

# Geographic Distribution of Williams College Student Body from 2010-2015

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## Introduction

The **geodist** package examines changes in the geographic distribution of the Williams College student body from 2010-2011 to 2015-2016 academic years. This package specifically answers the following three questions: How does the international student body change from 2010 to 2015? Which states consistently produce the highest number of Williams College students from 2010 to 2015? Which countries consistently produce the highest number of Williams College students from 2010 to 2015? Given that geographic diversity plays a role in admissions decisions as well as the overall identity of the Williams College student body, examining the trends in diverse student enrollment is important to ultimately evaluating the effectiveness of the Williams College Admissions Departments' domestic and international outreach efforts.

## Dependencies & Code

For the **geodist.R** file, there are not any external packages or libraries required to run the code. For the report, the **knitr** package was used to both generate the pdf and present the sample tables nicely. In order to run the geodist.R file, move the **geodist** package to your desktop and run the geodist.R file since the directory paths within the file are already configured to find the dependent .csv files from the desktop.

## Data

This package analyzes data provided by the Office of the Registrar of Williams College. The PDF catalog documents compiled by the registrar were converted to text files by an online pdf-to-text converter and the appropriate data for the student body were further truncated. The data were then converted to .csv files.

For each year, the data were split into two tables: a table for international students and a table for domestic students. The .csv files, which are labeled by "year" and either "intl" or "dom," are loaded in a block of code seen below.

```
library(knitr)
# Load the .csv files
dom2015yr <- read.table("~/Desktop/geodist/csvs/2015dom.csv", header=T, sep=",")
intl2015yr <- read.table("~/Desktop/geodist/csvs/2015intl.csv", header=T, sep=",")

# Convert to Data Frames
intl2015df <- data.frame(intl2015yr)
dom2015df <- data.frame(dom2015yr)

# Reorder Data Frames
orddom2015 <- orderbystudents(dom2015df)
ordintl2015 <- orderbystudents(intl2015df)

# Calculate Perc. of Int'l students
intlsum2015 <- sumofstudents(ordintl2015)
intlperc2015 <- approxperc(intlsum2015)
```

The following are sample results. The first value is an approximate percentage (with the total student body estimated at ~2200) of international students at Williams College during the 2015-2016 academic year. The second table shows the top 10 states with highest student representation among the Williams College student body. The third table shows the top 10 foreign countries with the highest student representation.

```
# Percentage of Int'l Students, Top States
intlperc2015
```

```
## [1] 9.227273
```

```
# Top 10 Represented States among Williams students in 2015-16
```

```
ordkabdom2015 <- kable(orddom2015[1:10,], caption = "2015-2016 Academic Year - Domestic")
ordkabdom2015
```

Table 1: 2015-2016 Academic Year - Domestic

	State	Students
33	New York	413
23	Massachusetts	280
6	California	267
31	New Jersey	127
8	Connecticut	120
11	Florida	83
39	Pennsylvania	72
15	Illinois	67
22	Maryland	64
44	Texas	62

```
# Top 10 Represented Countries among Williams students in 2015-16
```

```
ordkabintl2015 <- kable(ordintl2015[1:10,], caption = "2015-2016 Academic Year - International")
ordkabintl2015
```

Table 2: 2015-2016 Academic Year - International

	Country	Students
12	Canada	20
14	China	19
32	Republic of Korea	15
62	United Kingdom	9
26	Hong Kong	7
65	Viet Nam	6
20	France	5
27	India	5
31	Kenya	5
45	Philippines	5

## Results & Analysis

The resulting data are organized at the end of the document in table form. Unfortunately, I couldn't quite figure out how to line the tables up nicely together without compromising format quality, so I put them at the end as to maintain continuity throughout the paper. Altogether, this package aims to answer three questions about Williams College undergraduates' geographic distribution from the years 2010-11 to 2015-16.

**Question 1 : How does the international student body change from 2010 to 2015?** As shown in Table 3, between 2010 and 2015, the percentage of the Williams student body that hails from foreign countries has declined from ~**10.7%** to ~**9.2%**. This result is interesting as, despite efforts to improve college diversity across nationwide campuses, Williams experienced a slight decline in international students. However, one assumption in the data was that the student body would remain approximately 2,200 every year, and doesn't take into account years with slightly smaller student bodies. As a result, the above percentages at worst are a slight underestimate.

**Question 2 : Which states consistently produce the highest number of Williams College students from 2010 to 2015?** Tables 4-9 show the Top 10 most represented states at Williams over the aforementioned years. The five states with consistently the highest representation at Williams are **New York** (1st all six years), **Massachusetts** (2nd all six years), **California** (3rd all six years), **Connecticut** and **New Jersey** (which alternate 4th and 5th occasionally). Furthermore, the next five most represented states, **Illinois**, **Texas**, **Florida**, **Maryland**, and **Pennsylvania**, consistently fill the spots 6-10 among the most represented states from 2010 to 2015.

An interesting place for further examination is the trend in the tailing states of this group. As a potential future project, it would be useful to analyze how the bottom 10 states change in their representation as this information could further inform the Williams College admissions office on its marketing efforts throughout underrepresented states.

**Question 3 : Which countries consistently produce the highest number of Williams College students from 2010 to 2015?** Tables 10-15 show the Top 10 most represented countries at Williams. As we can observe, the three most highly represented countries at Williams are **Canada**, **China (People's Republic of)**, and **Republic of Korea**. These countries alternate positions for top three slots, with Canada holding 1st for the last four years. Outside of these three countries, **Kenya**, **United Kingdom**, **Nepal**, and **Vietnam** have had consistent representation among top 10 most represented countries over the last six years.

## Further Investigation

This paper and package only touch upon the myriad implications of understanding trends in geographic representation among Williams College students. How has geographic representation changed over a longer timeframe? Additionally, how does representation from nations and states with previously few Williams students evolve over the years? Furthermore, how do other aspects of a particular region such as political climate, overall economic health, consumer price index, foreign currency exchange rate, and social norms affect changes in student representation? A continual investigation of from where Williams College students hail would be beneficial to the College as it evaluates its efforts to attract more students of different backgrounds.

## Appendix of Data

The first result is a table with the approx. percentage of Williams College students who are international.

Table 3: Approx. Percentage of Int'l Students

2010-2011	10.727273
2011-2012	10.545454
2012-2013	10.181818
2013-2014	9.727273
2014-2015	9.318182
2015-2016	9.227273

The top 10 represented states among Williams students from 2010-2011 to 2015-2016 academic years are shown in the tables below.

Table 4: 2010-2011 Academic Year - Domestic

	State	Students
33	New York	406
23	Massachusetts	292
6	California	235
8	Connecticut	133
31	New Jersey	129
16	Illinois	73
45	Texas	57
22	Maryland	56
39	Pennsylvania	54
11	Florida	51

Table 5: 2011-2012 Academic Year - Domestic

	States	Students
32	New York	403
22	Massachusetts	305
5	California	239
7	Connecticut	135
30	New Jersey	127
15	Illinois	74
21	Maryland	57
38	Pennsylvania	55
44	Texas	55
10	Florida	52

Table 6: 2012-2013 Academic Year - Domestic

	States	Students
32	New York	402
22	Massachusetts	293
5	California	237
30	New Jersey	131
7	Connecticut	126
15	Illinois	73
10	Florida	60
38	Pennsylvania	58
44	Texas	55
21	Maryland	52

Table 7: 2013-2014 Academic Year - Domestic

	State	Students
32	New York	393
22	Massachusetts	307
5	California	240
30	New Jersey	127

	State	Students
7	Connecticut	117
15	Illinois	80
10	Florida	66
38	Pennsylvania	59
21	Maryland	57
43	Texas	57

Table 8: 2014-2015 Academic Year - Domestic

	State	Students
33	New York	393
23	Massachusetts	291
5	California	264
31	New Jersey	124
7	Connecticut	107
15	Illinois	86
39	Pennsylvania	74
10	Florida	72
44	Texas	64
22	Maryland	61

Table 9: 2015-2016 Academic Year - Domestic

	State	Students
33	New York	413
23	Massachusetts	280
6	California	267
31	New Jersey	127
8	Connecticut	120
11	Florida	83
39	Pennsylvania	72
15	Illinois	67
22	Maryland	64
44	Texas	62

And finally, below are the top 10 represented countries among Williams students from 2010-2011 to 2015-2016.

Table 10: 2010-2011 Academic Year - International

	Country	Students
17	China	25
16	Canada	20
37	Republic of Korea	16
49	Nepal	10
77	Viet Nam	9
51	Pakistan	8
29	Hong Kong	7
36	Kenya	7

	Country	Students
74	United Kingdom	7
11	Botswana	6

Table 11: 2011-2012 Academic Year - International

	Country	Students
16	China	24
15	Canada	20
36	Republic of Korea	17
48	Nepal	10
50	Pakistan	9
76	Viet Nam	9
10	Botswana	6
28	Hong Kong	6
35	Kenya	6
73	United Kingdom	6

Table 12: 2012-2013 Academic Year - International

	Country	Students
17	Canada	20
39	Republic of Korea	19
18	China	15
52	Nepal	11
13	Botswana	8
38	Kenya	7
76	United Kingdom	7
23	France	6
31	Hong Kong	6
79	Viet Nam	6

Table 13: 2013-2014 Academic Year - International

	Country	Students
15	Canada	19
16	China	19
35	Korea, Republic of	17
10	Botswana	7
34	Kenya	7
46	Nepal	7
27	Hong Kong	6
20	France	5
29	India	5
33	Jordan	5

Table 14: 2014-2015 Academic Year - International

	Country	Students
15	Canada	22
39	Korea, Republic of	22
17	China	16
38	Kenya	7
31	Hong Kong	6
32	India	6
10	Botswana	5
77	Zimbabwe	5
6	Bangladesh	4
24	France	4

Table 15: 2015-2016 Academic Year - International

	Country	Students
12	Canada	20
14	China	19
32	Republic of Korea	15
62	United Kingdom	9
26	Hong Kong	7
65	Viet Nam	6
20	France	5
27	India	5
31	Kenya	5
45	Philippines	5