

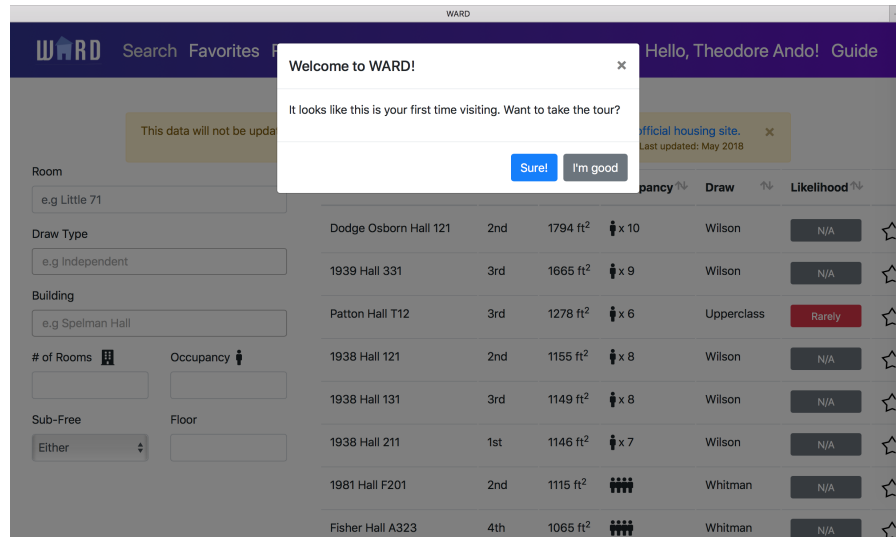
## WARD Product Guide

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# USER GUIDE

## Getting Started

**WARD**, your Web Assistant for Room Draw, is a web application that can be found at <http://rooms.cs.princeton.edu/>. On your first visit to the site, you will be redirected to Princeton University's Central Authentication Service to log in. After doing so, you will be greeted by the following:



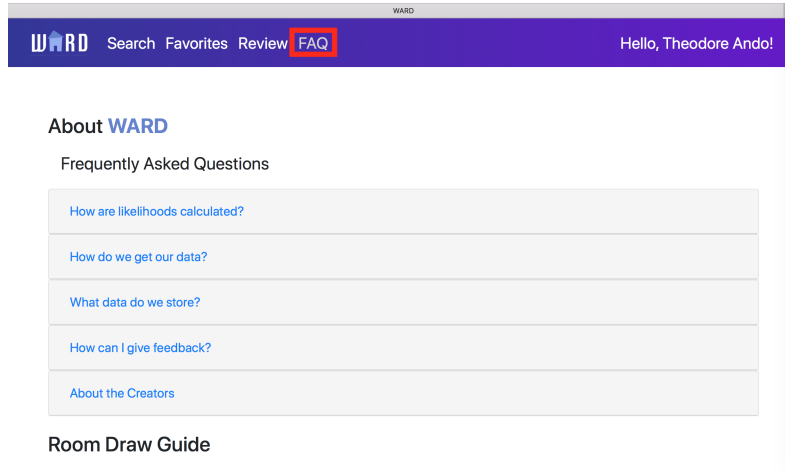
We suggest taking the brief tour of the site to get an idea of the main features that **WARD** offers.

## Room Draw is Approaching

Searching for the perfect room can be a long and arduous process. It involves visiting many websites and resources before you can come to a final decision. In this guide, we will walk you through the process that you might take as a rising junior. This use case is illuminating because rising juniors have many potential rooming options, but they select their room after seniors, meaning they need to make the most of the data available to them.

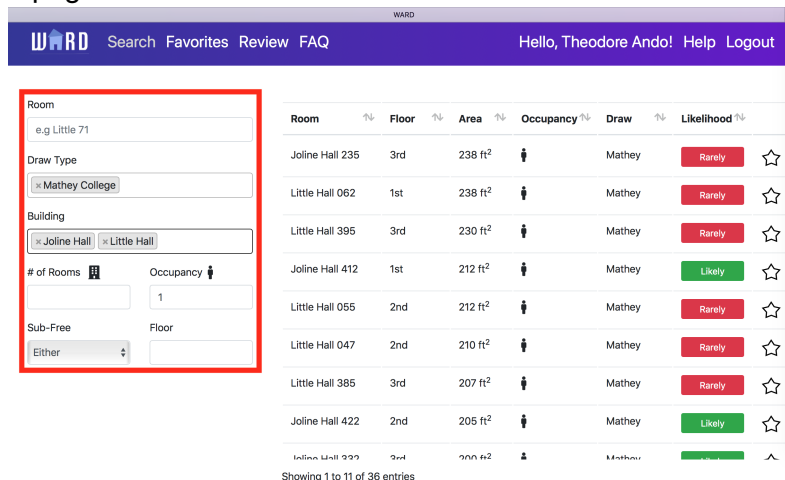
## Rules and Regulations

Room draw is a complex process, with many rules, and even more rumors, circulating around it. With **WARD**, we endeavored to provide the most comprehensive room draw guide on campus. We compiled information from all of the official sources we could find, as well as drawing on the past experiences of students to produce an up-to-date explanation of every step of the process. You can find the guide by navigating to the FAQ page of **WARD**'s website.



## Searching for Rooms

After using the guide to get an understanding of the draw process, you can begin to look at rooms on our main page:



On the left side of the page are the filters to narrow down the set of rooms in your search. If you would like to look for a room in particular, it is easiest to use the **Room** field, which responds to a variety of spellings. Otherwise, you can select one or more **Draw Types** and **Buildings**. This is useful for when you are interested in many rooms across campus. The images shows filters for singles in Mathey College, in Joline and Little. On the right side, is a table of rooms matching your filters.

WARD Search Favorites Review FAQ Hello, Theodore Ando! Help Logout

Room: e.g Little 71

Draw Type: Mathey College

Building: Joline Hall, Little Hall

# of Rooms: 1 Occupancy: 1

Sub-Free: Either Floor:

Room	Floor	Area	Occupancy	Draw	Likelihood
Joline Hall 235	3rd	238 ft <sup>2</sup>	1	Mathey	Rarely
Little Hall 062	1st	238 ft <sup>2</sup>	1	Mathey	Rarely
Little Hall 395	3rd	230 ft <sup>2</sup>	1	Mathey	Rarely
Joline Hall 412	1st	212 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 055	2nd	212 ft <sup>2</sup>	1	Mathey	Rarely
Little Hall 047	2nd	210 ft <sup>2</sup>	1	Mathey	Rarely
Little Hall 385	3rd	207 ft <sup>2</sup>	1	Mathey	Rarely
Joline Hall 422	2nd	205 ft <sup>2</sup>	1	Mathey	Likely

Showing 11 to 11 of 36 entries

In the table, you can see basic information about the rooms, as well as a likelihood predictor. The predictor uses your draw time, in conjunction with the historical data, to estimate your chances of getting a room. You can get more information on a given room by clicking on it:

WARD Search Favorites Review FAQ Hello, Theodore Ando! Help Logout

Room: e.g Little 71

Draw Type: Mathey College

Building: Joline Hall, Little Hall

# of Rooms: 1 Occupancy: 1

Sub-Free: Either Floor:

**Little Hall 318**

Mathey Rarely

Floor: 3 Area: 159 ft<sup>2</sup> Rooms: 1

Available Images: No images available.

Rating: 4/5

My favorite room of all 4 years at Princeton. Spacious single however, reported square-footage is a bit misleading because there is some un-useable space like a single step up into the room upon entering the room and a small window nook that could fit a chair or small bean bag perhaps. Can get noisy on nights out since it backs up to the slums.

Room	Floor	Area	Occupancy	Draw	Likelihood
Little Hall 318	3rd	159 ft <sup>2</sup>	1	Mathey	Likely
Joline Hall 312	1st	156 ft <sup>2</sup>	1	Mathey	Likely

Showing 11 to 21 of 36 entries

Here, you can see any reviews your fellow students have left. This is useful in a variety of scenarios. For example, some rooms have a large area, but not all space is usable, such as in Little 318, seen above. The icon in the upper right corner of the modal tells you that the room is substance free.

After applying filters, you may want to sort your results. Clicking on the headers in the table allow you to sort by columns. You can even sort by multiple features such as by likelihood and area simultaneously by shift-clicking on the columns in the order you wish to sort them:

The screenshot shows the WARD search interface. At the top, there is a navigation bar with 'WARD', 'Search', 'Favorites', 'Review', 'FAQ', and a user greeting 'Hello, Theodore Ando!' with 'Help' and 'Logout' links. Below the navigation bar, there are search filters on the left and a table of results on the right.

**Search Filters:**

- Room: e.g Little 71
- Draw Type: Mathey College
- Building: Joline Hall, Little Hall
- # of Rooms: 1
- Occupancy: 1
- Sub-Free: Either
- Floor: (empty)

**Table of Results:**

Room	Floor	Area	Occupancy	Draw	Likelihood
Joline Hall 331	3rd	155 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 367	3rd	137 ft <sup>2</sup>	1	Mathey	Likely
Joline Hall 233	3rd	131 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 305	3rd	123 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 309	3rd	119 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 325	3rd	118 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 327	3rd	118 ft <sup>2</sup>	1	Mathey	Likely
Little Hall 307	3rd	116 ft <sup>2</sup>	1	Mathey	Likely

Showing 1 to 11 of 36 entries

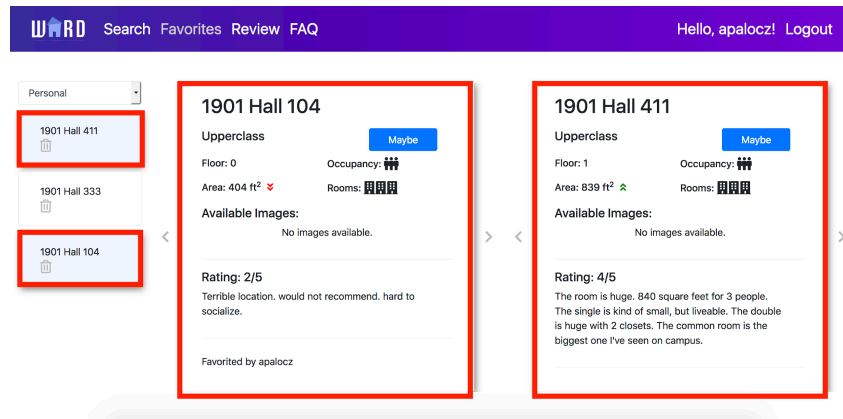
## Favoriting Rooms

You can favorite rooms that you find on [WARD's](#) search page by clicking on the star in the right-most column of the table. Rooms that you favorite will be added to your personal favorites list, as well as the list of your corresponding draw group. You will be able to view them on the Favorites page.

## Comparing Rooms

On the Favorites page, you will find a list of your favorited rooms on the left panel, as well as two windows for viewing the rooms in more detail and for comparing them. You can select rooms to inspect by clicking on them in the left panel. You can also right-click on a room to lock it in place. You will probably find this useful when you want to compare a single room against many others.

When you open up a room for viewing, you will find relevant details at the top of the window, as well as pictures, comments, and reviews of the room toward the bottom. Additionally, when you view two rooms with the same occupancy, comparison features will be automatically enabled to bring to your attention the differences in size and number of rooms. We hope that you will find this information useful as you navigate through room draw.



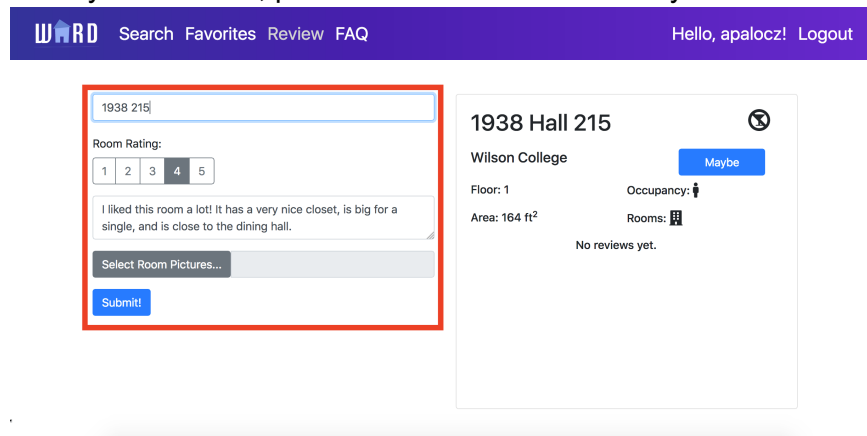
You can also reorder the rooms on the left panel by dragging and dropping. This ordering will be saved across sessions, so you can use this feature to help prioritize your rooms.

## Collaborating with Your Group

On the Favorites page, you will be able to select from the drop-down menu a list of rooms to view. In addition to a personal list, there will be one list for each of your draw groups, and those lists will be shared among members of draw groups. Favoriting a room will automatically add it to the appropriate draw group list. As with your personal list, rooms in these lists can be reordered, and the order will be saved across sessions.

## Leaving a Review

To leave a review of your room, navigate to the Review page. Use the search bar at the top of the page to find your room. Once you have found your room, you can leave a rating out of five. There is also space to leave any comments that you have on your room, such as how close it is to amenities, how the temperature control works, etc. There is also an option to upload pictures of your room. When you are done, press the “Submit” button and your review will be saved.



You can enter a review without pictures or text, but we really do appreciate them!

# DEVELOPER GUIDE

## Front End

HTML/CSS - `rooms/templates/`, `rooms/static/stylesheets/`

The HTML files for our website can be found under the “`templates/`” folder. We use Jinja2 templates to allow for dynamic editing on the server side to tailor the page to the user and to allow flexibility to change our directory structure. The file “`base.html`” contains imports (such as Bootstrap, JQuery, and FontAwesome) that are relevant to every page of our site, and is thus included in all pages. Each of our main pages has its own folder under “`template/`” which contains template HTML files relevant to that page.

The CSS files for our website can be found under the “`static/stylesheets/`” folder. They are added to the appropriate web pages via Jinja2 templating. Likewise, there is a “`base.css`” file that contains global styling options that is included on every web page, and each page has its own private CSS file (with the same filename as the page).

We make heavy use of Bootstrap to handle styling and resizing of our website across multiple devices. We also use FontAwesome glyphicons extensively across the site. (For example, the person symbol in the occupancy column are FontAwesome icons)

JavaScript - `rooms/static/javascript/`

The JavaScript files for our website can be found under the “`static/javascript/`” folder. We make heavy use of jQuery and its asynchronous request feature (AJAX) to dynamically update our website. Most of the user interface interactions are added to the web pages dynamically via jQuery (we seldom use HTML attributes, such as `onclick`, in our code). Dynamic styling changes are typically done by adding or removing predefined classes (in our CSS files) instead of editing inline styling (i.e. the `style` attribute).

The JavaScript code base is modularized so that each page has its own “.js” file, and important components, such as our “big card,” are placed into their own files (e.g. “`big_card.js`”).

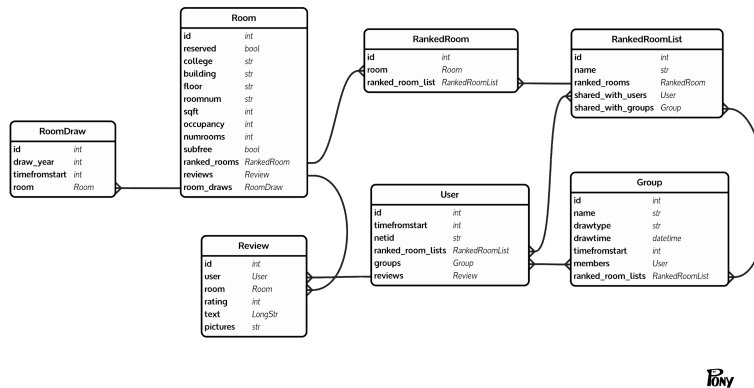
### Dependencies

We relied on the jQuery DataTable module to display the list of searched rooms, and IntroJs to display our walkthrough. We used Select2 to make it easy to select more than one filter option in the Buildings and Draw Type selects. We also relied on JsCookie to manipulate cookies on our website, in particular to remember if the website had been visited before. We relied on Bootstrap, FontAwesome, and JQuery, as mentioned above. We access all of these through CDNs imported in “`templates/base.html`”.

## Back End

Database - `rooms/dbmanager.py`

**WARD** stores a lot of information about rooms. They are stored in a MySQL database. An overview of the structure can be seen in this Entity Relation diagram:



The file `dbmanager.py` describes this table structure using an ORM called Pony. It also provides helper functions so that the currently running Flask application can access the appropriate database. It dynamically detects whether the application is running in a production or a development environment and uses either the MySQL configuration for production or a SQLite configuration for development.

To get the Room information, we used data from the current Rooms TigerApp. We populate the Group table with the lists of draw groups that the Housing Department publishes each year. We have two years of data on when each room was drawn, and we filled the RoomDraw table with this data. This allows us to compute likelihoods.

Loading Data - `rooms/generate_db.py`

You can use this script and its functions to generate the database. This is easier than trying to make automatic migrations when changing the schema. This script loads information on rooms, historic draw times, and groups.

Searching - `rooms/query.py`

The main function to filter and sort rooms can be found in `query.py`. Here we define the `/query` endpoint. It responds to GET requests, with a variety of URL parameters (as defined in our API document linked in the Appendix). Querying with a set of parameters returns rooms that are in the intersection of all filters. Some parameters are lists however, such as **college** and **building**. For these parameters, rooms are matched if they match the union of the selected



colleges or buildings followed by the intersection of other filters. To perform the query, we use the `select` method provided by PonyORM.

One important point to note is that the `/query` endpoint also accepts a free form text field `q`. To parse the user's input, we tokenize the string and then match each token against a list of aliases for buildings, colleges, and room numbers. For example, the token "Dodge" would be matched to "Dodge Osborn Hall." The rooms selected by the query function must match both the colleges and buildings parsed out of the free form field as well as the college and building filters passed directly by URL parameter. *Exempli gratiā*, if the user has selected "Mathey College" as a filter, and then searches in the free form field for "Witherspoon Hall 206," then no results will be returned because Witherspoon Hall 206 is not in Mathey College.

#### Favorites - `rooms/favorite.py`

Here in `favorite.py` we defined the endpoints for managing your personal favorites list and your groups' favorites lists. This is done in the typical way, except that the logic for adding a new favorite and removing a favorite are slightly different. Favoriting a new room adds the room to the user's personal favorites list as well as the appropriate draw group's list. Unfavoriting on the other hand requires you to specify either a group's list to remove the room, or the user's personal list. This is because a person might want to keep a room on their personal favorites list even if it's not relevant to the group.

#### Likelihood - `rooms/likelihood.py`

This is simply one function that computes the likelihood the user will be able to draw a given room. It works by fitting a normal distribution to the draw data we have on that room. Then it looks for the draw group appropriate to that room and computes the percentile of your draw time in this distribution.

## Appendix

See [this](#) PowerPoint for an introduction to [WARD](#) that we gave at our demonstration.

A detailed description of our API can be found [here](#).