Description and Summarization

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1 Average Salary per District

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

Output- there are a lot more rows we didn't include but are output by the query

unit_name	description	average_salary	std_salary
1	District 001	79064.02	17978.26
2	District 002	77256.34	15402.32
3	District 003	76162.29	16194.95
4	District 004	76735.87	16658.48
5	District 005	77075.2	16487.53
6	District 006	76741.03	16712.11
7	District 007	76400.79	16155.5
8	District 008	76959.9	15792.98
9	District 009	77530.3	15993.72
10	District 010	77545.42	16779.81
11	District 011	77907.7	17523.12
12	District 012	78320.26	16878.12
13	District 013	79438.15	17785.32
14	District 014	78479.82	16597.87
15	District 015	77536.95	16772.95
16	District 016	77774.94	15479.94
17	District 017	78412.75	16174.04
18	District 018	77907.07	16258.87
19	District 019	77020.29	15432.97
20	District 020	78697.35	17058.13
21	District 021	78697.72	16257.21
22	District 022	77499.63	14673.31
23	District 023	78217.89	15900
24	District 024	78099.61	16276.85
25	District 025	77315.81	16729.37
26	Executive Officers Unit	107119.46	35073.21
55	Mounted Unit	80333.32	15857.89

From the salary table, we can see that most districts are about the same. The average is roughly 77k, with some districts a bit higher and some lower. It would be interesting to compare to the civilian median income for each

district. It is also interesting to look at the other units, i.e. the Mounted Unit or Bomb Squad. We had initially guessed that police officer pay would be higher in nicer neighborhoods, but for the most part it's the same across the board. This kind of makes logical sense, as having the pay higher in certain areas of the city would incentivize officers to move around. In this way, most neighborhoods would get officers of the same quality (for the most part). On some level we would almost expect officers to be paid more to police more 'dangerous' districts, but we also don't see this. I would be interested in learning why this isn't the case, but in some respects I imagine it might be a budget issue.

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;
```

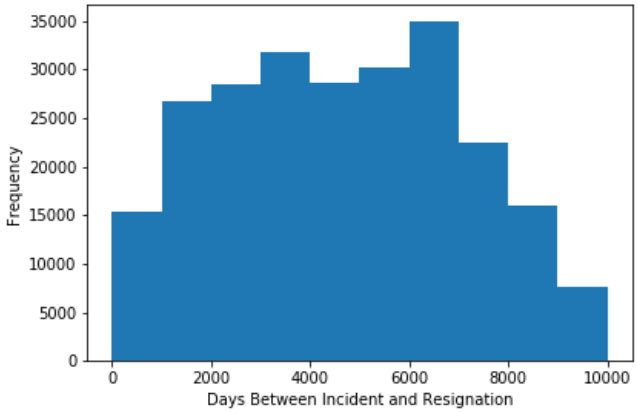
Output (first few lines)

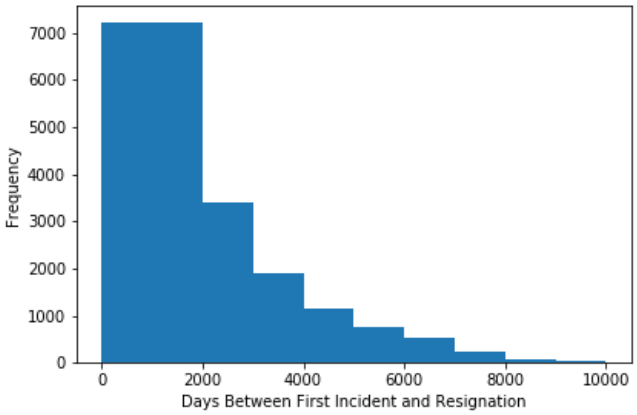
id	first_name	last_name	incident_date	resignation_date	days_between
4	Carmel	Abbate	1992-02-10 18:00:00-06	2003-08-15	4203
4	Carmel	Abbate	2000-08-15 19:00:00-05	2003-08-15	1094
4	Carmel	Abbate	2000-08-15 19:00:00-05	2003-08-15	1094
4	Carmel	Abbate	1999-04-18 19:00:00-05	2003-08-15	1579
4	Carmel	Abbate	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

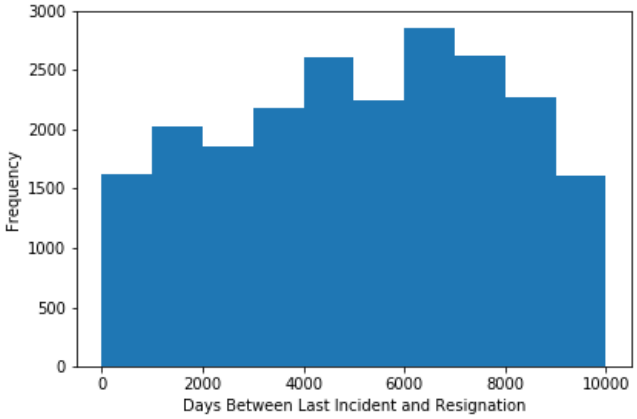
The dates table provides some interesting information, but without some more analysis it's hard to draw any conclusions. Some officers go for years after getting complaints, some resign soon. To improve upon this we would probably make a table with the date of the first complaint, last complaint, resignation 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.