

# Structure of Networks Web Guide

## General Structure

### User Authentication:

To manage user authentication, users who are not logged in are automatically redirected to the login page, where they are then prompted to login with Yale-CAS. The server validates their credentials and redirects them to the website, where they can use those credentials to access content on the site.

There are two types of users: Students and TAs. This guide will be split in two based on the actions that each user can perform.

### TA:

When the script is first run, it will automatically create a TA for the course, specified by command line arguments (see later in the document for a full list of command line args).

TAs have the responsibility of managing the course. They can add students, add other TAs, create assignments, and take the website offline. This is all done from the manage tab.

TAs are also registered as students in the class. As such, they are also given individualized parameters and can submit answers and interact with the course just like a student. They can switch back and forth between these views by using the button in the top right corner of the app.

### Add Students:

TAs can add students, either as individual students or as a list. As a list, the TA lists names, which are then matched 1 to 1 with a corresponding list of NetIds. The TA can also search the list of students.

Adding TAs works in a practically identical way, but the student is designated as a TA and has a higher access level, capable of editing assignments, seeing grades, etc.

## **Download Grades:**

The TA can press this button to download a CSV containing all members of the class and their grades for each assignment that has been published.

## **Edit Assignments:**

This is the bulk of what the TA does, and it is the most complicated out of the three tabs. Each assignment can be published, active, or an exam. If an assignment is not published, it is invisible to all the students. If an assignment is inactive, students are prevented from submitting answers to the assignment, but they can still see it. If an assignment is an exam, students only have one attempt to complete the assignment. Usually attempts are unlimited.

An assignment is composed of questions. Each question has some kind of format, which is specified by the teaching assistant. The format can be written as HTML to include relevant formatting, pictures, etc. The format includes the ability to interpolate parameters into it, by adding text in the format of  $\${n}$  where  $n$  is the parameter number. These parameters are generated according to some rule specified by the TA. The rule takes the form of python code, and it must set a variable named "params" to be equal to some array of values. These values should be generated randomly such that each student has a different assortment of them.

Each question then has a variety of parts. This is where a student actually inputs their answer and views the status of that answer. Parts have a direction (e.g. calculate this thing based on the parameters that were shown to you during the question) and then a grading rule for establishing the correct answer, which will likely depend on the parameters. The parameters can be referenced in the grading rule using the same syntax as in the question. Both the grading rule and param rule can be tested to find sample output. The grading rule also has a particular syntax, it must take in the student's answer (interpolated as  $\${s}$ ) and then set the test\_res variable to either true or false, depending on the other parameters. Each part is also worth a certain amount of points, which can be specified here. A question is worth the sum of its parts, and an assignment the sum of its questions.

## **Student:**

The student view is much simpler. They are given a list of all published assignments, and they can select an assignment, and then a question. At this point, the question, with custom parameters substituted in is displayed. Then, they can choose a part, where the

direction comes up. If the assignment is not active, they will still be able to view the question but they will not be able to submit an answer.

They can answer the question part and then see the status of their answer after it is graded. In addition, they can go to the grades tab of the course to see a summary of all their grades for the course.