-05	2009-12-22	1005
6	Anthony	Abbate	1997-05-20 19:00:00-05	2009-12-22	4598
8	Leon	Abbey	2001-04-19 19:00:00-05	2008-11-26	2777
8	Leon	Abbey	2006-01-05 18:00:00-06	2008-11-26	1055
9	Michael	Abbey	1989-10-01 19:00:00-05	1991-07-26	662
9	Michael	Abbey	1990-03-25 18:00:00-06	1991-07-26	487
9	Michael	Abbey	1989-10-05 19:00:00-05	1991-07-26	658

The dates table provides some interesting information, but without some more analysis it's hard to draw any conclusions. Some officers go for years after getting complaints, some resign soon. To improve upon this we would probably make a table with the date of the first complaint, last complaint, resignation date, days between each, and also number of complaints each. From there we might be able to glean more information about the correlation.

The plots below look into some of these relations. In these cases I replaced the resignation date with today's date for empty values—this may introduce some errors for officers whose resignation dates exist, but weren't recorded, so I've cut off any extreme outlier values in the plots, of which there aren't many. The first plot shows the time in days between an allegation and resignation date for an officer. This includes all complaints, so for any officer that has multiple complaints, they'll show up multiple times. The second and third are more refined, showing the time between the first complaint and last complaint, respectively. Note that the third plot includes the second plot for officers who only received one complaint. The second plot shows us that often an officer will resign shortly after their first complaint, however the third plot shows almost no relation between the dates. Cynically I would assume that it's much easier to oust a junior officer, who would be getting their first complaint. On the other hand, officers receiving a lot of complaints are probably older and higher up in the police hierarchy and thus harder to fire altogether. It would also be helpful to look into the amount of time it takes for complaints to go through the database in general. Looking at the plots, 2000 days is over 5 years, which seems like a long amount of time between the complaint and resignation, so it's hard to tell if the complaint was actually the cause. On the other hand, maybe police departments wait until a bit later to fire officers ostensibly for other transgressions.







4 Average Salary by Rank

Code

```
SELECT ds.rank,
  to_char(
  AVG(ds.salary), '99999999999999999D99')
  AS average_salary
FROM data_salary ds
GROUP BY ds.rank;
```

Output

rank	average_salary
Commander	142260.28
Assistant Superintendent	180492.00
Deputy Chief	151326.22
Field Training Officer	77357.17
Detective	83630.82
Superintendent'S Chief Of Staff	158337.00
Investigator	68444.66
First Deputy Superintendent	172056.38
Captain	135291.60
Sergeant	91771.54
Deputy Superintendent	153411.11
General Counsel	143630.21
Chief	171202.08
Civilian	131037.32
Lieutenant	122029.45
Police Officer	71814.93

The salary by rank is straightforward, and lines up with what we know of the police department hierarchy. It is interesting to see the Assistant Superintendent as the highest paid, but it appears that the superintendent isn't on the list. The civilian entry is probably some sort of error in the database that would be worth investigating.