Williams College Graduates

by Ben Czekanski

Abstract This package cleans and examines data found in Williams College Course Catalogs about graduating seniors from 2000-2016. The data in this package includes the names, graduation years and predicted genders of graduates, as well as information about latin and departmental honors. In addition to the data **wcgrads** provides examples of interesting analyses of the data as examples for users.

Introduction

The package **wcgrads** examines data on graduating seniors from 2000 to 2016 published in the Williams College Course Catalog. The Catalog is published as a PDF document, so this package converts catalog from .pdf to .txt and then cleans it into a tidy format for analysis. **wcgrads** includes analyses of different elements of this data. These analyses cover graduates initials' and name lengths, as well as the distribution of latin honors over time. While the included analyses are interesting and informative, **wcgrads** allows the user to perform their own examinations by including the cleaned version of these catalogs.

Data

The data for this package comes from Course Catalogs posted online by the Williams College Registrar. These files are first downloaded and then converted to pdf using the pdftotext executable. After being converted to .txt, the catalog is cut down to just the list of graduating seniors and then cleaned into a single line of data per graduate. Once in this single line format, all graduating classes are combined into a single data frame of all students that graduated from 2000-2016. This data frame is called "allyrs" and it contains the Catalogs' information on name, Phi Beta Kappa, graduation year, latin honors, and departmental major. In addition "allyrs" adds gender to the information provided in the Catalogs. It is important to note that this is gender predicted by the R package **gender** using the method "ssa" and is almost certainly not completely correct. However, providing predicted gender gives package users additional, interesting information to analyze.

Analyses

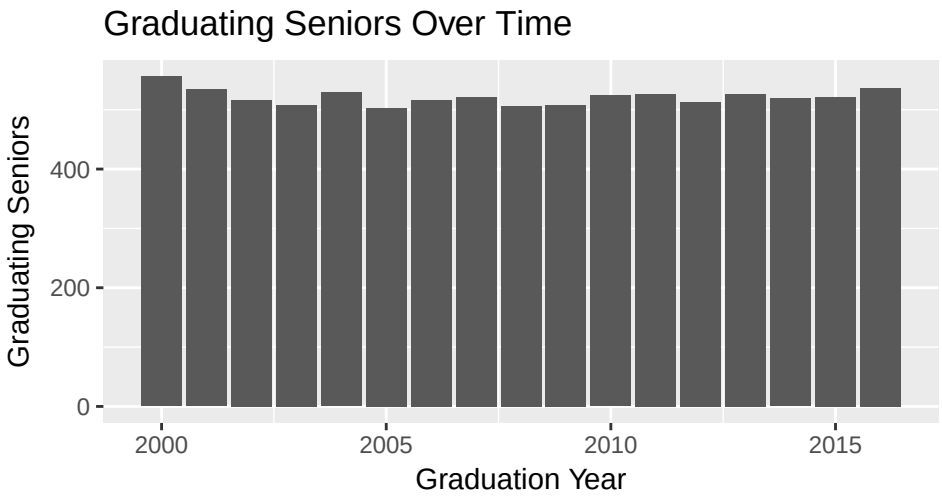
The first question we can answer using this data is "What is the longest name?". This question can be answered using the namelength() function.

```
library(wcgrads)
names <- namelength()
head(names, 10)
```

```
#> # A tibble: 10 × 3
#>                                    entirename namelength grad.year
#>                                         <chr>      <int>     <dbl>
#> 1  Susannah Sarah Mahinaokapolanialoha Fyrberg         40      2000
#> 2    William Oliver Sweetwater Parker Bobseine         37      2010
#> 3      JenniferAnne Lorraine McLellan Morrison         36      2012
#> 4       Oloruntosin Adepeju Ifedadepo Adeyanju         35      2008
#> 5       Christophe Alexander Dorsey-Guillaumin         35      2010
#> 6      Pierre-Alexandre Charles Meloty-Kapella         35      2010
#> 7       Bhuvaneswari Ettinamane Narendra Reddy         35      2011
#> 8     Chloë Iambe Naomi Illyria Feldman Emison         35      2012
#> 9        Katharine Elizabeth Huntress Peterson         34      2008
#> 10       Quinn Christianna Sanborn Brueggemann         34      2010
```

Next we can answer the question "How has the number of graduating seniors changed over time?". The gradcount() function can answer this question easily by provinding a graph showing the change over time.

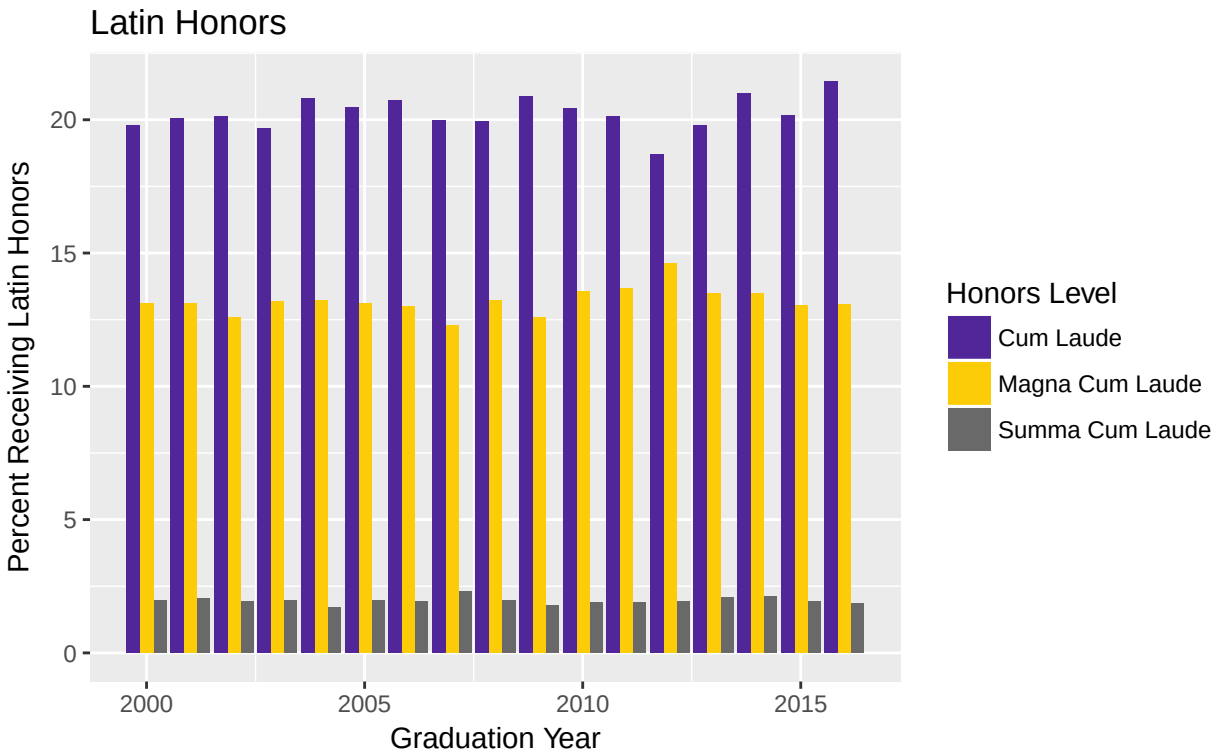
```
library(wcgrads)
gradcount()
```



This chart shows the raw number of graduates from Williams College, by year. 2000 had the most graduates while 2005 had the fewest graduates.

Yet another question that the allyrs data allows us to answer is "How has the distribution of latin honors changed over time?". **wcgrads** has a function for that as well. latin_honors() shows the percentage of students that received each level of latin honors by year. There is no general trend, but there is a decent amount of variation. Perhaps the variation can be explained by equal GPA's and the methodology used in the case of such ties.

```
library(wcgrads)
latin_honors()
```



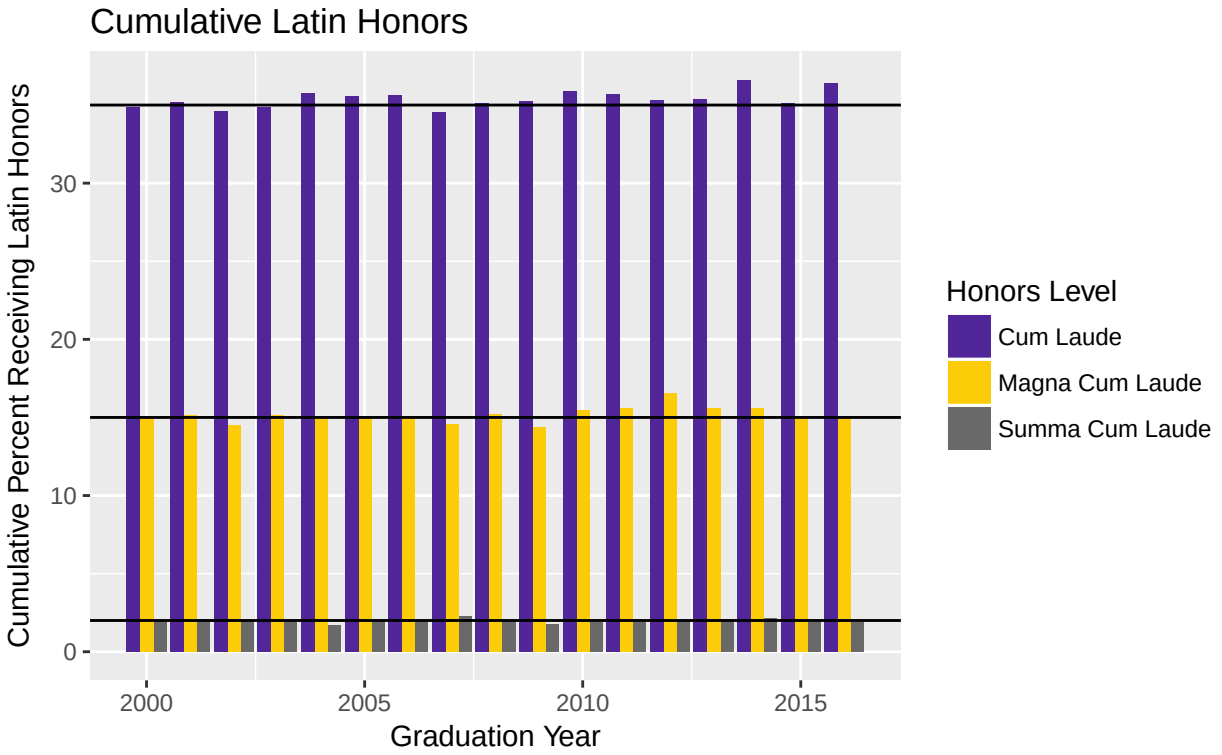
The percentages of graduating seniors who received each level of latin honors. There is no overall trend but they seem to be related in their variation, due to the phrase 'at least' in the guidelines.

Delving further into latin honors, we find that the following in the Course Catalogs:

"The Faculty will recommend to the Trustees that the degree of Bachelor of Arts with distinction be conferred upon those members of the graduating class who have passed all Winter Study Projects and obtained a four year average in the top: 35% of the graduating class — Bachelor of Arts cum laude or higher 15% of the graduating class — Bachelor of Arts magna cum laude or higher 2% of the graduating class — Bachelor of Arts summa cum laude"

The total_latin_honors() function shows the percentage distributions of cumulative latin honors, and compares them to the guidelines(in black) found in the Course Catalogs. Again there is no real trend, but there is inconsistency. For all of the levels of honors there are years where the distribution exceeds the guidelines, and years where it fails to reach the guideline. This is confusing because one would expect that if a tie did not allow the exact percentage to earn a certain level, there would be consistent rounding up or rounding down, such that the cumulative percentages are consistently above or below that recommendation. This variation causes concern because these honors are distinctions that appear on resumes, and that people work hard to achieve. It therefore seems unfair that latin honors are given liberally in some years and conservatively in others, without a clear methodology.

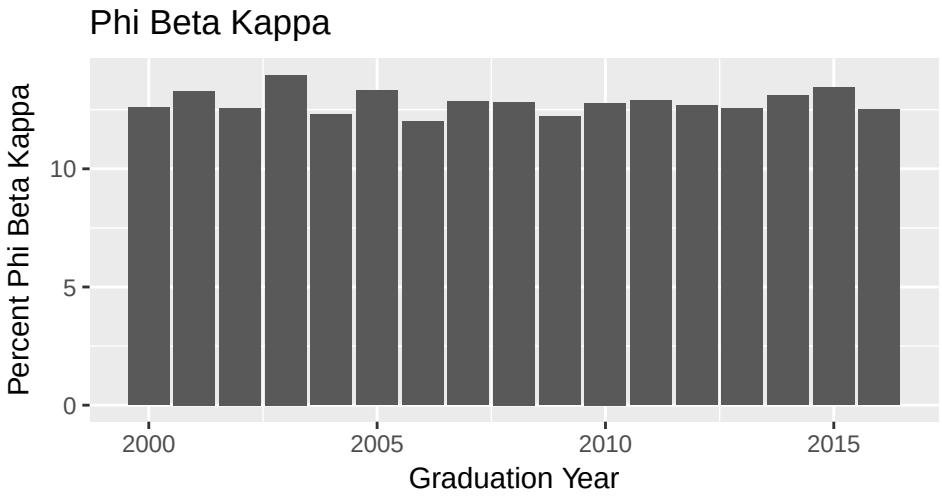
```
library(wcgrads)
total_latin_honors()
```



This figure shows the percentage of seniors that received at least each level of latin honors.These levels are compared to the guidelines set forth in the Course Catalogs, which are denoted by the black lines.

A simple investigation into how Phi Beta Kappa has been awarded over time reveal that between twelve and thirteen percent of students graduate Phi Beta Kappa, and that level has stayed fairly constant, with some variation.

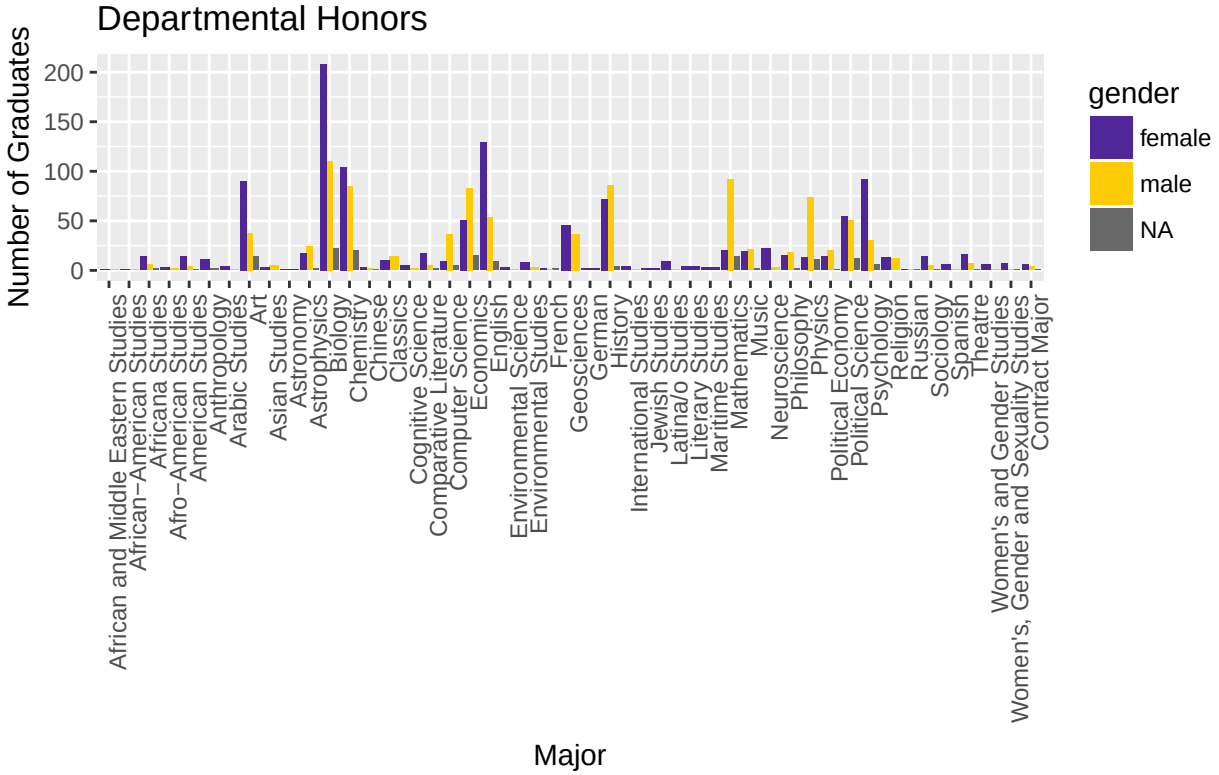
```
library(wcgrads)
pbk()
```



Proportion of Phi Beta Kappa students each year.
2003 has the highest percentage and 2006 has the lowest.

Two of the remaining unused variables in the allyrs dataset are departmental honors and predicted gender. The dept_honors() function gives a chart that shows the raw number of graduates with honors from each department, and their gender skew. Again, it is important to note that this is predicted gender, but the figure still likely gives an approximation of the makeup of each department. Biology has the most graduates with some level of honors, and it appears that Mathematics is the most skewed by gender among those receiving honors.

```
library(wcgrads)
dept_honors()
```

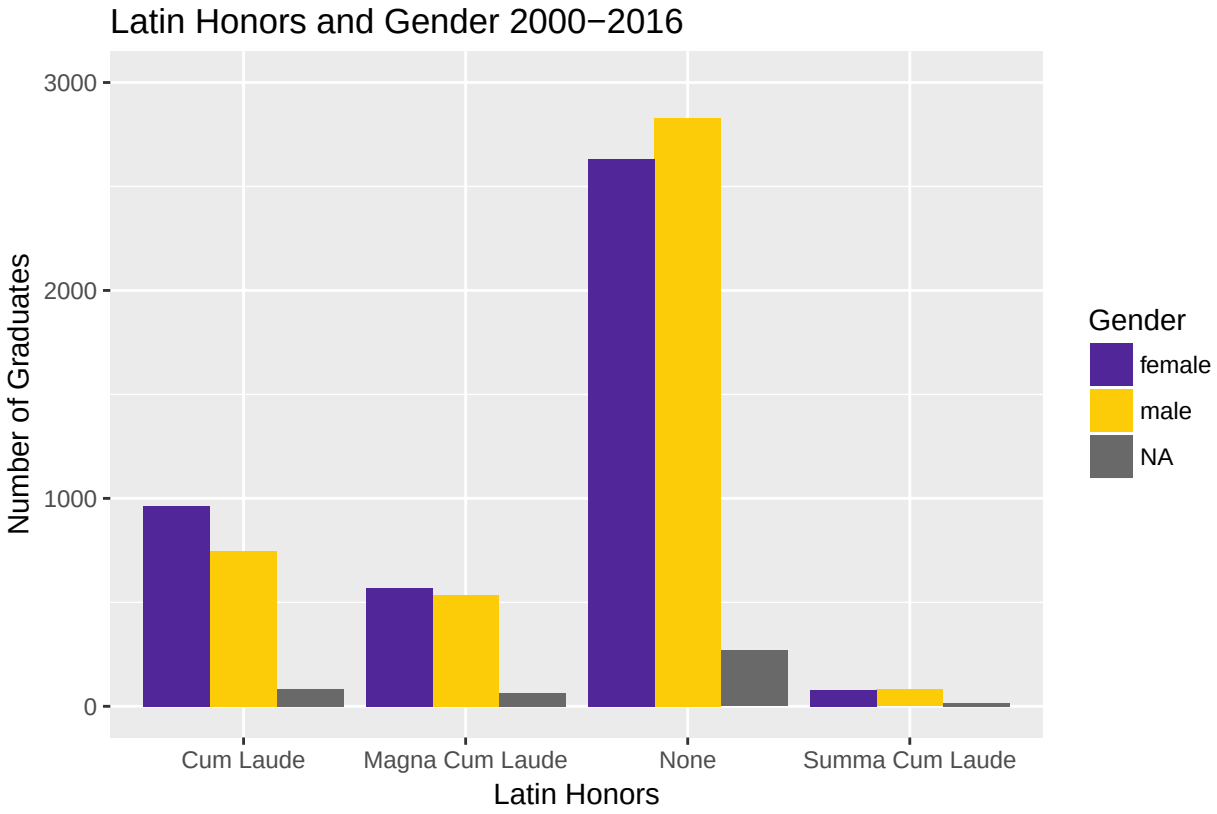


Total number of graduates earning some level of departmental honors, by major.
Gender is predicted from the R gender package.

In addition to the departmental honors and gender, **wcgrads** provides data about latin honors and gender. We can see that over this time period slightly more men earned Summa Cum Laude than women, while a few more women than men acheived Magna Cum Laude. The differences for Cum Laude and no honors is much more. Significantly more women than men earned Cum Laude, while more men than women did not earn latin honors. From this chart we can infer that the average woman has a higher GPA than the average man. However, at the Magna Cum Laude and Summa

Cum Laude levels, there are only minor differences, which suggests the variance of male GPAs is larger than females'.

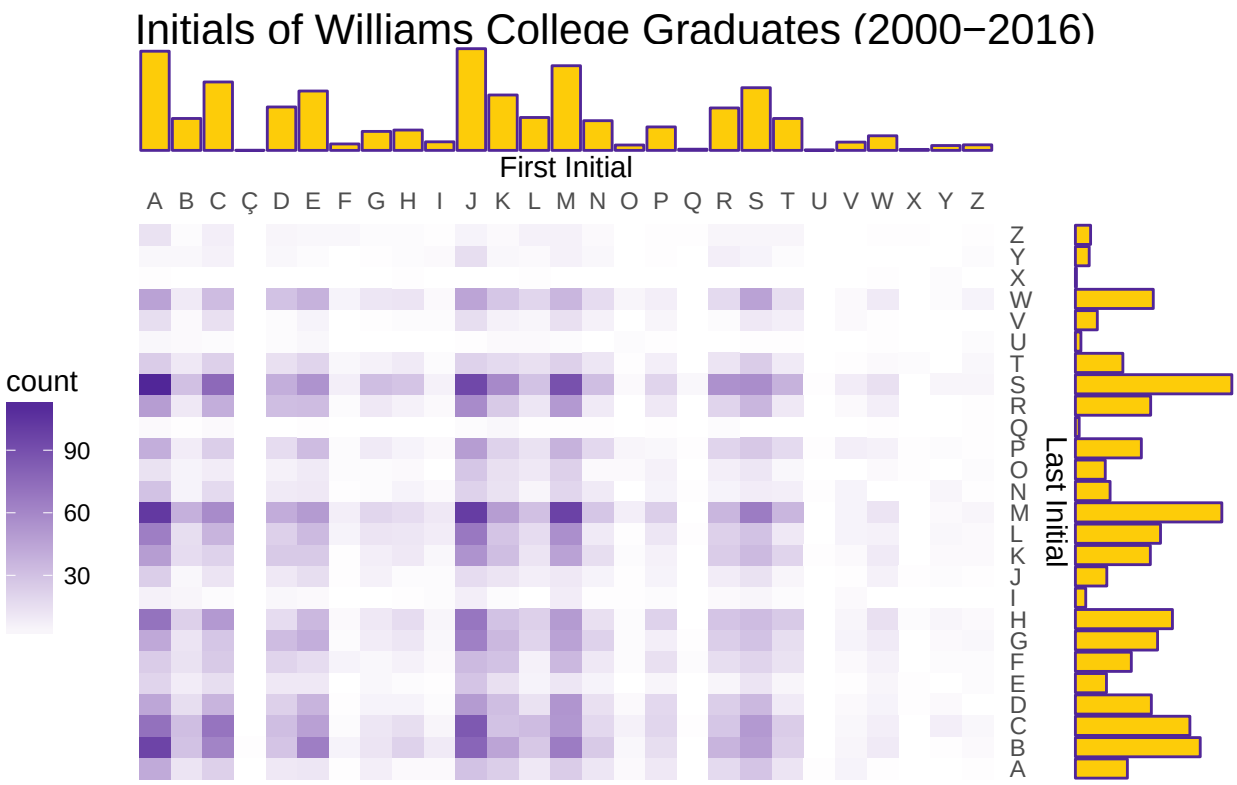
```
library(wcgrads)
latin_honors_gender()
```



The number of students of each gender acheiving each level of latin honors.

A final, somewhat more trivial analysis of the data involves the distribution of initials. The initials() function performs this analysis and shows both the joint and marginal distribution of initials. Looking at the plot generated, we see several main trends. First, the distribution of last initials appears to be much more even than the distribution of first initials. This suggests that there may be some letters that are more popular than others. When given the choice of first initial, letters A-E, J-N, and R-T are given more than other letters. This could also simply be because there are more options for first names that start with these initials. The difference between first and last initals appears to be greatest in F-H and W, which all occur as last initials much more often than they do as first initials. Another interesting aspect of the graphic is observing which first initials are more or less popular given a last initial. For example, L and K occur as last initials at a similar rate. However, the pairing CL occurs much more frequently than the pairing CK, possibly due to avoidance of alliteration. Inversely, while E and K occur about as frequently as first names, EC occurs much more than KC. The plot offers the opportunity to make many other observations, and I invite the reader to explore them. Further advancements on this subject could include showing change over time, further breakdown by name, or breaking this down by sound rather than letter to further examine how sound affects name choice.

```
library(wcgrads)
initials()
```



This figure shows the distribution of first and last initials among Williams College Graduates. A and J are the most popular first initials while S appears to be the most frequent last initial.

Conclusion

The **wcgrads** package uses the "allyrs" data to answer a number of questions, both important and trivial about Williams College graduates. The limited analyses included in the package also raise interesting questions ranging from how names are chosen to how the College handles ties in GPA when awarding latin honors. More important than any question it asks or answers, **wcgrads** makes information buried in the Williams College Course Catalog easily available to anyone who wants to analyze it.

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