

Traffic Congestion Prediction.

Using some data that was isolated we managed to have an in depth look and the type of data we may potentially use from our dataset as features for training our algorithm. The data that was selected from Dataset 3 – road_traffic_counts_hourly_sample. The data that was isolated was Station keys, and the traffic count at every hour of the day (0-23). For the sake of visualisation, we changed the station keys into A, B and C.

Below is the extracted data (Table 1 – Extracted data for station A, B, and C) that we used to visualise and do some manual calculations to figure out what features the algorithm would need imputed and it would predict. We concluded that inputted data (Count – number of cars and the time – hour) would be used to calculate the hourly average of each station. This calculated Average would be our threshold for the Algorithm. Implying any number above the average would be considered a congestion in that station.

After tabulating data, I decided to visualise the data using a trend line. I decided on a Moving Average with a period of 2 because it seemed like the most suitable for our data. This allowed us to visualise the dataset in a more meaningful way, rather than just looking at a table with an overwhelming number of rows and columns. We conclude that the model would predict traffic count based on the trend lines for each station (polynomial regression method)

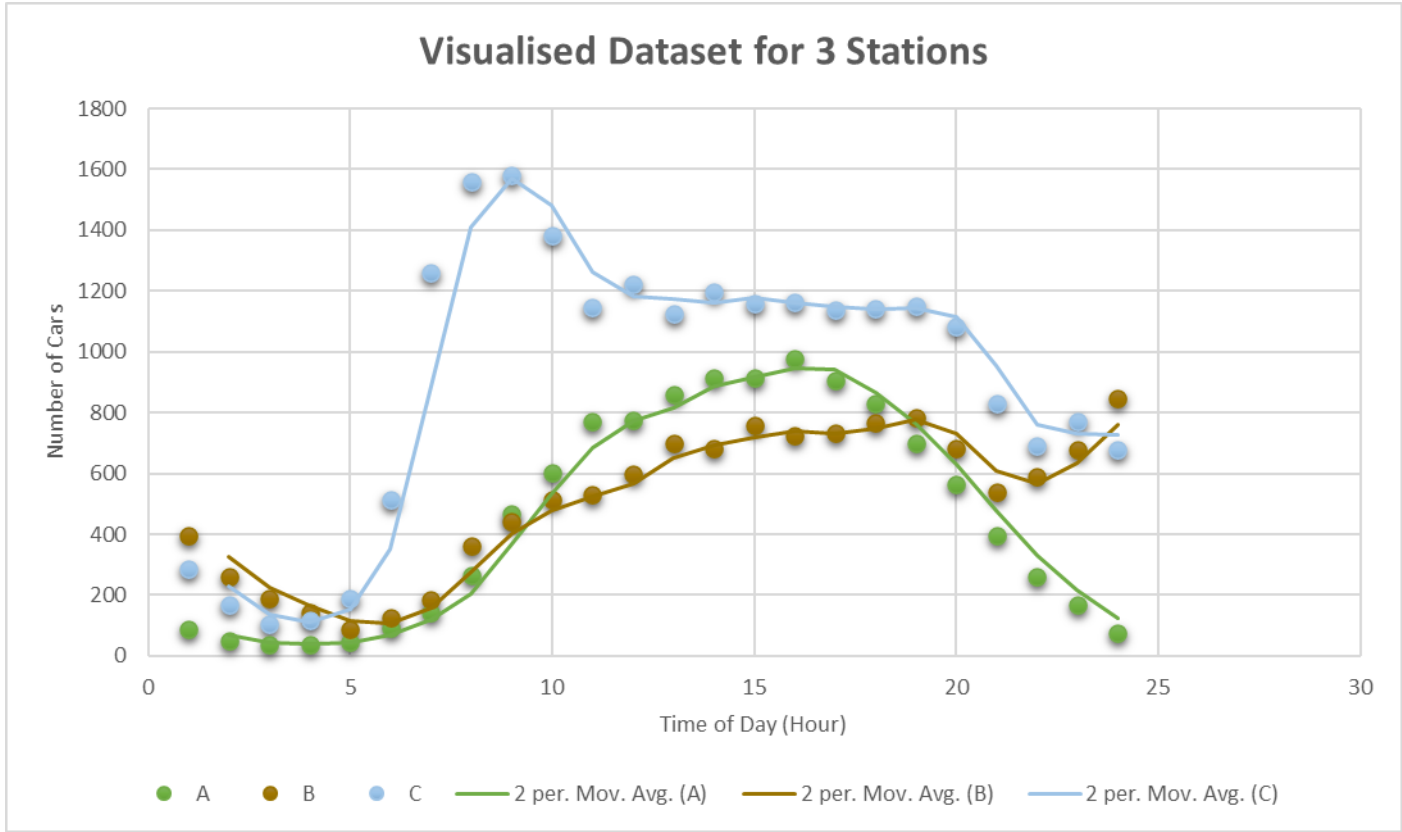
Below is the graph for visualising our dataset (Graph 1 – Graph to Visualise Tabled Data of 3 Stations)

station_key	hour_00	hour_01	hour_02	hour_03	hour_04	hour_05	hour_06	hour_07	hour_08	hour_09	hour_10	hour_11	hour_12	hour_13	hour_14	hour_15	hour_16	hour_17	hour_18	hour_19	hour_20	hour_21	hour_22	hour_23
A	88	52	38	39	45	94	144	267	466	601	770	774	858	916	915	978	904	831	699	563	396	263	169	77
A	35	26	22	37	114	293	401	447	464	467	511	487	531	591	596	654	712	645	397	247	183	160	103	65
A	49	66	62	102	106	134	146	161	198	172	169	139	171	146	142	143	132	84	96	73	44	61	80	68
A	55	54	59	105	84	79	144	131	156	146	135	143	134	113	136	123	113	103	89	58	44	50	62	65
A	68	40	25	21	66	206	511	763	780	588	570	566	514	482	500	614	608	630	502	290	280	212	160	95
A	129	128	61	34	67	161	185	378	495	638	728	740	772	672	740	747	783	737	586	437	340	266	164	106
A	66	29	17	41	80	244	585	816	830	564	623	650	597	491	501	538	547	562	373	233	171	134	109	97
A	82	49	30	45	49	96	176	133	124	120	148	175	170	149	176	162	152	140	95	108	109	101	86	105
A	67	60	21	48	41	122	167	163	109	111	174	184	148	151	168	173	148	146	123	127	102	114	98	99
A	29	23	19	20	73	242	377	412	385	443	425	403	449	504	559	616	683	643	408	250	194	153	107	76
A	69	52	76	110	110	115	168	155	176	187	154	138	142	143	139	129	138	81	74	48	38	37	39	39
A	68	59	97	93	111	110	148	212	168	206	152	135	150	144	125	132	145	97	95	53	58	67	77	60
A	62	71	76	90	112	117	138	174	177	194	147	143	160	159	141	139	130	102	88	70	71	66	69	73
A	59	48	22	31	62	201	514	734	744	617	546	569	514	451	453	532	575	595	433	299	188	143	117	100
A	68	59	23	41	85	229	558	756	830	674	685	704	742	697	731	828	790	817	788	612	632	455	238	140
A	102	64	53	45	74	127	303	492	720	792	875	849	698	715	690	627	525	715	587	390	255	249	262	162
A	58	41	44	30	27	57	51	69	70	62	66	61	45	47	42	44	38	34	38	29	34	16	20	21
A	69	46	36	33	36	89	167	135	108	116	153	201	142	131	188	161	145	124	125	102	121	97	109	83
A	32	35	16	36	69	210	336	421	452	410	404	428	470	462	523	566	656	653	405	236	179	136	120	79
A	81	53	28	34	65	151	246	414	554	592	707	706	668	682	692	671	653	584	401	255	209	161	144	122
A	39	25	25	38	48	54	74	75	52	60	63	63	53	49	35	33	38	36	34	31	25	23	21	16
A	22	18	12	20	17	21	19	13	29	26	47	35	29	33	41	32	75	57	42	43	60	76	75	61
A	61	14	22	22	57	212	525	785	753	565	559	555	493	425	445	533	537	577	410	252	187	158	120	107
A	73	49	42	31	63	97	162	145	113	104	157	200	184	152	173	153	148	144	95	98	109	118	99	100
A	84	52	25	29	48	86	158	170	141	109	156	150	130	149	146	148	125	79	101	86	96	104	92	86
A	28	24	18	20	45	88	152	131	119	145	140	168	161	164	168	171	153	123	114	111	88	107	95	85
A	20	46	20	31	88	198	359	418	433	428	434	470	478	528	570	636	717	715	428	288	178	162	115	61
A	44	24	28	35	67	196	354	436	413	492	578	612	606	675	723	781	781	816	603	383	269	221	170	129
A	32	31	30	36	81	263	375	372	426	412	429	469	454	481	532	587	700	648	402	250	187	140	122	63

A	69	70	69	79	129	116	152	170	190	173	167	167	155	151	135	132	115	106	113	71	55	76	67	60
A	58	30	22	30	54	229	511	717	763	634	563	532	520	409	456	536	610	628	454	263	170	122	134	93
A	12	11	15	6	14	18	18	18	35	30	38	36	28	53	45	42	43	52	40	43	28	27	29	19
B	395	261	190	144	86	127	187	364	441	514	531	599	701	684	757	726	732	766	785	681	539	590	679	845
B	138	75	52	54	65	104	193	352	499	490	485	547	525	630	624	679	701	808	703	616	531	497	433	294
B	144	70	60	62	72	91	241	348	542	565	539	571	603	657	701	684	755	864	821	597	586	547	463	327
B	166	82	72	54	49	108	182	314	496	497	513	573	567	602	607	644	740	788	713	489	408	412	339	224
B	138	92	54	56	55	89	201	327	519	466	502	531	629	681	718	637	704	781	730	533	424	392	393	267
B	139	76	56	51	54	79	204	333	472	477	496	583	553	571	652	635	689	799	736	665	555	559	455	286
B	176	90	74	52	73	99	211	377	506	613	547	626	622	672	751	707	795	858	901	713	587	555	627	630
B	677	319	218	182	102	93	128	212	284	404	497	657	644	727	810	827	714	772	643	515	396	362	413	297
C	288	170	107	116	190	514	1260	1559	1580	1382	1145	1222	1124	1197	1159	1162	1139	1142	1149	1083	830	690	773	680
C	261	160	105	128	188	523	1152	1593	1624	1348	1120	1176	1157	1197	1146	1217	1291	1279	1341	1108	744	754	780	742
C	557	402	343	279	230	259	321	430	556	826	947	1082	1156		1002	1015	979	1056	902	727	608	644	481	339
C	143	95	74	96	172	514	1241	1596	1621	1355	1199	1100	1167	1088	1065	1093	1268	1164	1162	1005	744	755	582	357
C	180	84	89	99	177	530	1263	1487	1665	1396	1187	1166	1063	1120	1076	1205	1208	1236	1146	965	823	811	634	437
C	522	348	256	288	209	312	667	832	1018	1244	1279	1318	1239	1245	1124	1122	1160	1167	1138	955	766	734	775	718
C	455	296	240	209	170	156	172	260	375	548	766	805	845	869	820	920	867	963	770	577	474	487	407	263
C	146	100	88	53	70	190	493	838	943	934	837	845	953	962	986	1161	1178	1219	1152	869	630	633	489	345
C	185	120	84	83	107	214	473	851	909	845	825	778	863	941	998	1161	1114	1200	1029	748	594	527	396	253
C	172	101	81	97	151	505	1219	1574	1637	1334	1147	1105	1036	1004	1066	1085	1116	1109	1135	896	692	633	489	291
C	555	368	288	274	215	352	622	882	968	1105	1170	1252	1141	1309	1294	1295	1345	1308	1265	1061	772	867	834	749
C	199	114	75	101	158	514	1203	1544	1574	1289	1122	1005	1026	1018	1075	1114	1246	1259	1113	871	714	671	500	263
C	149	93	71	101	171	515	1219	1520	1619	1319	1112	1164	1044	1085	1103	1195	1212	1238	1135	933	742	763	594	386
C	671	410	268	300	197	234	300	380	532	791	962	1119	1129	1162	984	1006	1104	1047	958	682	641	676	503	285
C	177	103	76	57	98	194	499	870	988	922	833	843	868	876	1002	1086	1168	1154	985	672	502	494	366	269
C	244	172	120	87	93	215	521	841	975	963	819	893	937	956	1101	1171	1196	1254	1097	895	618	578	516	566
C	379	281	241	211	170	162	325	479	761	1006	1074	1098	1099	1162	1118	1032	942	931	879	780	571	529	816	717
C	154	87	80	54	96	200	494	868	991	930	826	881	889	978	997	1091	1186	1211	1165	851	635	658	495	368
C	236	155	117	77	78	210	512	817	927	876	846	876	964	951	1108	1127	1099	1208	1112	847	643	745	734	580

C	431	251	264	184	186	156	290	429	703	906	961	1029	1062	1008	1064	1048	993	977	984	790	560	517	586	543
C	485	321	259	211	157	146	145	275	375	553	709	835	876	828	839	853	970	897	786	614	493	519	381	261
C	257	127	101	98	179	556	1241	1554	1642	1351	1151	1174	1185	1090	1099	1154	1241	1289	1191	1064	898	872	691	491
C	630	417	313	299	201	232	314	424	521	804	871	1088	1051	1130	1048	1170	1201	1081	980	710	683	691	454	313
C	212	110	78	99	195	522	1137	1538	1672	1338	1196	1069	1108	1132	1075	1143	1147	1361	1140	1003	804	818	727	481
C	266	134	105	107	164	525	1242	1527	1630	1340	1117	1232	1101	1168	1140	1143	1210	1125	1214	1108	779	838	763	481
C	122	92	61	62	71	180	489	832	953	906	851	885	880	877	983	1054	960	1190	1106	861	648	656	440	298
C	218	132	99	61	75	179	507	833	910	970	850	878	946	1002	1092	1117	1221	1203	1145	900	670	688	558	395
C	518	342	376	220	182	155	177	299	378	608	753	820	877	888	848	867	875	871	810	838	543	509	381	259
C	159	80	56	66	72	176	512	853	1019	889	786	815	963	946	1049	1115	1139	1176	1113	782	647	587	487	334
C	210	128	84	54	67	207	488	851	1021	877	802	902	961	952	1026	1100	1127	1222	1208	874	660	623	535	412

Table 1 – Extracted data for station A, B, and C



Graph 1 – Graph to Visualise Tabled Data of 3 Stations