



## UNSW *cupcake*

**cupcake** is the practice and competition site for ProgComp, the UNSW High Schools Programming Competition. It's available for use by all Australian schools, or to parents of home-schooled students. Schools must be registered with the site.

### Quick Start Guide – Teachers

1. If your school isn't yet registered you can send a registration request using the link on the front page <https://cupcake.cse.unsw.edu.au/school/registration>
2. When you receive a response by email, click on the supplied link to complete the registration. If your school has registered before there will be a school admin. If that teacher is no longer with the school, email [cupcake@cse.unsw.edu.au](mailto:cupcake@cse.unsw.edu.au)
3. Create practice teams at any time. Unlike competition teams, practice teams are not formally linked to students. Follow the suggested naming guidelines on the page and select the appropriate level. Team level affects the practice scoring scheme. Click on team name to edit.
4. Create a new assignment for some or all the teams, now or later. Click on the **Assignments** tab and then **New Assignment**. You can do the following:
  - Select one or more practice teams
  - Set the open and close date/times for the assignment. The assignment is available to the selected teams within this period.
  - Set the maximum duration of the assignment. The clock starts for a team when they select their first task. Use the notation shown under the box.
  - Specify how much choice teams have when presented with a list of tasks. They can be allowed to see everything about a task (name), only the level and difficulty (difficulty) level only (level) or nothing. Hiding some aspects discourages students from task browsing if there are many tasks to choose from.
  - Set a limit on the number of tasks each team can attempt. This also discourages shopping around.
5. You can adjust the task level and difficulty range sliders, exclude all tasks with particular tags, or exclude selected tasks. Press **Show Matching Tasks** after changing the criteria. Click on any task name to see the task description, hints (teams have to explicitly open each one) and test data if applicable. After reviewing the requirements, press **Create Assignment**.
6. Review the assignment summary, you can edit the parameters.
7. Back on **Practice Teams**, advise the relevant students of their login name and passcode. After they have submitted something you can click through to their summary page, and then to any completed task. Their last submission is retained for you to review.
8. Log off. This returns to the public cupcake page, [cupcake.cse.unsw.edu.au](https://cupcake.cse.unsw.edu.au) **Login** is at the top right. Teams use the left hand box (they have to select the school) and teachers the right.





## Glossary

Term	Explanation
<b>Task</b>	A problem to be solved by a team using any programming language that has source code in text form, and can consume multi-line input text and produce output text.
<b>Assignment</b>	A time-limited event where teams can attempt practice tasks from those specified by the teacher, or real tasks set by the competition Convenor.
<b>Level</b>	Team capability and matching task complexity. <b>Junior</b> – Up to year 8. Tasks are routine, requiring basic coding skill. <b>Intermediate</b> – Year 9 or 10. Task solutions require some depth of knowledge of the language and techniques in algorithm design. <b>Senior</b> – Years 11 or 12. Tasks require sophisticated solution design.
<b>Difficulty (relative)</b>	Descriptive term applied to tasks at each level: Easy, Easy-Mod, Moderate, Mod-Hard, Hard. There are no Easy Senior tasks or Hard Junior tasks.
<b>Difficulty (absolute)</b>	Task difficulty on a single numeric scale from 1.0 to 9.9, incorporating the level and relative difficulty. Used for scoring.
<b>Points</b>	Units in which each practice task is scored, independent of difficulty. The usual maximum is 100 points, and test results (practice only) are assessed according to how well they apparently meet the task requirements.
<b>Hint fees</b>	Hints are available for teams who are having difficulty solving a task (not all tasks have hints). To encourage capable teams to devise their own solution approach, hints that the team elects to view reduce the maximum available points for the task by a publicised <i>hint fee</i> . If the team's achievement is lower than the adjusted cap, their score is not affected.
<b>Score</b>	A final, net score assigned to a team's attempt at a task. It's equal to the points assigned (possibly capped by hint fees) divided by 100, then multiplied by the task difficulty and by a factor that's determined by the team level. Currently the level factors are 1.5 for Juniors, 1.2 for Intermediate teams and 1.0 for Senior teams. Scores accumulate without being reset, however if the same task is attempted in different assignments the maximum score for that task is counted, not all attempts. Time bonuses may also be available in a future version of cupcake.
<b>Ranks</b>	Teams that have a non-zero total score are ranked two ways. Ranks are displayed on the team home page: <b>School rank:</b> where the team is placed with respect to all the school's teams, including those who haven't scored anything, and <b>Level rank:</b> where they are placed with respect to all teams using cupcake from any school, provided they have a non-zero total score.  The team's score is displayed as a progress bar along with the population's median score. If there are few teams or non-unique ranks the position of the median bar is only approximate.



# Cupcake User Guide

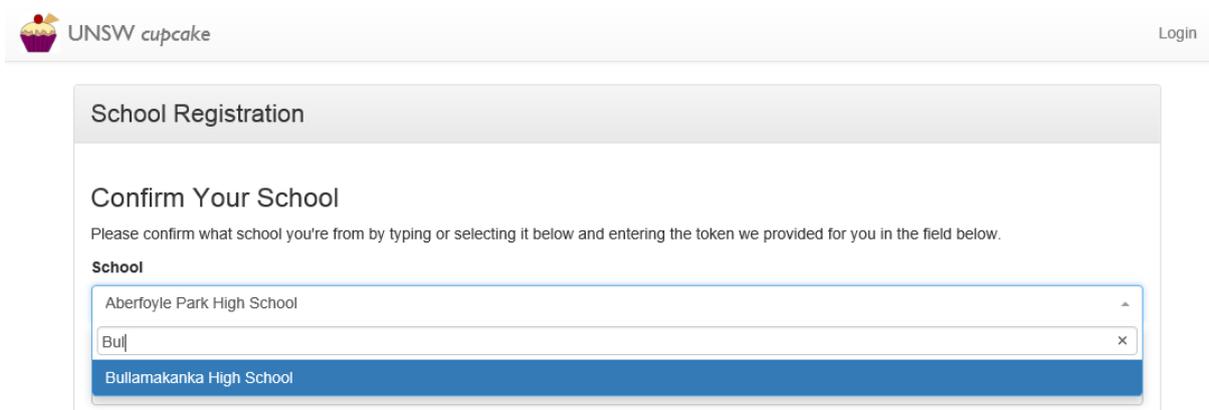
To use the cupcake site,

- Your school has to be recorded on the cupcake database, and
- Someone from the school must use the registration token supplied by email to create an admin account, which doubles as a teacher's account<sup>1</sup>.

## Registration and Admin Account

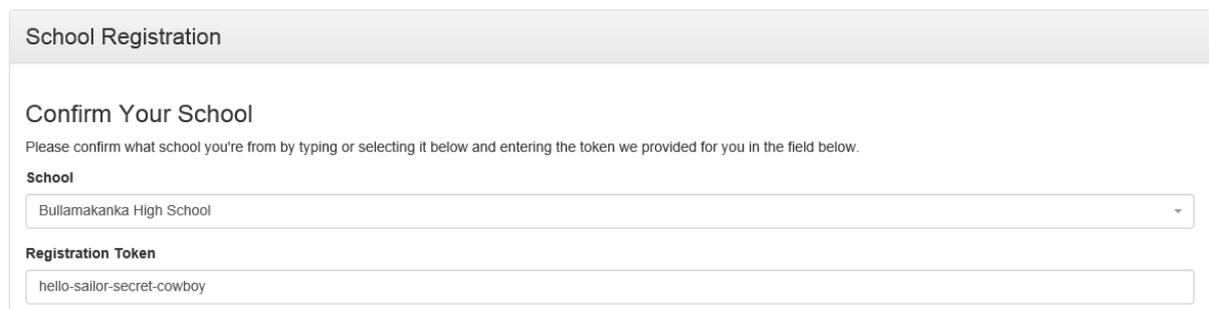
The email that includes the token will confirm the school's name as recorded in the cupcake database, and will include the registration URL:

<https://cupcake.cse.unsw.edu.au/school-registration>



The typeahead selector is an off-the-shelf product that sometimes doesn't offer the best match if a name starts with a common substring. Be patient.

The token is a sequence of words in lower case separated by hyphens. It can be pasted or typed.



The admin user's credentials must be established next, in the lower part of the form. Required fields:

**User Full Name.** It's for cupcake's use and displayed on most pages, call yourself what you like.

**User Email Address.** This is the user's login name and must be unique across all cupcake users. It can be a school or private address, but type it carefully as it's the recovery email for forgotten passwords.

**User Password.** Length 8 or more characters, 1 or more digits, 1 or more non-alphanumerics.

**Confirm User Password.**

<sup>1</sup> For this version only one account can be created, future versions may allow for additional teacher accounts.



## Set Up School Administrator

You'll need to set up a user to manage your school. This user will be responsible for adding other teaching staff (if needed), managing student teams, and creating practice scenarios.

To set up this user, enter their email address and the password they would like for their account in the fields below.

<b>User Full Name</b>	<b>User Email Address</b>
<input type="text" value="Robert Fripp"/>	<input type="text" value="robert@bmk.sa.edu.au"/>
<b>User Password</b>	<b>Confirm User Password</b>
<input type="password" value="••••••••"/>	<input type="password" value="••••••••"/>

Passwords must:

- contain at least 8 characters,
- contain at least 1 digit, and
- contain at least one character that is not a letter or a digit.

[Register](#)

When all fields are entered press **Register**. You will be logged on and taken to the Practice Teams page, which is the teacher's home page.

## Practice Teams

The Practice Teams page is where teams are created and practice results are summarised. Comp Teams will be maintained on a different page. The first step is to create a few practice teams.



### Practice Teams

Bullamakanka High School SA

**New Team**[Create Team](#)

<b>Name</b>	<b>Login</b>	<b>Level</b>
<input type="text" value="Brian and Kylie Yr 11"/>	<input type="text" value="BK-11"/>	<div style="border: 1px solid #add8e6; padding: 2px;"><div style="background-color: #add8e6; padding: 2px;">Senior</div><div style="padding: 2px;">Junior</div><div style="padding: 2px;">Intermediate</div><div style="background-color: #0070c0; color: white; padding: 2px;">Senior</div></div>
<small>Name should briefly describe who's in the team or how it's going to be used, for example, Kylie &amp; Jason Year 11.</small>	<small>Login should be short and contain only letters, digits and hyphens, for example: Yr11a, J002, SDD-12b etc.</small>	

Follow the recommended formats. Practice teams aren't tied to particular people, it's up to you to pass on the credentials according to how you'd like students to work. They may even be individual to assess core skills.

Fill in the two entry boxes, select the level and press Create Team. Re-edit and repeat.

Teams						
Name	Login	Passcode	Level	Type	Total Score	Rank
Brian and Kylie Yr 11	BK-11	beaches-weblogs-cells-being	Senior	Practice	0.0	N/A
Yihong, Clare, Karim	Yr10-YCK	daily-latinas-treasury-eugene	Intermediate	Practice	0.0	N/A
The Muppets Year 7	Yr7A	charity-welsh-perth-wired	Junior	Practice	0.0	N/A
The Simpsons Year 7	Yr7B	mysimon-volvo-friendly-cooler	Junior	Practice	0.0	N/A

Next steps: Click on any team to edit or view detailed results. Select **Assignments** from the main menu to create or update assignments.



## Updating Practice Teams

Click on a team name to edit the name or level, or just to view the teams 'results.

Yihong, Clare, Karim

Total Score: 0.0

Intermediate

Practice

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### Update Team

Delete New Passcode Update

Name	Login	Level	Passcode
<input type="text" value="Yihong, Clare, Karim"/> <small>Name should briefly describe who's in the team or how it's going to be used, for example, Kylie &amp; Jason Year 11.</small>	<input type="text" value="Yr10-YCK"/> <small>Login should be short and contain only letters, digits and hyphens, for example: Yr11a, J002, SDD-12b etc.</small>	<input type="text" value="Intermediate"/> <small>Junior is Year 8 or below, Intermediate is Year 9 or 10 and Senior is Year 11 or 12.</small>	<input type="text" value="daily-latinas-treasury-eugene"/>

You can update any of the three fields. You can also delete a team, provided they don't have a current assignment. If they have a current assignment you'll see **Active** instead of a **Delete** button. Note that deleting a team *will also remove all their results*.

You can't choose a passcode for the team but you can ask for another bunch of random words.

For the remaining content on this page, see the section **Monitoring Teams**.

Use either the browser's back button or the top-level menu items to return to the team summary page.

## Assignments

Now you've created some teams you need to give them something to do. Click on the **Assignments** menu item. If there are no recent assignments the page is pretty plain:

 UNSW *cupcake* Practice Teams Assignments Robert Fripp ▾

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## Recent Assignments

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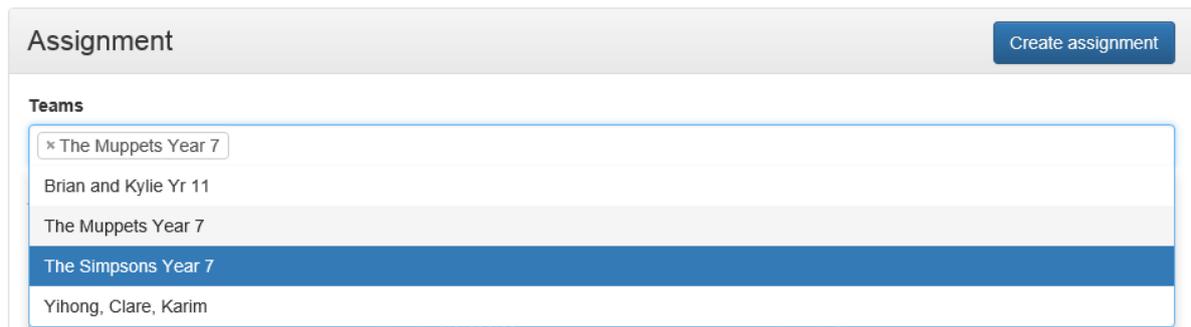
New Assignment

**New Assignment** is the way to go.



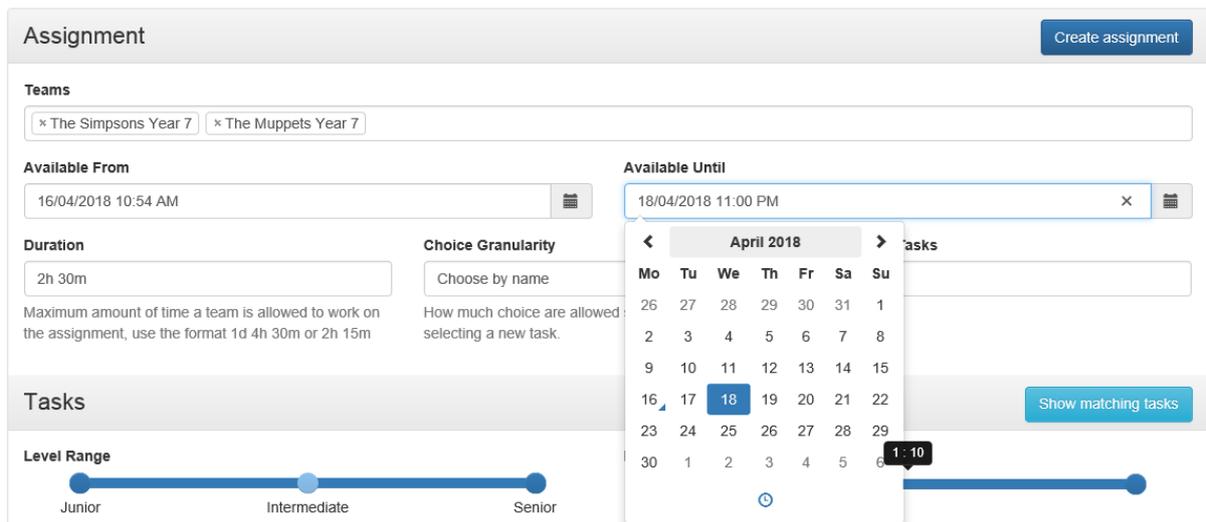
# New Assignment

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Click on the Teams box and select the teams you'd like to assign, one at a time.

Choose the beginning and end of the period during which the assignment can be started. You could specify a week or more if you like, or constrain it to a class period. The team clock only starts when a team selects their first task, so the actual practice duration can be more carefully controlled.



Three parameters that directly constrain teams are

**Duration.** It can be expressed in days, hours and minutes using the format shown.

**Choice Granularity.** How much detail to show the teams when they make a selection. *Choose by name* shows everything; *by difficulty* hides the name; *by level* hides difficulty too, and *No choice* gives no information. Used to minimise task shopping, but so does the next field.

**Maximum Tasks.** This is how many tasks can be viewed.



## Task Selection

You can set either a wide range of tasks or restrict the assignment to certain specific ones. To run a mini-ProgComp, for example, you might reserve a few good examples but run a practice assignment first with others of similar difficulty. The mini-ProgComp would then be a later, more time-limited assignment with a small number of set tasks they hadn't seen before.

There are four ways to specify what tasks an assignment includes for teams to select.

**Level Range:** use the slider. Level is a very broad category, so usually it can be left as all levels.

**Difficulty Range:** the difficulty slider sets both minimum and maximum difficulty on an absolute scale. Beginners should be set tasks only at the low end, say under 2.5. Experienced teams will find these too easy, but might be OK as warmups.

**Exclude Tags:** some tasks have assumed domain knowledge in areas such as mathematical notation (maths) or simulation principles (sim) or use of recursion (recursion) or backtracking games and so on. Brief tags are attached to all tasks, if they seem to reflect attributes that teams will react badly to specify them in the box. **Warning:** Internet Explorer doesn't interact properly with this control, give it a miss.

Explicit exclusion boxes. Use the checkbox to exclude any unsuitable task.

After a change, refresh the list with **Show matching tasks**.

### Tasks

Show matching tasks

**Level Range** Junior Intermediate Senior

**Difficulty Range** 1: 3.5

**Exclude Tags**

✖ maths

Type tags to exclude when selecting tasks, each followed by a space.

Exclude	Task	Level	Difficulty	Tags
<input checked="" type="checkbox"/>	<a href="#">Life Path Number</a>	Junior	1.2	digits chars
<input type="checkbox"/>	<a href="#">Detecting Cycles</a>	Junior	1.6	intseq dups
<input type="checkbox"/>	<a href="#">64 Doors</a>	Junior	1.7	sim state
<input type="checkbox"/>	<a href="#">Palindromes</a>	Junior	1.9	words chars letters
<input type="checkbox"/>	<a href="#">Plurals</a>	Junior	2.1	words
<input type="checkbox"/>	<a href="#">Word Isomorphs</a>	Intermediate	3.0	words chars
<input type="checkbox"/>	<a href="#">Numeroman</a>	Intermediate	3.5	codes chars

Click on any of the task names to see the task content in a view-only popup. It has three tabs:



**Description.** Same as the team would see, except for References (not shown to teams).

**Hints.** Same as the team would see after selecting all available hints. Suggestions about improving hints for particular tasks are welcome. The Pseudocode notation is deliberately not python, though it's very easy to map to python and similar languages. You may wish to advise weak teams to make use of the hints, but discourage more capable teams as they'll learn more from devising a solution themselves.

**Assessment.** Again same as the team sees initially, including any test data.

When you're happy with the selection, press **Create Assignment**, which returns to the Assignment summary page:

## Recent Assignments

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Assignment		Edit
<b>Difficulty</b>	1.0 to 3.5	
<b>Level</b>	Junior to Intermediate	
<b>Available From</b>	Mon 16 Apr 10:54 AM	
<b>Available Until</b>	Wed 18 Apr 11:00 PM	
<b>Duration</b>	2 hours and 30 minutes	
<b>Choice Granularity</b>	Choose by name	
<b>Maximum Tasks</b>	3	
Teams		
Team	Time Left	
The Simpsons Year 7	Not started	
The Muppets Year 7	Not started	

As well as summarising the assignment parameters, the team status is also shown.

While any of the parameters can be adjusted via the Edit button, try not to confuse students by changing things such as available tasks while it's active.



## Monitoring Teams

The **Practice Teams** page summarises the overall progress of each team. Results accumulate indefinitely, so the total score can only go up. Ranks are not calculated until a team scores.

Teams						
Name	Login	Passcode	Level	Type	Total Score	Rank
<a href="#">Brian and Kylie Yr 11</a>	BK-11	beaches-weblogs-cells-being	Senior	Practice	0.0	N/A
<a href="#">Yihong, Clare, Karim</a>	Yr10-YCK	daily-latinas-treasury-eugene	Intermediate	Practice	0.0	N/A
<a href="#">The Muppets Year 7</a>	Yr7A	charity-welsh-perth-wired	Junior	Practice	9.8	1st
<a href="#">The Simpsons Year 7</a>	Yr7B	mysimon-volvo-friendly-cooler	Junior	Practice	1.4	2nd

Click on a team name to see more detail about the team. Apart from the **Update** box, the view is the same as the team sees.

### The Muppets Year 7

Total Score: 9.8 Junior Practice

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#### Ranking

Within	Rank	Out of	Placement
School	1st	4 teams	
Level	2nd	3 teams	

#### Current Assignment

The assignment is running for the next 2 days, 11 hours and 16 minutes and practice tasks are available. Do you want to start solving the first task now?

#### Previous Assignment Results

Status	Task	Task Level	Difficulty	Last Accessed	Hints	Score
Partially solved in 5 minutes and 16 seconds.	<a href="#">Two Out of Three Ain't Bad</a>	Junior, Moderate	2.0	Sun Apr 15 21:55:43 2018	0 of 1	3.0
Solved in 4 minutes and 7 seconds.	<a href="#">64 Doors</a>	Junior, Easy-Mod	1.7	Sun Apr 15 15:30:24 2018	0 of 1	3.4
Partially solved in 40 seconds.	<a href="#">64 Doors</a>	Junior, Easy-Mod	1.7	Sun Apr 15 14:36:55 2018	0 of 1	1.4
Solved in 8 minutes and 5 seconds.	<a href="#">Palindromes</a>	Junior, Moderate	1.9	Sun Apr 15 14:15:26 2018	1 of 1	3.4

The *School* ranking includes all levels and **Out of** includes any non-attemptees. The *Level* ranking includes all teams of that level from any school using cupcake, but only if they have scored. The Placement bars are only meaningful when the number of teams is fairly large.

This team hasn't started the current assignment, but has done tasks in previous assignments, including *64 Doors* in different assignments, for which the maximum score counts. Their total score is

$$3.0 + \max(3.4, 1.4) + 3.4 = 9.8.$$

Click on a task name to view the team's last submission and the results of assessment. You could use this function to retrieve source code for discussion with the team or in class.



## Scoring

The cupcake practice scoring system is intended to reward effort relative to the expected capabilities of the team as represented by their level.

Each task is assessed based on what is pasted in the output box or boxes on the task Assessment page. Each task is worth 100 points. Common formatting errors or misinterpretations are identified and given partial points, along with brief feedback that may help the team understand why their program may be deficient. There is no limit to the number of submissions, apart from overall time (see **Grace period** below). Only the last submission is retained.

If a team has elected to view one or more hints, a fee of around 10 to 20 points applies per hint. The fee is deducted from the *maximum available points*, not the points actually achieved. The effect of using hints is that the team's achievement is capped. If despite hints they don't quite finish the task they won't be penalised. A competitive team won't view hints unless they get stuck as they will want to maximise their score.

Points are converted to a net score by dividing by 100 and multiplying by two factors:

- The task absolute difficulty (1.0 to 9.9)
- A team scoring factor, currently 1.5 for Juniors, 1.2 for Intermediate and 1.0 for Senior teams.

For example, a task of difficulty 3.9 attempted by an Intermediate team who scored 90 points out of 100 but used a 20-point hint, would score

$$1.2 \times 3.9 \times \min(90, 100-20)/100 = 1.2 \times 3.9 \times 0.8 = 3.7$$

Scores are always rounded to 1 decimal place.



