Data Science Seminar: Checkpoint 1 Findings

The Earnest Pirates
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Checkpoint 1: Relational Analytics

Introduction -

We aim to analyze and evaluate the relationship between the various available features of police officers to assess if they have a significant impact on the trends observed on sustained allegations. This means that if an officer is White and belongs to senior ranking, does the trend vary as compared to a junior officer with a different race. The idea is to use this information and leverage it to gain further insights into the category of allegations. This could potentially help to identify if groups of officers who have similar features also follow similar trends in terms of allegations they receive. This idea can further help to explore if this information can help to point out corresponding relationships with features of victims, i.e., similar groups target similar victims in a similar way.

Relational Analytics Questions -

Q1. What is the relationship between police units and the number of allegations?
Q2. Are complaints against junior police officers sustained more often as compared to senior police officers?
Q3. What is the relation between the race of the police officers and the number of complaints against him/her and number of complaints sustained?
Q4. What is the maximum occurring category for the allegations against each police officer?
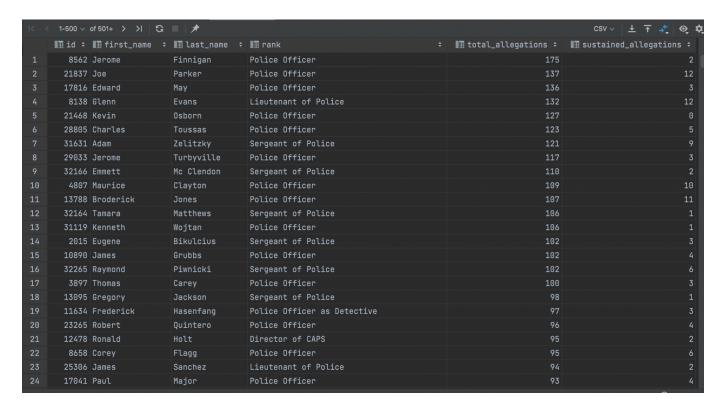
Results -

Q1. What is the average per-officer-allegation-count in a police unit?

The query aimed at identifying the count of allegations with respect to the different police units and then calculating the per-officer-allegation-count . This can be used to identify the average allegations levied against a police officer in a particular unit.

	police_unit	count_allegations	total_officers	allegation_ratio_per_unit
1	97	91	3	30.33
2	173	664	27	24.59
3	175	452	19	23.78
4	113	22	1	22
5	104	22	1	22
6	180	393	19	20.68
7	174	536	26	20.61
8	266	525	26	20.19
9	165	120	6	20
10	156	76	4	19
11	157	128	7	18.28
12	178	1043	58	17.98
13	228	161	9	17.88
14	149	6949	401	17.32
15	183	686	40	17.15
16	160	50	3	16.66
17	177	33	2	16.5
18	79	161	10	16.1
19	153	3410	226	15.08
20	119	1493	102	14.63
21	189	379	26	14.57
22	202	466	32	14.56
23	68	58	4	14.5
24	27	353	26	13.57
25	188	148	11	13.45

The above image depicts the per-officer-allegation-count in a police unit ordered in descending order of the allegations per officer ratio. It shows that police unit 97 has the maximum allegations ratio per officer per unit of 30.33. This means that officers in this unit are more likely to be involved in misconduct.

Q2. Are complaints against junior police officers sustained more often as compared to senior police officers? i.e. do senior officers take advantage of their positions to get the allegations levied against them to be dropped?

	id	first_name	last_name	rank	total_allegations	sustained_allegations
1	8562	Jerome	Finnigan	Police Officer	175	2
2	21837	Joe	Parker	Police Officer	137	12
3	17816	Edward	May	Police Officer	136	3
4	8138	Glenn	Evans	Lieutenant of Police	132	12
5	21468	Kevin	Osborn	Police Officer	127	0
6	28805	Charles	Toussas	Police Officer	123	5
7	31631	Adam	Zelitzky	Sergeant of Police	121	9
8	29033	Jerome	Turbyville	Police Officer	117	3
9	32166	Emmett	Mc Clendon	Sergeant of Police	110	2
10	4807	Maurice	Clayton	Police Officer	109	10
11	13788	Broderick	Jones	Police Officer	107	11
12	32164	Tamara	Matthews	Sergeant of Police	106	1
13	31119	Kenneth	Wojtan	Police Officer	106	1
14	2015	Eugene	Bikulcius	Sergeant of Police	102	3
15	10890	James	Grubbs	Police Officer	102	4
16	32265	Raymond	Piwnicki	Sergeant of Police	102	6
17	3897	Thomas	Carey	Police Officer	100	3
18	13095	Gregory	Jackson	Sergeant of Police	98	1
19	11634	Frederick	Hasenfang	Police Officer as Detective	97	3
20	23265	Robert	Quintero	Police Officer	96	4
21	12478	Ronald	Holt	Director of CAPS	95	2
22	8658	Corey	Flagg	Police Officer	95	6
23	25306	James	Sanchez	Lieutenant of Police	94	2
24	17041	Paul	Major	Police Officer	93	4

The result is ordered in descending order of count of total number of allegations against a police officer to identify the relationship between rank of a police officer and the number of complaints sustained.

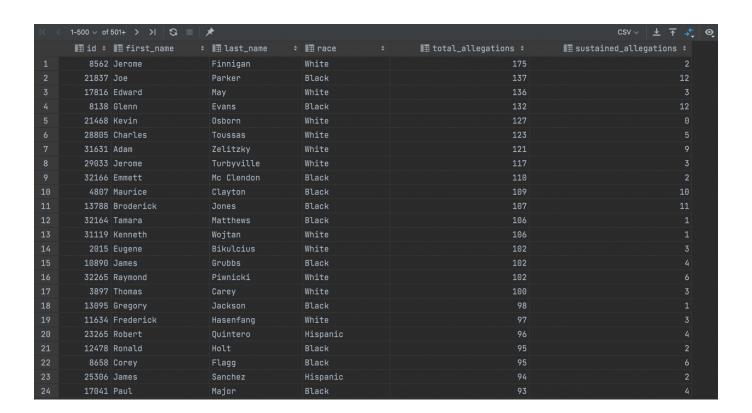|	rank	total_allegations	sustained_allegations	percent
1	Police Officer Assigned as Armorer	1	1	100
2	Police Officer Assigned Substance Abuse Counselor	5	3	60
3	Unknown	5	3	60
4	Clerk IV	16	9	56.25
5	District Watch Commander	9	5	55.56
6	Extradition Officer	2	1	50
7	Pr Clerk	9	4	44.44
8	Police Officer Legal Officer II	3	1	33.33
9	Police Officer / Mounted Patrol Officer	952	294	30.88
10	Police Officer (Per Arbitration Award)	341	104	30.5

A dive deeper into the output brings us to the conclusion that police officers with lower ranks are more likely to be disciplined as compared to their higher ranking counterparts.

rank	total_allegations	sustained_allegations	percent
58 Director of CAPS	95	2	2.11
59 Chief	300	6	2
60 Lab Tech III	4	0	0
61 Commander Of General Support	2	0	0
62 Police Aide	3	0	0
63 Police Forensic Investigator II	3	0	0
64 SR Evidence Technician	9	0	0
65 Explosives Tech II	5	0	0
66 Police Lab Tech IV	1	0	0
67 Police Lab Tech II	5	0	0
68 Commander Of Neighborhood Relations	1	0	0
69 Principal Stenographer	4	0	0
70 Director Of Human Resources	6	0	0
71 Director Of Motor Maintenance	4	0	0
72 Police Communications Operator I	3	0	0
73 F/A Id Tech II	3	0	0
74 Physical Fitness Coordinator	2	0	0
75 Deputy Director	36	0	0
76 Deputy Chief Administrator	14	0	0
77 Director Management / Labor Affairs	2	0	0
78 Police Forensic Investigator III	4	0	0
79 Superintendent's Chief Of Staff	1	0	0
80 Explosives Tech III	12	0	0
81 Detective	41	0	0

After seeing the relation between rank of officers and allegations against them which are sustained it can be seen that the percent of sustained allegations is very low for police officers with higher rank. This could possibly mean that the officers who hold a senior position could be using their power to get the allegations against them to be dropped.

Q3. What is the relation between the race of the police officers and the number of complaints against him/her and number of complaints sustained?

Here we can see the total allegations and total allegations sustained against one police officer and we can gain an insight most alleged police officer

	id	first_name	last_name	race	total_allegations	sustained_allegations
1	8562	Jerome	Finnigan	White	175	2
2	21837	Joe	Parker	Black	137	12
3	17816	Edward	May	White	136	3
4	8138	Glenn	Evans	Black	132	12
5	21468	Kevin	Osborn	White	127	0
6	28805	Charles	Toussas	White	123	5
7	31631	Adam	Zelitzky	White	121	9
8	29033	Jerome	Turbyville	White	117	3
9	32166	Emmett	Mc Clendon	Black	110	2
10	4807	Maurice	Clayton	Black	109	10
11	13788	Broderick	Jones	Black	107	11
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16	32265	Raymond	Piwnicki	White	102	6
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18	13095	Gregory	Jackson	Black	98	1
19	11634	Frederick	Hasenfang	White	97	3
20	23265	Robert	Quintero	Hispanic	96	4
21	12478	Ronald	Holt	Black	95	2
22	8658	Corey	Flagg	Black	95	6
23	25306	James	Sanchez	Hispanic	94	2
24	17041	Paul	Major	Black	93	4

Later we grouped the officers based on their race and gained insight for a particular race of officer, how much percent of allegations are sustained. It is seen that the sustained ratio is double for officers who are black.

	race	total_allegations	sustained_allegations	percent
1	White	137448	8078	5.88
2	Black	68108	8274	12.15
3	Hispanic	39534	2324	5.88
4	Asian/Pacific	3950	211	5.34
5	Native American/Alaskan Native	660	45	6.82
6	Unknown	88	13	14.77

Q4. What is the maximum occurring category for the allegations against each police officer?

The objective of the query was to gain insight into the distribution of categories of different allegations against each police officer. We however identified that most of the allegations belonged to a single category for every officer with remaining allegations distributed across other categories.

	first_name	last_name	rank	total_allegations	most_common_category
1	Jerome	Finnigan	Police Officer	173	Verbal Abuse
2	Joe	Parker	Police Officer	137	Verbal Abuse
3	Edward	May	Police Officer	136	Verbal Abuse
4	Glenn	Evans	Lieutenant of Police	128	Verbal Abuse
5	Kevin	Osborn	Police Officer	127	Verbal Abuse

The above image thus depicts the results of the query that looks at the most common category of allegations against each police officer.

In order to dive deeper into which category of allegation have the most and least counts we found the following results -

	category	total_allegations
1	Operation/Personnel Violations	78356
2	Use Of Force	57574
3	Illegal Search	37611
4	Lockup Procedures	14396
5	Verbal Abuse	13795

The above image depicts the top 5 categories in which allegations are registered. This shows that most allegations are regarding personnel violations.

15	First Amendment	77
16	Unknown	64
17	Racial Profiling	56
18	Excessive Force	31
19	Medical	30

The allegations fall into the above categories least number of times with allegations regarding medical being the lowest.

With this calculation we aimed to gain insight into the kind of allegations that are received against the police officers and if there are certain categories that occur more frequently than others. Therefore, the preconceived notion is supported by the result from the data in cpdb.

References -
[1] https://caselaw.findlaw.com/il-court-of-appeals/1479286.html