
NYC Statistics: A Tale of Two Cities

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This Statistics course is thought to be a course "themed" with New York City. All in-class and out-of-classroom activities are designed to include current NYC data related to urban issues like changes in city demographics, income and housing inequalities, NYPD practices and tactics in the city to reduce crime and increase streets security, analysis of impacts and adaptation to climate change, among others.

Module 1: My class, my neighborhood, my city

As an introduction to the defining components of Statistics and its practice students presented with the question: *How could we describe a group of people?* In this project, students design a sample framework to collect data for variables like country of origin, age, gender, and NYC borough of residence, and attempt to generate a report on their observational study. Through this experiential-based assignment, students learn through practice the key issues on sampling techniques and bias, sample and population data, concluding with a demographic comparative study of neighborhoods, the college, and the city. In this study, students are prompted to critically reflect on the implications of the differences at several geographical scales. Figure 1 shows demographic data collected in Fall 2014 by students of a pilot group at LaGuardia Community College.

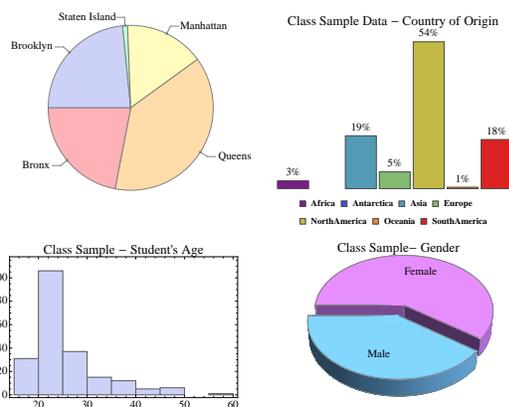


Figure 1: Elementary Statistics students collected data for a pilot study to design and refine modules 1's activities using the SENCER model. Students collected data on four variables: country of origin, gender, age, and NYC borough of residence, individual student data was collected for the whole class to be compared with LaGuardia institutional profile and NYC data.

Module 2: What can we learn about NYC from where we live and work?

Based in the demographic study completed in module 1, students explore and learn how to identify linear correlations between two data sets using scatterplots and the linear correlation coefficient. In addition, learn how to identify causation and its limits when analyzing real data.

Module 3: The old and new New Yorkers, and their environment

Fundamentals concepts of probability are presented to students through two-way tables compiled from the Census 2010 and NYC agencies reporting on the latest numbers of neighborhood composition changes over time, sustainable practices in the city, and the quality of air and water effects on the health of NYC residents. In addition, Stop&Frisk data is introduced to reflect on the key issues of this controversial practice.

Module 4: Inferential Statistics from NYC Data The course concludes with this module, where students revisit the data analyzed in the course to learn about the estimation of statistics that represent the population of NYC, estimate confidence intervals, and learn the fundamentals of hypothesis testing.

The modules being developed by the LaGuardia Community College team, in the context of the Engaging Mathematics project, are tailored for students who require to complete a standard Elementary Statistics course as part of their major or as part of an elective math course sequence. The modules are designed to be portable units that could be implemented within the standard curriculum as in-class activities, in-class group work, or group research projects. The course will provide students with an opportunity to learn statistics by describing how it can be applied to social, civic, and environmental issues.