CSE587 Data Intensive Computing

Project 2: Part 3

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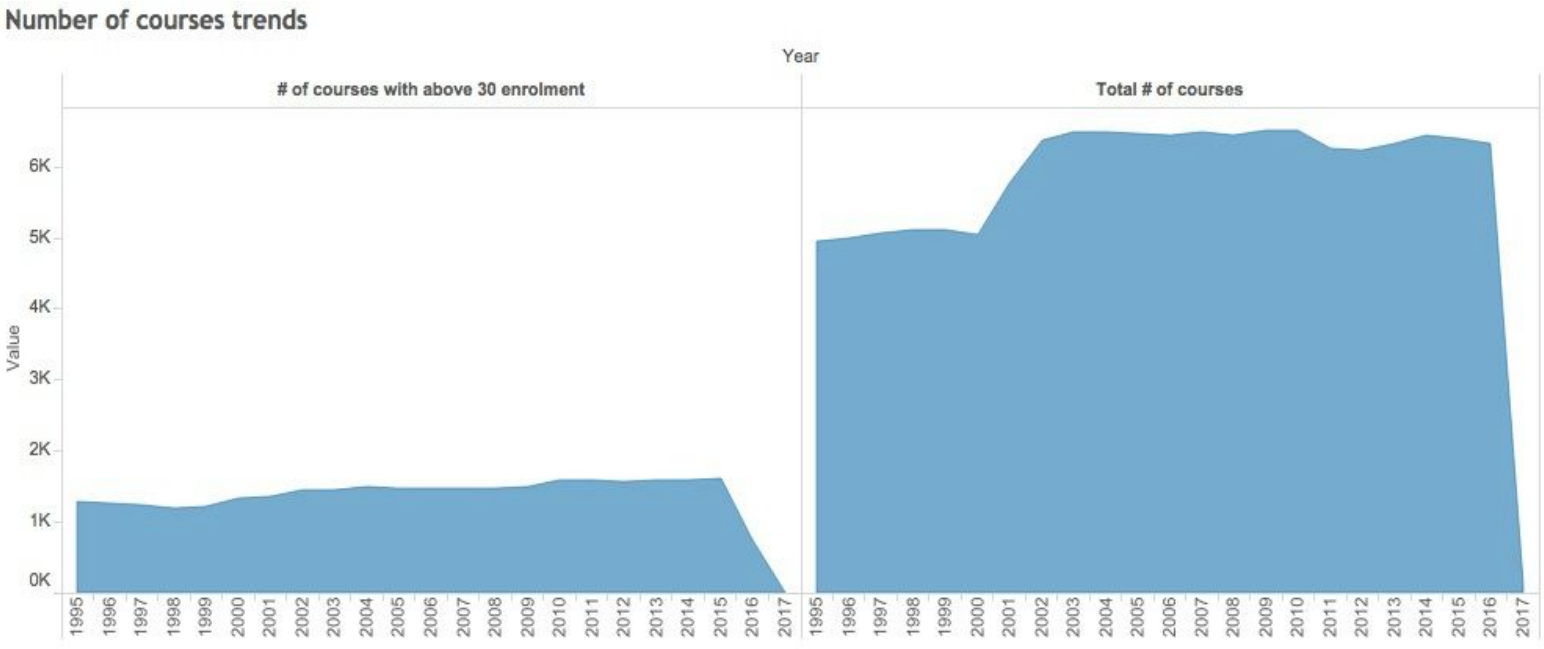
Story: Class Schedule Analysis

We are analysing class schedule data of UB over the years having room allotment of various courses. In this data we are looking into trends of enrolment in courses and departments, room utilization, prediction of future enrolment etc.

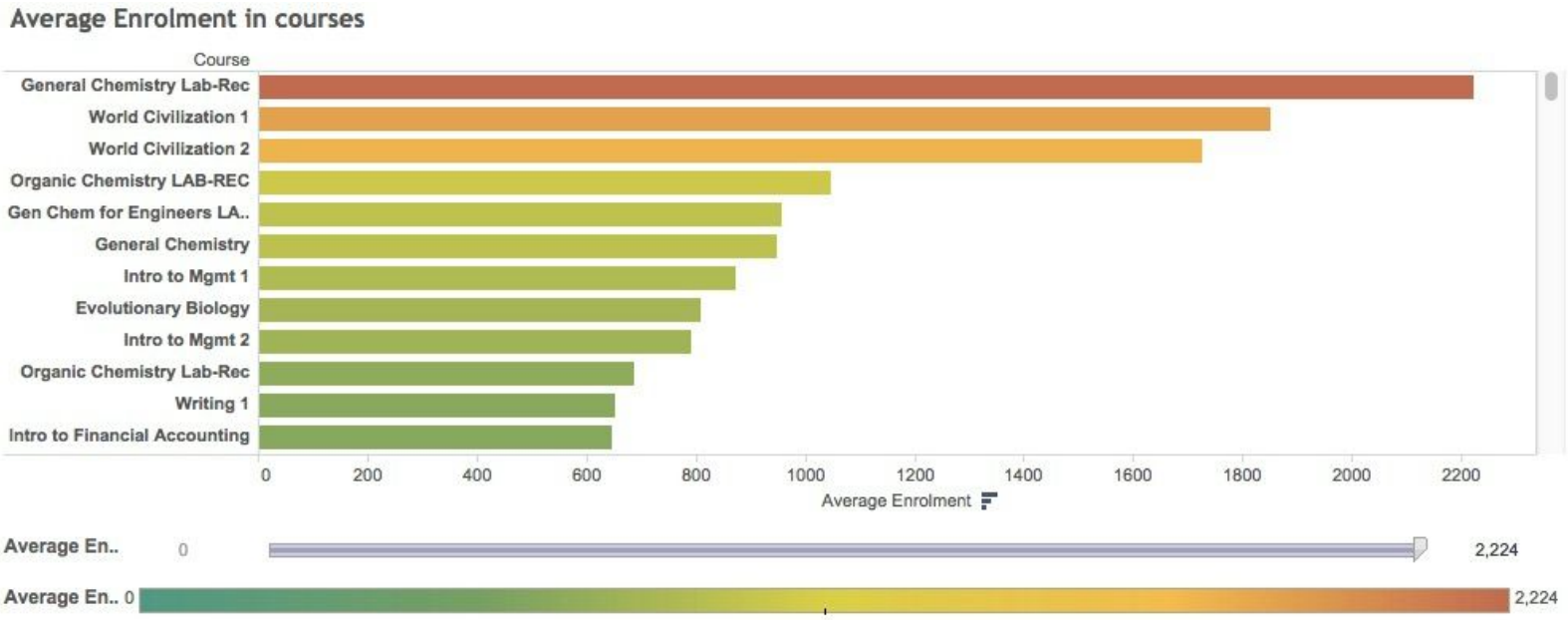
Point 1: Number of courses trends

Class scheduling problem very much include the trend of number of courses and especially courses requiring bigger rooms. Here we used the MR output separating the total courses and courses having enrolment higher than 30 and plotted a visualization showing its trend.



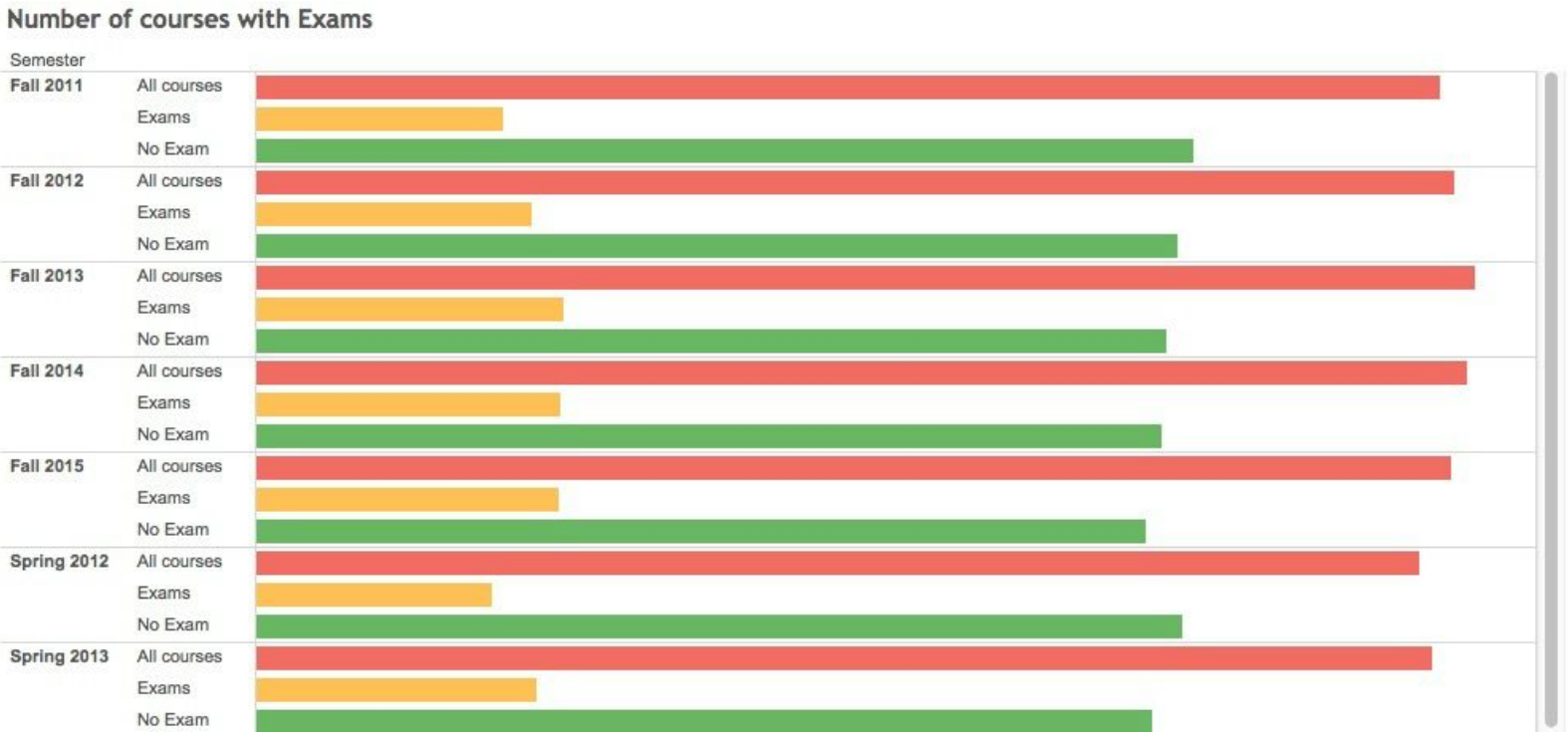
Since the number of courses are steady we can easily allot rooms for future semesters.

Not only the trend of number of courses, we also need the courses which are very popular among students and have large amount of enrolment. We plotted the courses in decreasing number of their average enrolment. The filter below can be used to lower the average enrolment to view courses according to their enrolment and therefore, can allot rooms accordingly.



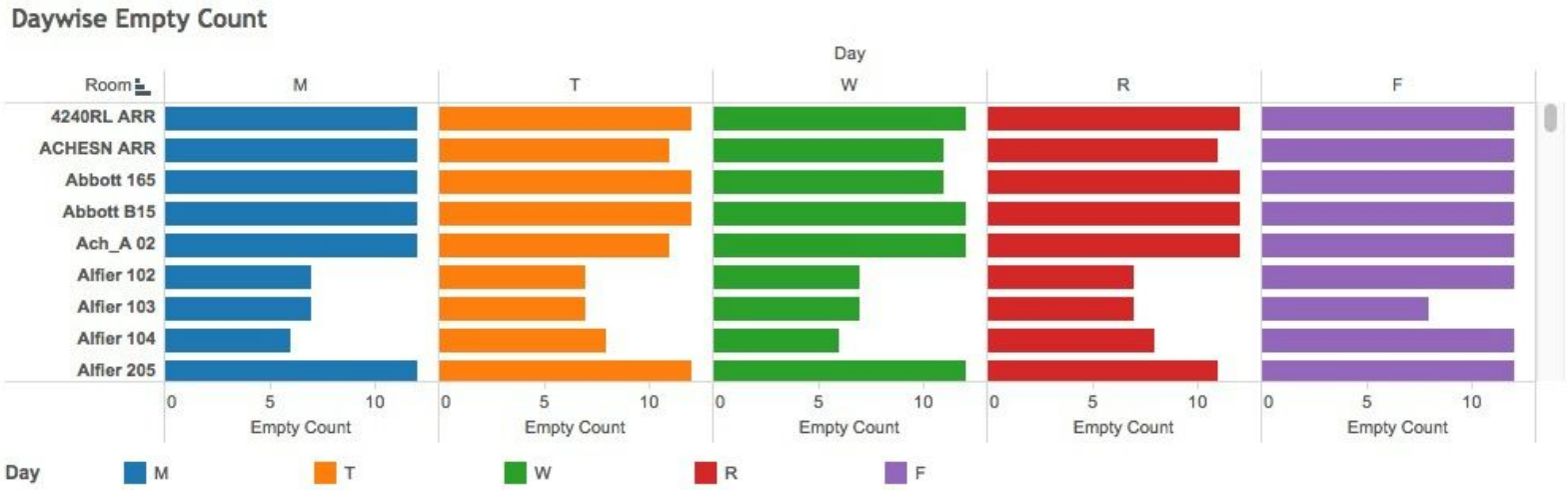
Point 2: Number of courses and exam trend

Room allotment not only include scheduling classes but also their exams and beforehand knowing the number of exams there are going to be will be a help. Therefore, we looked into the number of courses which have exams plotted its trend. We can compare this with point 1 plots and know the room size required.

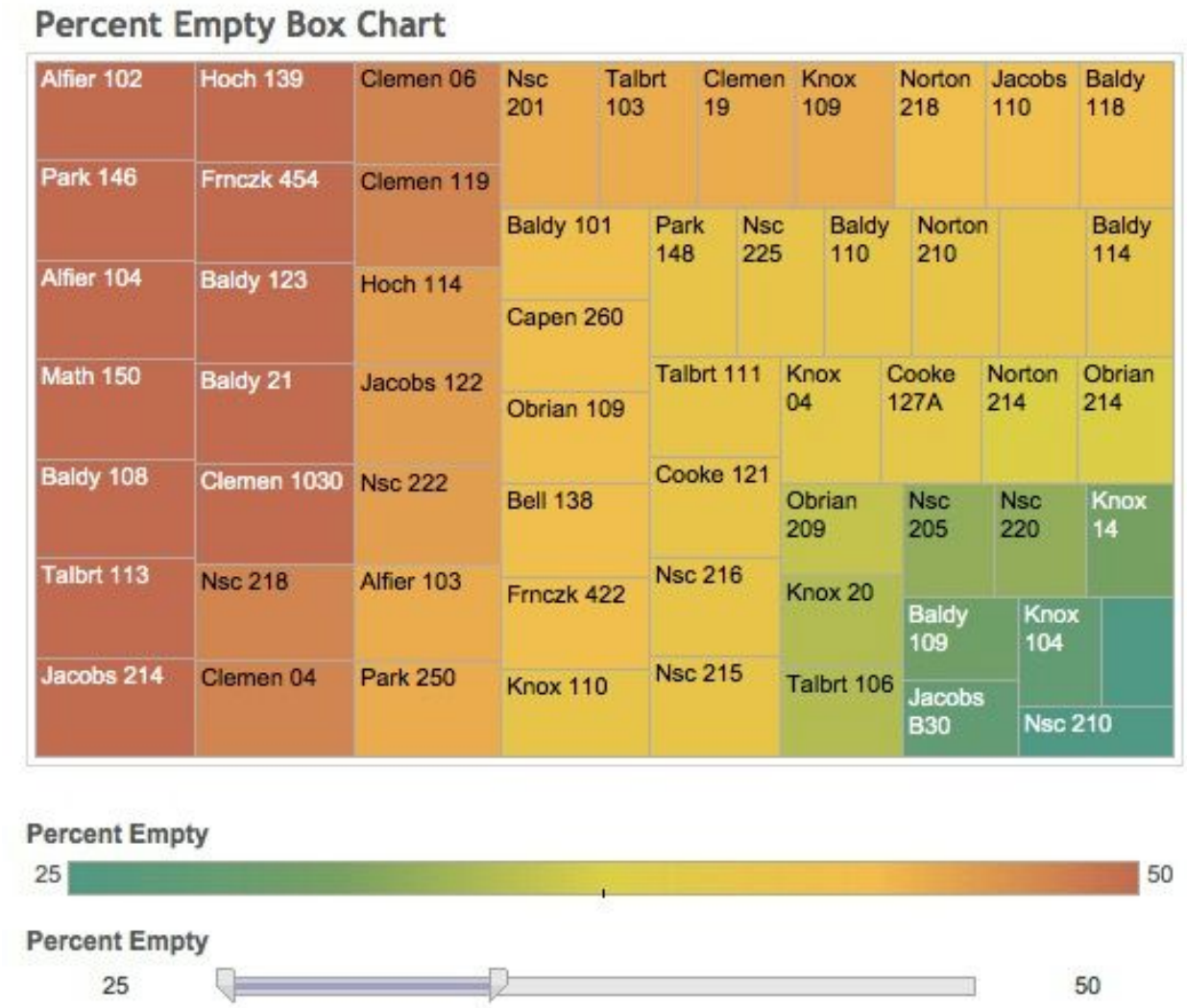


Point 3: Room Utilization

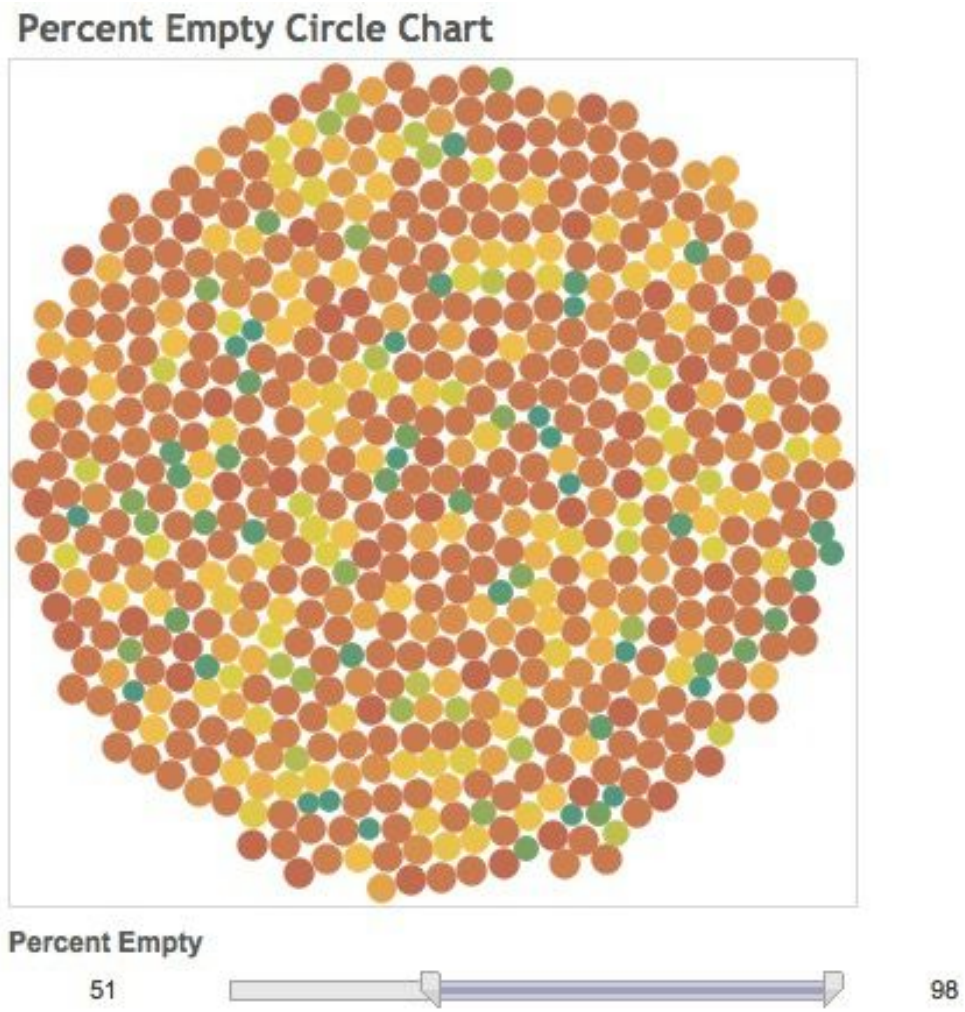
From a total of 12 hours of daily classes and 60 hours weekly, we have looked into the number of hours every room is empty. From these plots we can know how much each room is being empty and can be utilized for other activities or some new courses in the future.



Also, we can plan for increasing the number of courses in the future. Here we have shown the percent of time room is empty in the week.



In the above plot we show all the rooms which are empty below 50% of the time, though we can increase the percent empty range. We can see from the plot that NSC 210 is the least empty room.



In the above plot we can see the rooms which are empty above 50% of the time. A large number of circles denote many rooms being under-utilized.

Point 4: Enrolment Prediction

To successfully implement class schedule and room allotment we need to know the prediction of enrolment from the current trend. For this we used linear regression in MR and used its output to predict future enrolments.

Average Enrolment Department wise

Department

Year	AAP	AAS	AHI	AMS	ANA	ANE	AP	APY	ARC	ARI	ART	AS	ASE	ASI	ASL
2006	41	751	1,833	825	1,750	30	96	2,154	3,859	97	2,706	195	0	66	282
2007	114	808	1,598	683	1,280	22	62	2,359	4,235	110	2,057	149		79	300
2008	136	659	1,693	671	1,581	19	62	2,216	4,117	101	2,170	109		35	297
2009	130	737	1,609	583	1,805	33	71	2,412	3,846	119	2,018	162		0	293
2010	139	672	1,705	711	1,886	43	57	2,606	3,498	91	1,926	167		1	342
2011	182	638	1,620	670	2,550	23	80	2,491	3,329	87	1,880	175			348
2012	176	699	1,407	543	3,188	47	52	2,175	3,524	112	1,728	166		1	413
2013	149	732	1,078	620	3,306	27	85	2,101	3,857	129	1,664	105		5	454
2014	136	570	1,319	569	3,179	45	60	1,962	4,070	121	1,664	111			442
2015	142	617	1,398	345	3,084	43	54	1,743	4,012	105	1,573	227			438

Enrolment

0 — 21,070

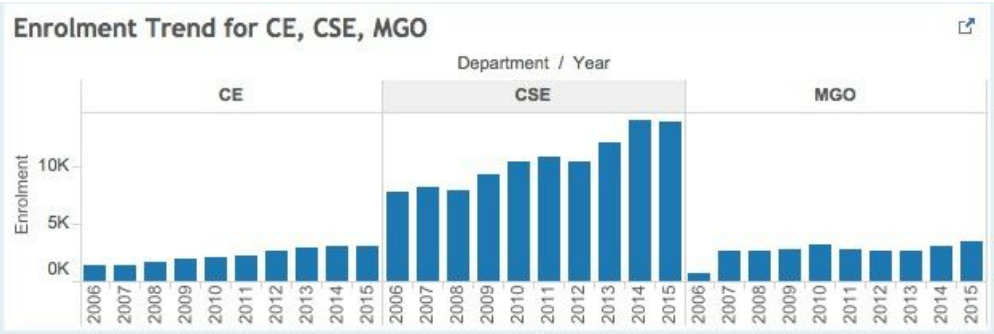
Predicted Enrolment

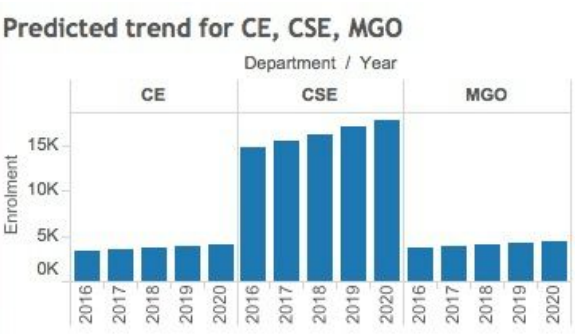
Department

Year	AAP	AAS	AHI	AMS	ANA	ANE	AP	APY	ARC	ARI	ART	AS	ASL	ATH	BCH
2016	143	601	1,369	283	3,244	45	50	1,636	4,051	104	1,491	242	455	6,400	687
2017	145	585	1,341	221	3,405	47	47	1,530	4,090	104	1,410	258	472	6,781	658
2018	147	569	1,312	160	3,566	49	44	1,423	4,130	103	1,329	273	489	7,162	629
2019	148	553	1,284	98	3,726	51	41	1,317	4,169	103	1,248	289	506	7,543	600
2020	150	537	1,255	37	3,887	53	38	1,210	4,209	102	1,166	305	523	7,924	572

Enrolment -4,526 — 24,016

We have also shown the prediction trend of a few of the departments.





Individual Contribution

All the discussion and decisions are taken by both the team members. The implementation is done on a single machine as there was problem in signing up of one of the team member.

- Tableau Desktop and Server setup by Priyanka Singh.
- Two dashboards by Sahil Dureja and two by Priyanka Singh.
- Uploading, user settings and testing the server by Sahil Dureja.
- Report by Priyanka Singh.

Link to the project:

https://10az.online.tableau.com/#/site/sahildurpsingh28/projects/35299/workbooks