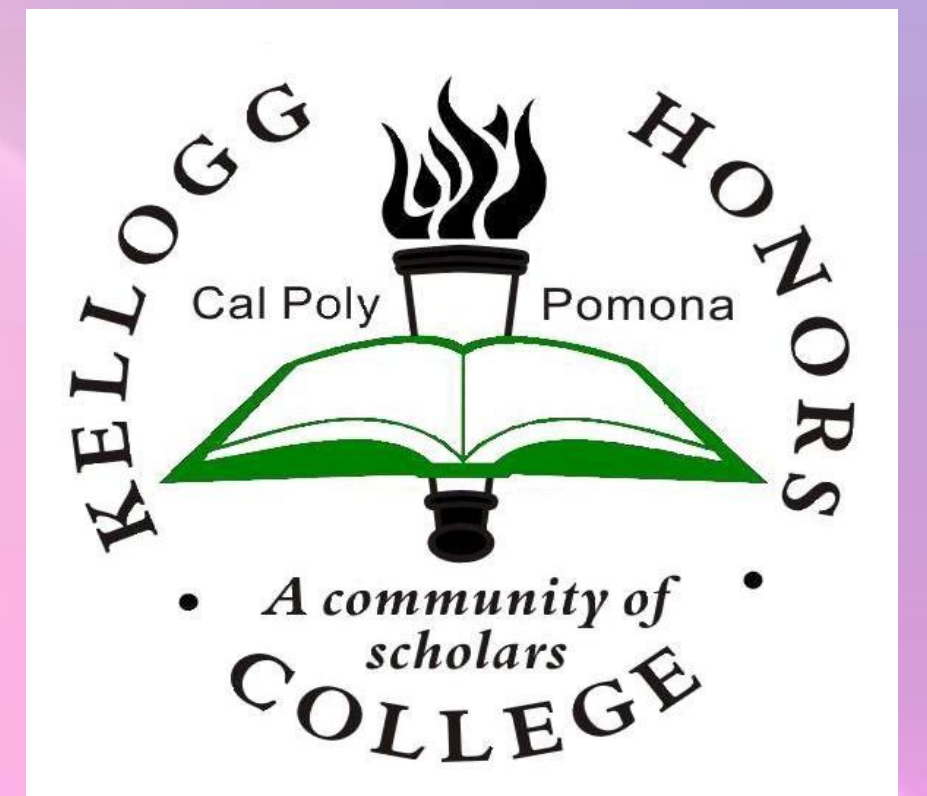
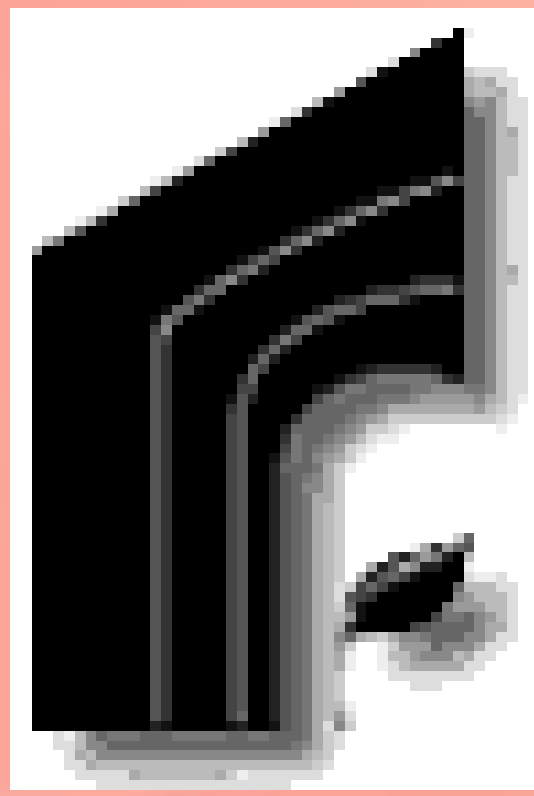


# Using Tableau as a means for Big Data Analytics: As Demonstrated by Cal Poly Pomona Class Enrollment Data

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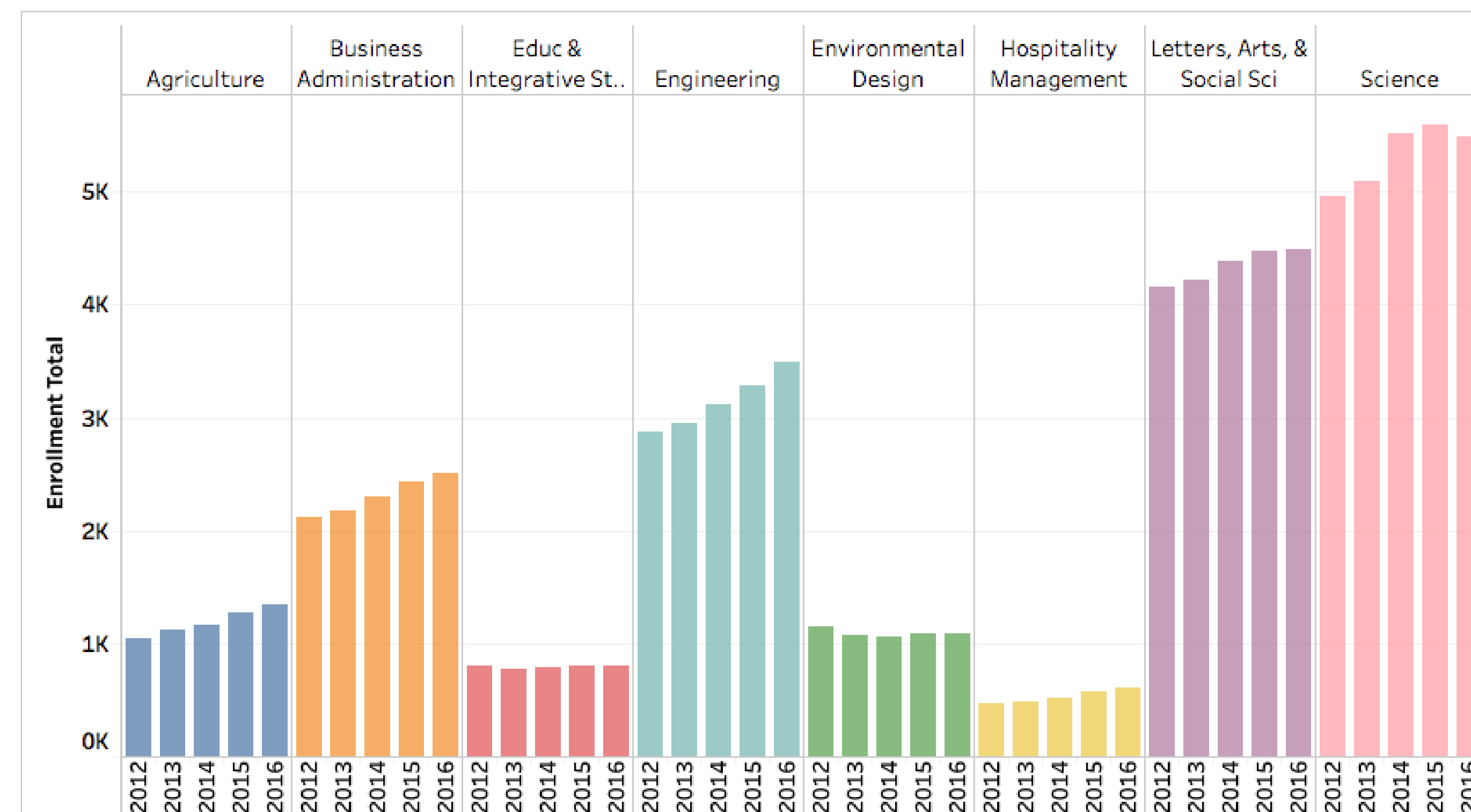


## Abstract

Big data analytics is an essential component of fact-based managerial decision-making. The growth of technology has resulted in availability of large amounts of data that can be used by managers to make more objective and better decisions. Over the past two years, teams of Cal Poly Pomona students in the Technology and Operation Management department, under Boeing Corporation sponsorship, have engaged in a data analytic project to examine five million lines of data, spanning a five-year period. The goal of the project is to identify spending trends over time, quantify patterns, and develop future spending predictions. The team utilized Tableau software to analyze the data; in a similar way, this study of student class enrollment will use the same software to analyze 55,000 records of Cal Poly Pomona's data from over the past five years. This report provides a descriptive analysis of student course demand, identifies which classes act as bottlenecks, and shows the relationship between student demand and the need for student services, such as parking, number of classes, and other important university managerial issues.

## Graphs and Interpretations

Enrollment by College (2012-2016)



Over the last five years, most of the colleges at Cal Poly have shown an increase in class enrollment numbers. The most significant of these is in the College of Agriculture, which had a growth of 30% from 2012 to 2016, closely followed by Hospitality Management at 28%.

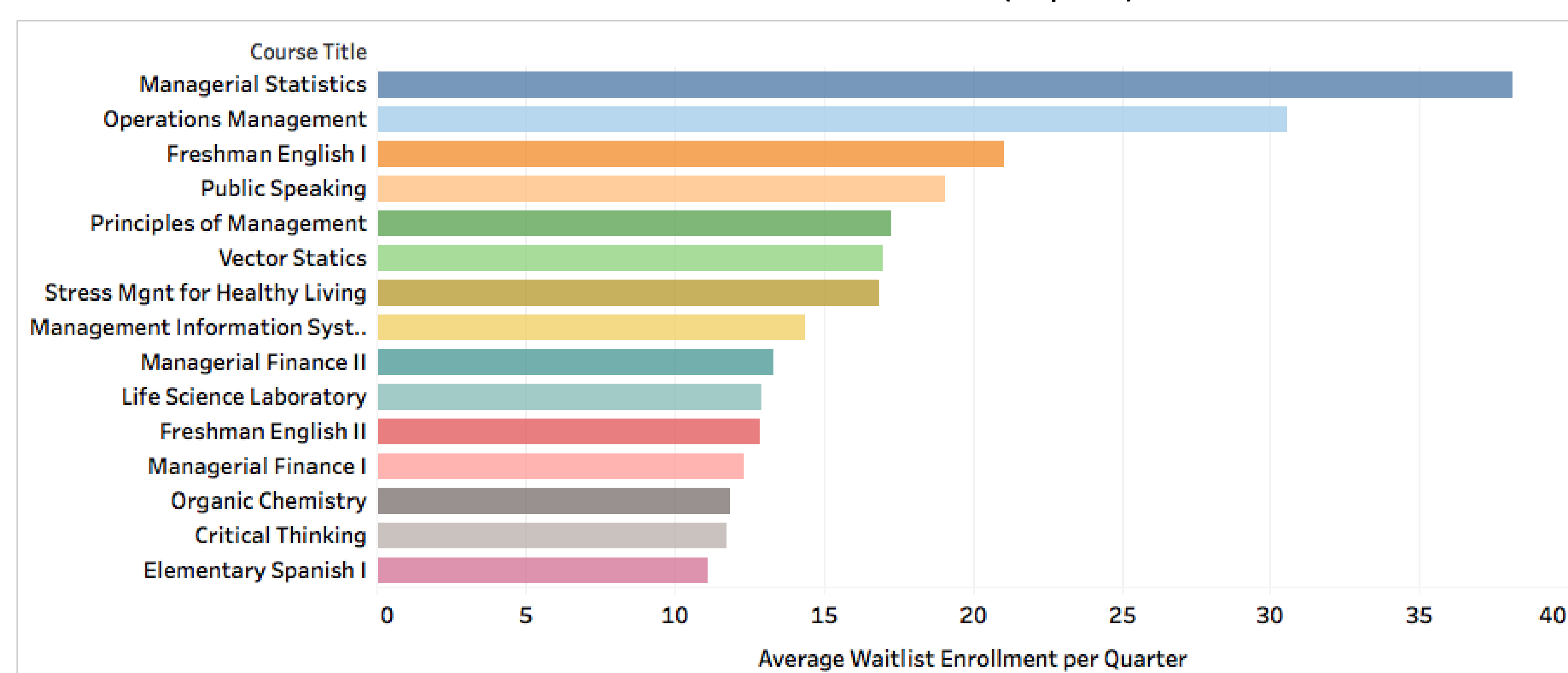
## What is Big Data Analytics?

- An analysis of large amounts of data to explore patterns and correlations
- Essential for making informed business decisions
- Necessary for the improvement and optimization of business processes

## Benefits of Tableau Software

- Has practical application in professional settings
- Increasingly more popular in large corporations
- Capable of analyzing millions of data records
- Provides a platform to make engaging visual aids to display findings

Course Waitlist Totals (top 15)

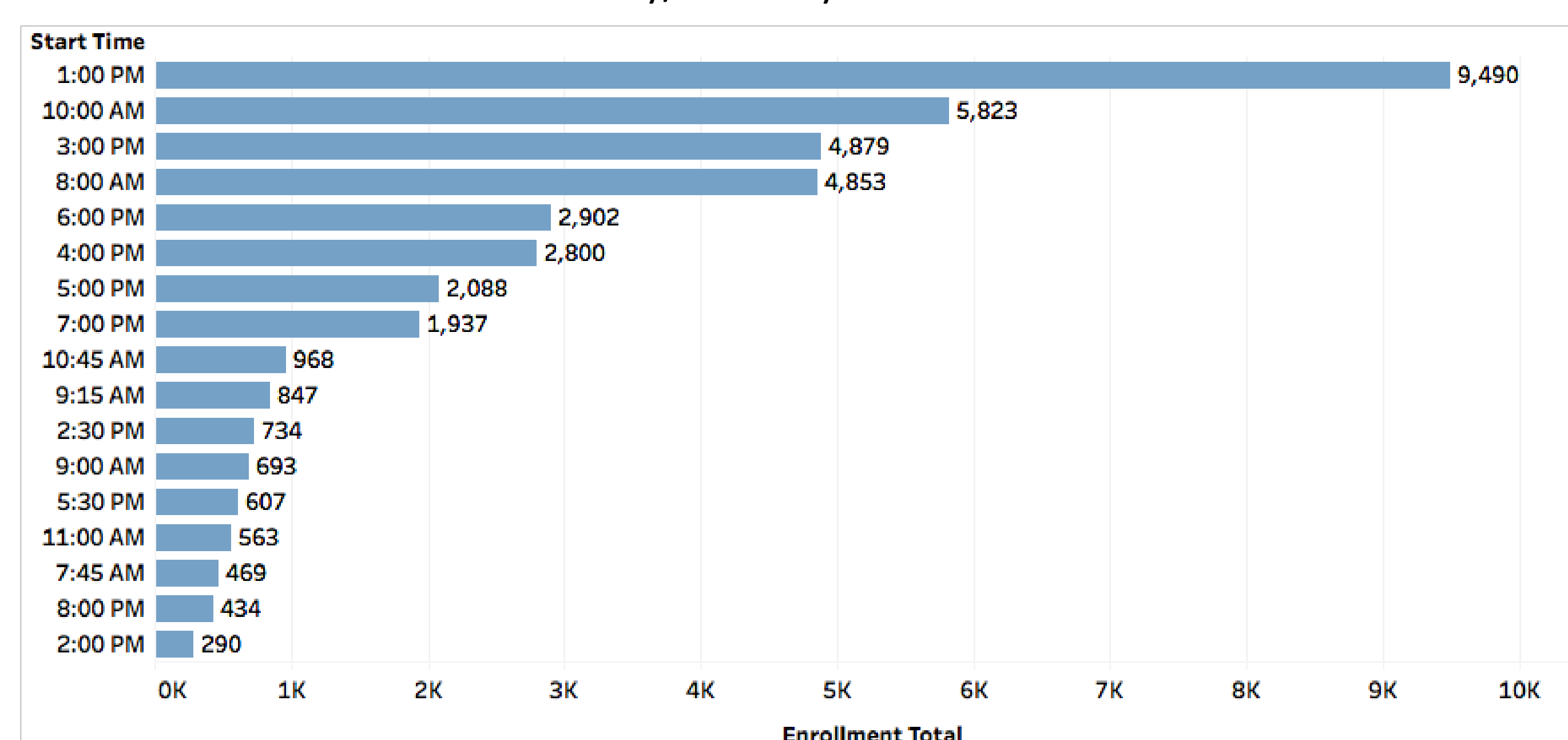


This graph identifies the top 15 courses with the highest number of students on the waitlist. The two highest are both TOM classes within the College of Business. As they are both requirements for all business majors, they currently may act as a bottleneck and inhibit student graduation progress.

## Conclusions

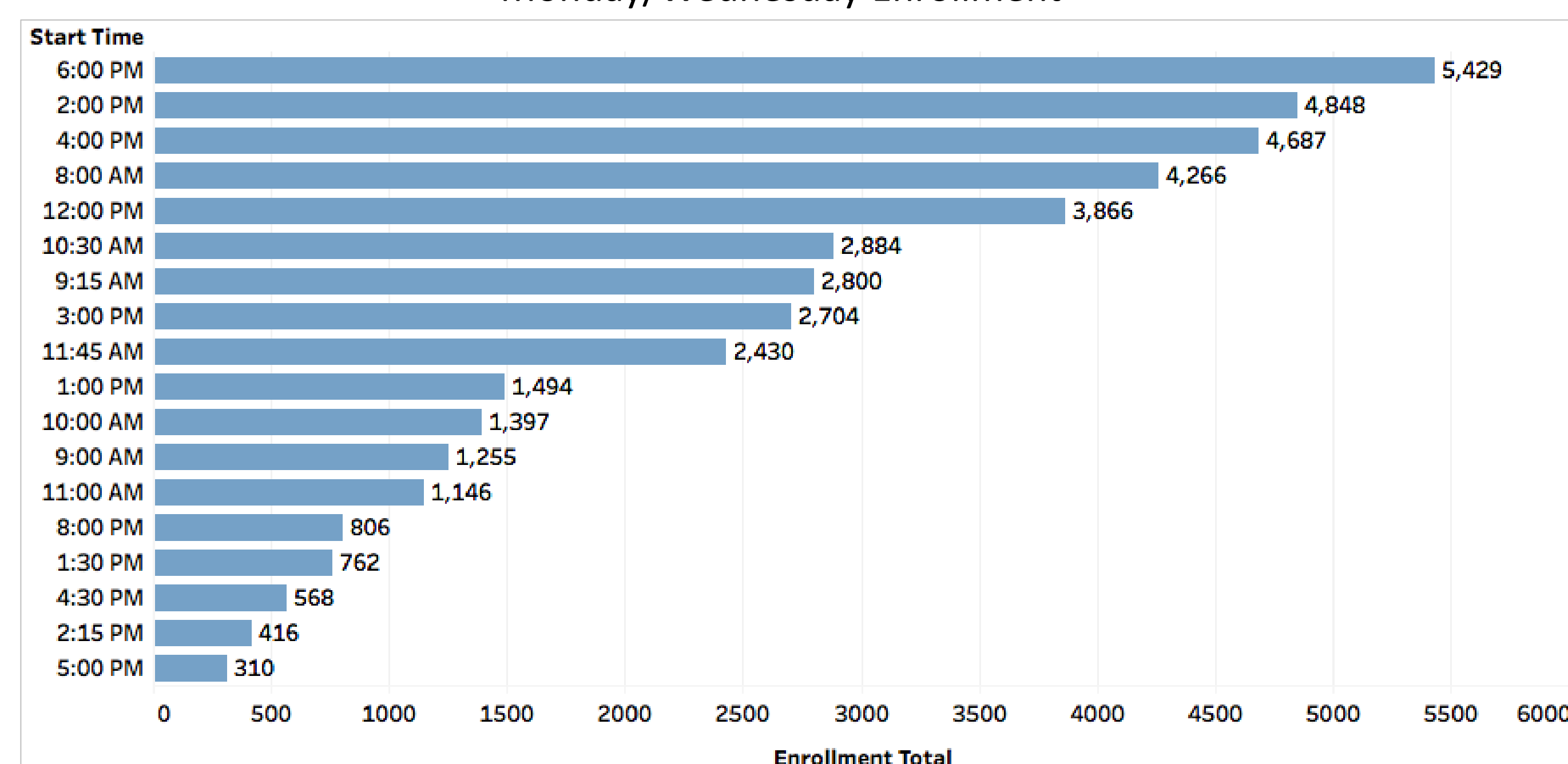
Utilizing the skills I learned on the Boeing project team, I used Tableau to analyze Cal Poly Pomona enrollment data. The first area of analysis is of course enrollment numbers by college. The University has seen growth in class enrollment in every college over the past five years. Notably, the greatest growth in class enrollment has been in the Colleges of Agriculture and Hospitality Management. To meet this increase in student demand, more courses are now being offered. While the greatest growth has been in the aforementioned colleges, the two with the highest total class enrollment are the College of Letters, Arts, and Social Sciences, and the College of Science. A potential factor in these high numbers would be that all students in all majors must take courses from these colleges in order to fulfill their general education requirements. The second area of analysis is of courses with high waitlist enrollment. From this data we are able to view the top 15 waitlisted courses. While there were slight variances in the order of these courses over the years, in general, the top 15 remained the same. These courses appear to act as bottlenecks which inhibit student enrollment. In particular, the top two courses, Managerial Statistics and Operations Management, regularly have 40-50% more students on the waitlist, compared to other courses with waitlists. Based upon these numbers, I suggest that additional sections of these courses be offered in order to help eliminate the bottleneck-effect that occurs due to limited course offerings, and to allow for students to graduate in a timely manner. The final area of analysis considers, the uneven scheduling of courses, which may cause a variety of student demand issues. Tuesday and Thursday class enrollment at 1 pm is approximately 40% greater than the highest enrollment time on Monday and Wednesdays. This uneven distribution of class offerings/enrollment by time of day results in a correspondingly uneven demand for on-campus services, amenities, and facility utilization. Therefore, the university should strive to schedule classes more evenly by day of the week, and time of the day in order to balance the demands of students.

Tuesday/Thursday Enrollment



Enrollment on Tuesday and Thursdays at 1pm is 9,490 students, which is 39% greater than the next most popular time (10am). This significant jump suggests an uneven scheduling distribution of classes.

Monday/Wednesday Enrollment



Monday and Wednesday enrollment is more evenly distributed than Tuesday and Thursday, but its peak (5,429 students) is nearly half of that of the Tuesday/Thursday peak (9,490 students).