

WeBWork Quizzes at HKUST

***A pilot scheme to run a proctored quiz in the
Math Support Center at HKUST***

Experience sharing

Jun LUO and Wing-lung LEE

**WeBWork and the Math Support Center Workshop
10-June-2014**

Background Information

Course concerned:

MATH 2111 Matrix Algebra and Applications (3 credits)

Student composition:

Mostly Year 2 Engineering students, as required course

Some Business Majors / Interdisciplinary Programs students

Enrolment:

**205 students, in two lecture sections
already using WeBWork for homework assignments**

Incentive:

Two quizzes, additional 3 marks to total score

Quiz Venue

Math Support Center

- Provide 20 workstations
- Less heavy usage before lunch time or after 6pm
- Schedule the quiz at three timeslots:
10:30am – 11:15am,
11:15am – 12:00nn, and
6:30pm – 7:15pm
- Quiz 1: spread over 5 days, 300 quota
- Quiz 2: spread over 4 days, 240 quota

Reservation of quiz timeslot

A tailor-made reservation system: first-come-first-serve

Online Reservation System - Math Support Center - Mozilla Firefox

檔案(F) 編輯(E) 檢視(V) 歷史(S) 書籤(B) 工具(T) 說明(H)

https://intranet.math.ust.hk/math.support.center/booking/

Online Reservation System - Math Su...

Online Reservation System - Math Support Center

Greeting! 1, Webwork Student!

Event: Gateway Quiz 1 for MATH2111 (4/7/2014 - 4/11/2014)

Accept Reservation from 3/24/2014 9:00:00 AM to 3/28/2014 6:00:00 PM

**** This event is closed ****

As of 4/2/2014 9:01:55 AM

7 Apr 2013	8 Apr 2013	9 Apr 2013	10 Apr 2013	11 Apr 2013
10:30 AM - 11:15 AM 14 stations are available	10:30 AM - 11:15 AM 16 stations are available	10:30 AM - 11:15 AM 16 stations are available	10:30 AM - 11:15 AM 14 stations are available	10:30 AM - 11:15 AM 18 stations are available
11:15 AM - 12:00 PM 15 stations are available	11:15 AM - 12:00 PM 16 stations are available	11:15 AM - 12:00 PM 9 stations are available	11:15 AM - 12:00 PM 5 stations are available	11:15 AM - 12:00 PM 1 station is available
6:30 PM - 7:15 PM 4 stations are available	6:30 PM - 7:15 PM No station is available	6:30 PM - 7:15 PM 6 stations are available	6:30 PM - 7:15 PM 7 stations are available	6:30 PM - 7:15 PM 13 stations are available

EN 9:01 2/4/2014

Event: Gateway Quiz 1 for MATH2111 (4/7/2014 - 4/11/2014)
Accept Reservation: from 3/24/2014 9:00:00 AM to 3/28/2014 6:00:00 PM

As of 4/2/2014 8:57:41 AM
Number of MATH2111 students without making reservation: 59

Number of booking: 146

Time	PC#	Name	ID	Email	Booking time	From IP	Del
4/7/2013 10:30:00 AM	3				3/28/2014 6:10:11 PM	119.246.127.244	<input type="button" value="del"/>
4/7/2013 10:30:00 AM	8				3/25/2014 4:43:04 PM	124.217.186.188	<input type="button" value="del"/>
4/7/2013 10:30:00 AM	13				3/27/2014 7:31:48 PM	143.89.231.17	<input type="button" value="del"/>
4/7/2013 10:30:00 AM	17				3/27/2014 10:17:08 PM	14.0.207.9	<input type="button" value="del"/>
4/7/2013 10:30:00 AM	18				3/26/2014 7:01:30 PM	143.89.78.34	<input type="button" value="del"/>
4/7/2013 10:30:00 AM	19				3/24/2014 9:00:07 AM	143.89.173.130	<input type="button" value="del"/>
4/7/2013 11:15:00 AM	4				3/27/2014 12:35:06 PM	143.89.106.251	<input type="button" value="del"/>
4/7/2013 11:15:00 AM	5				3/25/2014 4:32:05 PM	175.159.120.225	<input type="button" value="del"/>
4/7/2013 11:15:00 AM	7				3/24/2014 9:01:50 AM	175.159.110.194	<input type="button" value="del"/>
4/7/2013 11:15:00 AM	10				3/27/2014 6:22:26 PM	119.247.149.216	<input type="button" value="del"/>



Demo Quiz

[Email](#)
[File Manager](#)
[Course Configuration](#)
[Help](#) 
[Report bugs](#)

Opens

04/07/2014 at 10:25am HKT

Answers Due

04/11/2014 at 07:20pm HKT

Answers Available

04/11/2014 at 08:00pm HKT

Visible to Students

Yes ▾

Reduced Credit Enabled

No ▾

Restrict Access by IP

Restrict To ▾

Restrict Locations

Room_2612
 Room_3209A
 cook

Relax IP restrictions when?

After set answer date ▾

Assignment type

proctored gateway/quiz ▾

Proctored tests require proctor authorization to start and to grade. Provide a password to have a single password for all students to start a proctored test.

Password (Leave blank for regular proctoring)

Gateway parameters

Test Time Limit (min)

30

Cap Test Time at Set Due Date?

Yes ▾

Number of Graded Submissions per Test

1

Time Interval for New Test Versions (min; 0=infty)

0

Number of Tests per Time Interval (0=infty)

1

Order Problems Randomly

No ▾

Number of Problems per Page (0=all)

0



Logged in as wwstudent1.

[Log Out](#)

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webwork → 2014_SPRING_MATH2111

2014_SPRING_MATH2111

Homework Sets

<u>Name</u>	Test Score	Test Date	<u>Status</u>
Take DemoQuiz test			now open, due 04/28/2014 at 06:00pm HKT
Quiz-1 test			will open on 04/07/2014 at 10:25am HKT
DemoQuiz (test 1)	0.666666686534882/2	Fri Mar 21 10:26:49 2014	completed.
DemoQuiz (test 2)	0.333333343267441/2	Wed Apr 2 09:11:16 2014	completed.

[Clear](#)

Course Info

MATH 2111 Matrix Algebra and Applications Spring 2013-14

This is an introductory course to linear algebra. Key concepts include systems of linear equations, vectors, matrices, determinants, vector spaces and linear transformations, eigenvalues and eigenvectors, matrix diagonalization, inner product and orthogonal projections, symmetric matrices and quadratic forms.

Assessment

Online Homework (WeBWork): 10%
Midterm Exam: 30%
Final Exam: 60%

Textbook

David C. Lay, *Linear Algebra And Its Applications* (4th ed), Pearson.

Lectures and Instructors

- [Dr. Wong, Ka-Yue Daniel](#) (Office: Rm 3472)
- [L2 webpage](#)
- Phone: 2358-7439
 - L2: MW 12:00-13:20 Rm 4620
- [Dr. Lee, Wing Lung](#) (Office: Rm 3435)





Logged in as wwstudent1.

[Log Out](#)

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Proctored Gateway Quiz DemoQuiz

Proctor authorization required.

User's username is: wwstudent1

User's name is: **Trial account**

Proctor username:

Proctor password:

Page generated at 04/02/2014 at 09:18am HKT / Dept of Math

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EN



9:18
2/4/2014

[Student Progress](#)
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- ☐ Sort by , then by , then by .
☐ Edit .
☐ Import users from file replacing existing users and adding new users
☐ Export to a new file named: .lst
☐ Add student(s).
☐ Delete *Deletion destroys all user-related data and is not undoable!*

Showing 7 out of 246 users.

Select	Login Name	Login Status	Assigned Sets	First Name	Last Name	Email Address	Student ID	Status	Section	Recitation	Comment	Permission Level
<input type="checkbox"/>	cramer	inactive	0/9	1	Proctor			Drop (D)		proctor		grade_proctor
<input type="checkbox"/>	schwarz	inactive	0/9	2	Proctor			Drop (D)		proctor		grade_proctor
<input type="checkbox"/>	cauchy	inactive	0/9	3	Proctor			Drop (D)		proctor		grade_proctor
<input type="checkbox"/>	laplace	inactive	0/9	4	Proctor			Drop (D)		proctor		grade_proctor
<input type="checkbox"/>	cayley	inactive	0/9	5	Proctor			Drop (D)		proctor		grade_proctor
<input type="checkbox"/>	jordan	inactive	0/9	6	Proctor			Drop (D)		proctor		grade_proctor
<input type="checkbox"/>	gauss	inactive	0/9	reserve	Proctor			Drop (D)		proctor		grade_proctor

Page generated at 04/02/2014 at 09:10am HKT / Dept of Math

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Logged in as wwstudent1.
[Log Out](#)

home → 2014_spring_math2111 → DemoQuiz

Proctored Gateway Quiz DemoQuiz

The selected problem set (DemoQuiz) is not a valid set for wwstudent1:

Client ip address 143.89.17.61 is not in the list of addresses from which this assignment may be worked.

Page generated at 04/02/2014 at 09:24am HKT

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Logged in as wwstudent1.

[Log Out](#)

home → 2014_spring_math2111 → DemoQuiz

Remaining time: 04:56 (min:sec)

Proctored Gateway Quiz DemoQuiz

Jump to: Problem [[1](#) [2](#)]

Problem 1. (1 point)

(1 pt)

The expression $(4x - 7)(3x + 10)$ equals x^2 + x +

Note: You can earn partial credit on this problem.

[preview problems](#)

Problem 2. (1 point)

(1 pt)

Solve the equation $\frac{1}{2}y - 9 = \frac{1}{10}y$.

$y =$



(1 pt)

The expression $(4x - 7)(3x + 10)$ equals $x^2 +$ $x +$

Remaining time: 04:15 (min:sec)

Note: You can earn partial credit on this problem.

[preview problems](#)**Problem 2.** (1 point)

(1 pt)

Solve the equation $\frac{1}{2}y - 9 = \frac{1}{10}y$.

$y =$

[preview problems](#)

Jump to: Problem [[1](#) [2](#)]

[Preview Test](#)[Grade Test](#)



Logged in as wwstudent1.
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[Proctored Gateway Quiz DemoQuiz,v3](#)

Proctor authorization required.

Grading assignment:

Submission time: Wed Apr 2 09:22:15 2014

Due: Wed Apr 2 09:26:04 2014

User's username is: wwstudent1

User's name is: Trial account

Proctor username:

Proctor password:

Page generated at 04/02/2014 at 09:22am HKT / Dept of Math

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EN



9:21
2/4/2014



WeBWork

Logged in as wwstudent1.

[Log Out](#)

home → 2014_spring_math2111 → DemoQuiz,v3

Proctored Gateway Quiz DemoQuiz,v3

Your score on this test (3) WAS recorded.

Your score on this test is 1/2.

Time taken on test: 1.58 min (5 min allowed).

Completed results for this assignment are not available until 05/02/2014 at 09:26am HKT.

Page generated at 04/02/2014 at 09:22am HKT

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EN



9:22

2/4/2014



Proctoring the Gateway Quiz

Invigilator

- **2 instructional assistants (IAs)**

Venue

- **Math Support Center (MSC)**

Capacity

- **20 students**

Process

Preparation

- IAs get a name list, a proctor username & password
- IAs Make sure all students leave the MSC before a quiz
- Computer officer turn off all the internet accesses except the WeBWork in the MSC 10 minutes before the quiz.
- IAs check if all computers work well

Check - in

- **One IA checks the students' HKUST cards at the entrance and tells them their workstation numbers.**
- **Students scan their students' HKUST cards at the entrance**
- **The other IA leads them to seat at the right workstation and assists them to log on to the WeBWork.**

During the quiz

- **IA announces the rules and steps of taking the quiz**
- **IA writes the proctor username & password on the whiteboard. The quiz starts.**
- **IAs go around during the quiz to remind the students to save their work in time or submit the quiz on time**

Check - out

- **When the students submit their quizzes, they should log off the WeBWork and the computers, scan their students' cards again before they leave**

After the quiz

- **Computer officer turn on the internet access after the quiz and before the opening hours of the MSC**

Problems encountered

Auto-logout problem

- some students met auto-logout issue, scores not recorded

Time-out problem

- Reminder windows pop-up at the last 90 seconds and the last 45 seconds
- The pop-up windows freeze the count-down clock
- Some students did not realize that they were out of time already
- 6 students met this problem, scores not recorded



Logged in as wwstudent1.

[Log Out](#)

Remaining time: 01:30 (min:sec)

home → 2014_spring_math2111 → DemoQuiz

Proctored Gateway Quiz DemoQuiz

Jump to: Problem [[1](#) [2](#)]

Problem 1. (1 point)

(1 pt)

The expression $(2x - 10)(8x + 5)$ equals [input field]

確定

* You only have less than 90 sec left to complete *
* this assignment. You should finish it very soon! *

Note: *You can earn partial credit on this problem.*

[preview problems](#)

Problem 2. (1 point)

(1 pt)

Solve the equation $\frac{1}{4}y + 8 = \frac{1}{5}y$.

$y =$



EN



11:02

8/4/2014



Logged in as wwstudent1.

[Log Out](#)

home → 2014_spring_math2111 → DemoQuiz

Remaining time: 00:43 (min:sec)

Proctored Gateway Quiz DemoQuiz

Jump to: Problem [[1](#) [2](#)]

Problem 1. (1 point)

(1 pt)

The expression $(2x - 3)(2x + 4)$ equals $4x^2 + \text{ } x + \text{ } - 12$

確定

Note: *You can earn partial credit on this problem.*[preview problems](#)

Problem 2. (1 point)

(1 pt)

Solve the equation $\frac{1}{3}y - 10 = \frac{1}{8}y$. $y =$ 



Logged in as wwstudent1.

[Log Out](#)

Remaining time: 00:00 (min:sec)

home → 2014_spring_math2111 → DemoQuiz

Proctored Gateway Quiz DemoQuiz

Jump to: Problem [[1](#) [2](#)]

Problem 1. (1 point)

(1 pt)

The expression $(2x - 3)(2x + 4)$ equals $4x^2 + \text{[input]}x + -12$

Note: *You can earn partial credit on this problem.*

[preview problems](#)

Problem 2. (1 point)

(1 pt)

Solve the equation $\frac{1}{3}y - 10 = \frac{1}{8}y$.

$y =$

* You are out of time! *
* Press grade now! *

確定





Logged in as wwstudent1.

[Log Out](#)

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[Proctored Gateway Quiz DemoQuiz,v8](#)

Proctor authorization required.

Grading assignment:

Submission time: Tue Apr 8 11:13:31 2014

Due: Tue Apr 8 11:10:56 2014

The time limit on this assignment was exceeded. The assignment may be checked, but the result will not be counted.

User's username is: wwstudent1

User's name is: Trial account

Proctor username:

Proctor password:

Page generated at 04/08/2014 at 11:13am HKT / Dept of Math

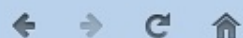
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EN



11:13
8/4/2014



WeBWorK

Logged in as wwstudent1.
[Log Out](#)

home → 2014_spring_math2111 → DemoQuiz,v8

Proctored Gateway Quiz DemoQuiz,v8

Your score on this test (8) was NOT recorded. Your score was not recorded because you have exceeded the time limit for this test. (Time taken: 5.18 min; allowed: 2 min.)

Time taken on test: 5.18 min (2 min allowed).

Completed results for this assignment are not available until 04/08/2014 at 11:20am HKT.

Page generated at 04/08/2014 at 11:14am HKT

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Modified Policy for Quiz 2

Time-out problem

- Assign 5 more minutes to quiz time (announced before the quiz that the count-down clock will show 5 more minutes than it is used to be)
- Scores still recorded even time-out for 5 minutes

Multiple submission

- Students can submit answers for grading twice

Stronger incentive

- Use maximum score of two quizzes to calculate the additional points

The background image shows a large, modern, multi-story building with a curved facade and many windows. In the foreground, there is a large, red, abstract sculpture that resembles a stylized flame or a flower. The sculpture is mounted on a circular base. The overall scene is brightly lit, suggesting a sunny day.

Some Data of the Quizzes

Quiz 1

Some Data for Quiz 1:

- **Reservation open from 24-Mar-2014 9am to 28-Mar-2014 6pm**
- **Quiz time from 7-Apr-2014 to 11-Apr-2014 (5 days)**
- **Registered students: 146 students, ~71.2%**
- **Only using 48.6% of the capacity (300)**
- **Present: 118 students, ~80.8% of registered**
- **109 students completed successfully, scoring an average of 4.4/6**

Quiz 2

Some Data for Quiz 2:

- Reservation open from 28-Apr-2014 9am to 2-May-2014 12noon
- Quiz time from 5-May-2014 to 9-May-2014 (4 days)
- Registered students: 118 students, ~57.6%
- Only using 49.2% of the capacity (240)
- Present: 91 students, ~77.1% of registered
- 90 students completed successfully, scoring an average of 3.8/6

... stronger incentive seems not working very well...

Appendix

Effect of quiz scores to final grades

Old grade	New grade	No. of students		Old grade	New grade	No. of students
A	A+	3		C+	B-	1
A-	A	4		C	C+	5
B+	A-	10		C-	C	6
B	B+	10		D	C-	2
B-	B	6		F	D	1

48 students (out of 128) have their grades improved.

Adding 3 points to final score is very significant!