

MacQTEX

Randomized Quiz System

Ross Moore & Frances Griffin

*Mathematics Department
Macquarie University, Sydney*



Mathematics Quizzes

At Macquarie University the Mathematics Department has been developing¹ a web-based system for producing quizzes which allow students to test their knowledge of mathematical ideas required in the courses that we teach. Currently these quizzes are used mainly at the most elementary level, for revision of the basic skills which the students should have acquired from mathematics courses at high school.

□ Examples

- **Basic Math Skills:** [MATH130, examples](#)
- **Discrete Math Quizzes, with answers:** [MATH237](#)

¹This project has received funding via a ‘Targeted Flagship Grant’ from the Center for Flexible Learning, Macquarie University, and the Division of Information and Communication Sciences, Macquarie University as well as an equipment grant from Apple Computer, Australia Pty Ltd, via the Apple Universities Consortium.

MATH130 Quizzes - DE1 2001

Assumed Knowledge Quizzes and Practice Quizzes

Quizzes require your web browser to have the Acrobat Reader software, version 4.0 or 4.05. **Version 5.0, does not support the quizzes**, so if you have installed this, then you should do the quizzes on campus (see below), rather than trying to reinstall an older version of Acrobat. Acrobat 4.05 can be downloaded for free from [Adobe's site](#). Get the browser plug-in, and follow the instructions provided to install it.

It is important to have the Acrobat Reader installed so that it runs inside the browser window. If not, you may still be able to do the quiz, but your results will not be recorded - Acrobat needs the browser to do this. If a new window opens with the quiz in it, then Acrobat is not running inside your browser. Here are some [instructions](#) if you need them.

Note that this may require your computer to have a recent operating system; Win'95, Win'98, Windows NT (v.4) or later should be sufficient, or MacOS 7.6 or later for Macintosh systems.
16+ MByte RAM may be enough, but more is preferable.

You are required to complete the first three quizzes, getting full marks. You may try as many times as you like, the quiz will be different each time, and your results for each attempt will be recorded.

The Practice quizzes are not compulsory, but are recommended if you are having difficulty with the compulsory quizzes.

Select a quiz.

Enter your Student number, or other identifying string, then choose your quiz and hit the button:

Student ID:

Name:

Compulsory Quizzes

- Basic Skills Quiz 1
- Basic Skills Quiz 2
- Basic Skills Quiz 3

Practice Quizzes

- Fractions
- Manipulating Expressions
- Indices and Logarithms
- Geometry and Functions

Training not Testing

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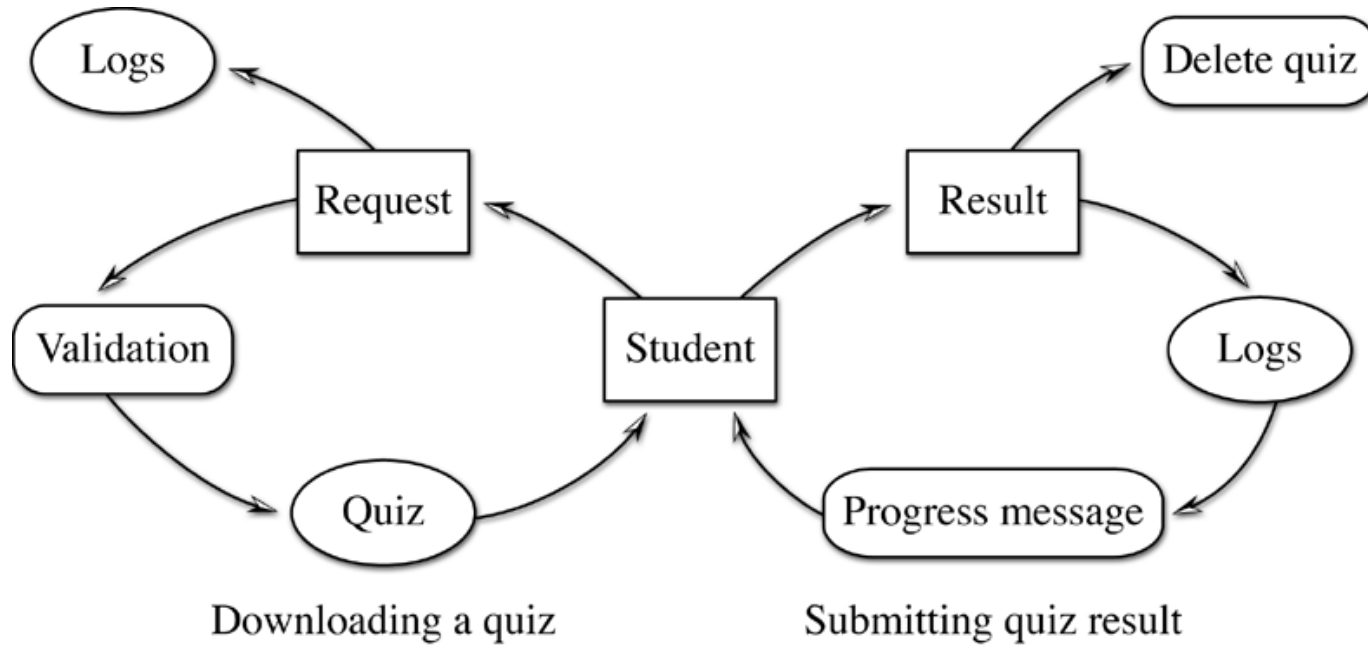
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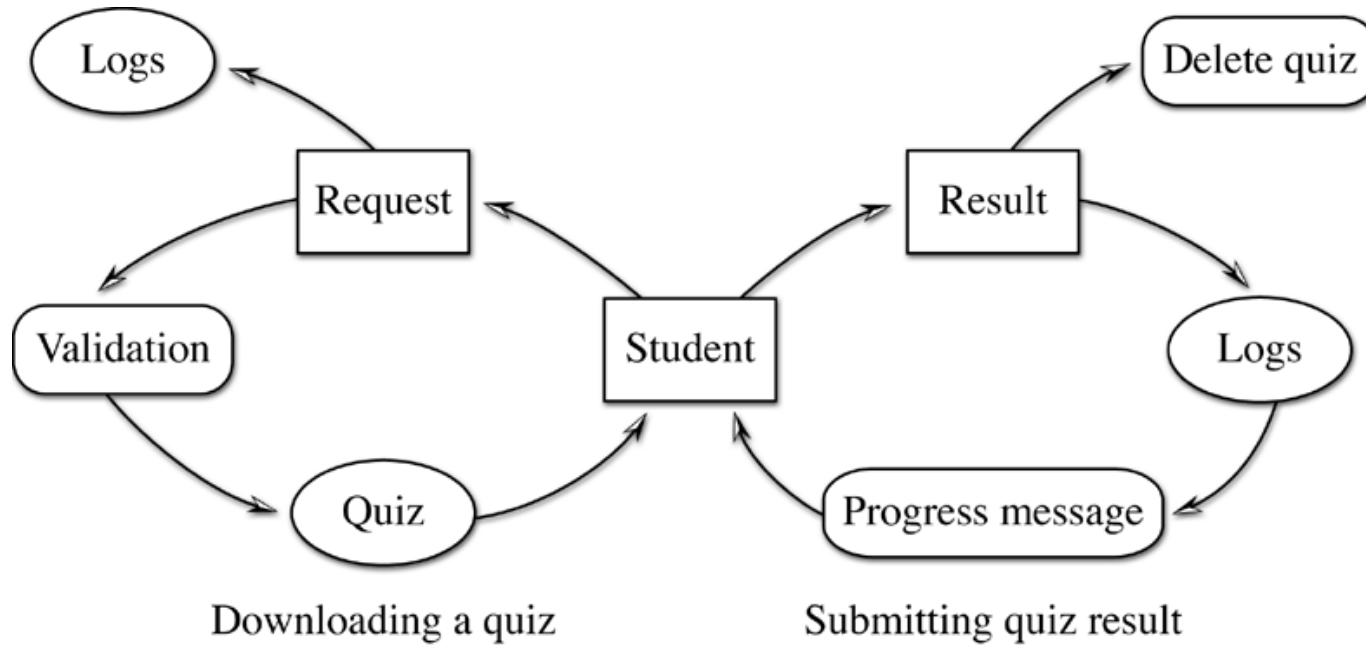
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The quizzes can be used by students to **identify for themselves** where they are weak and may need to seek the extra help that *can* be provided.

Student Interaction

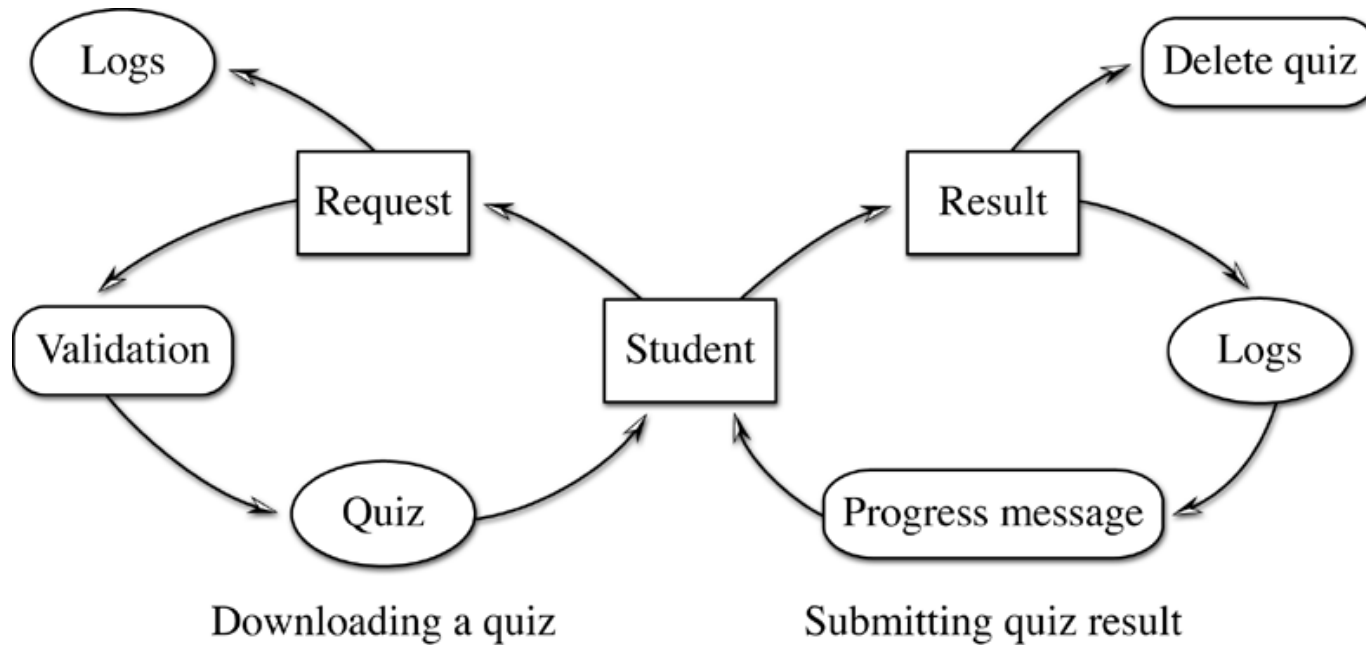


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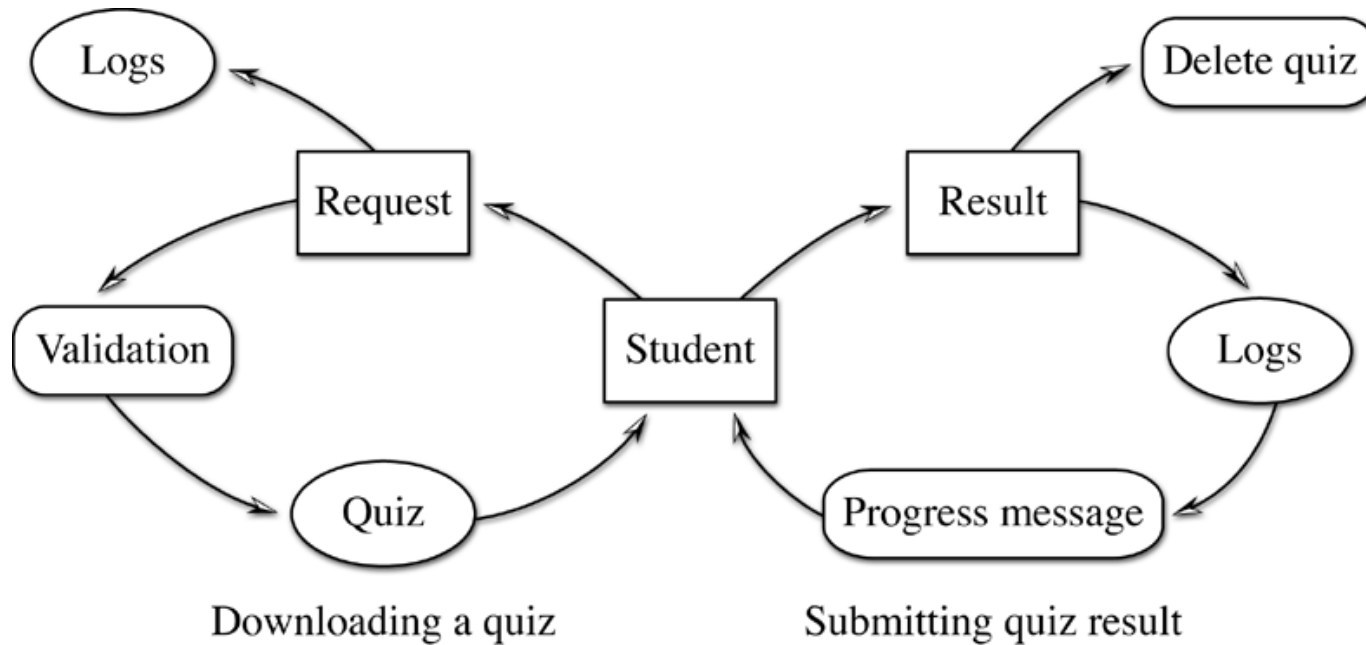
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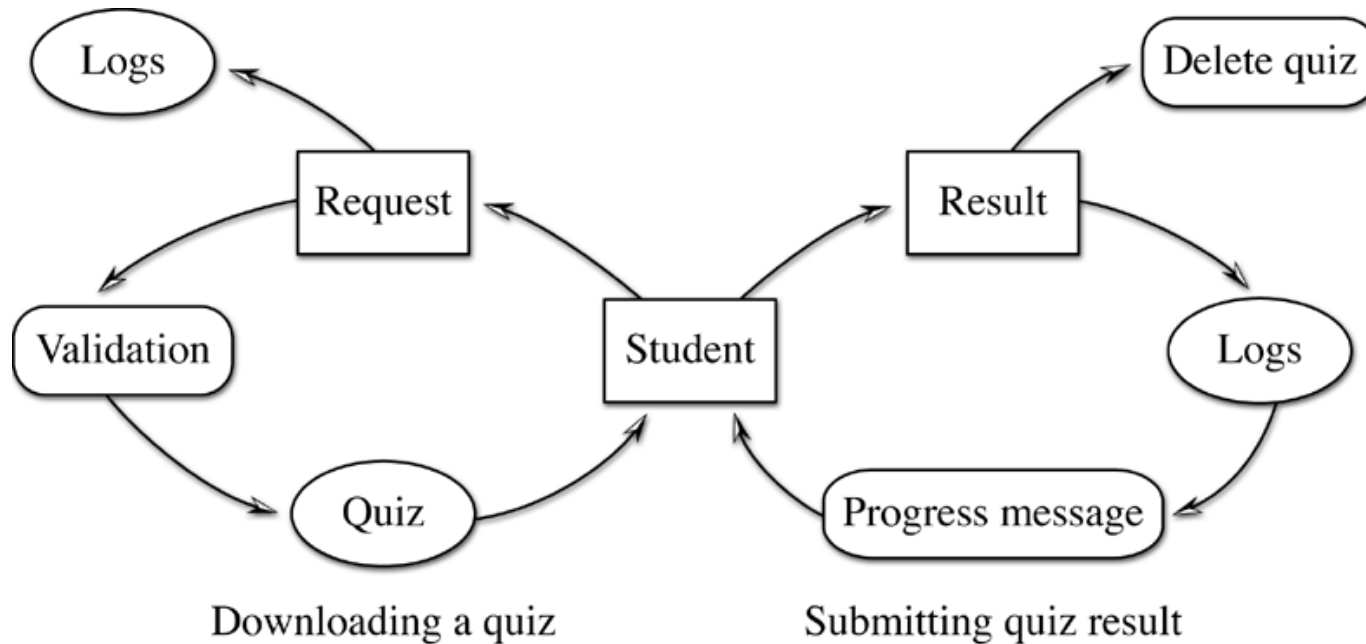
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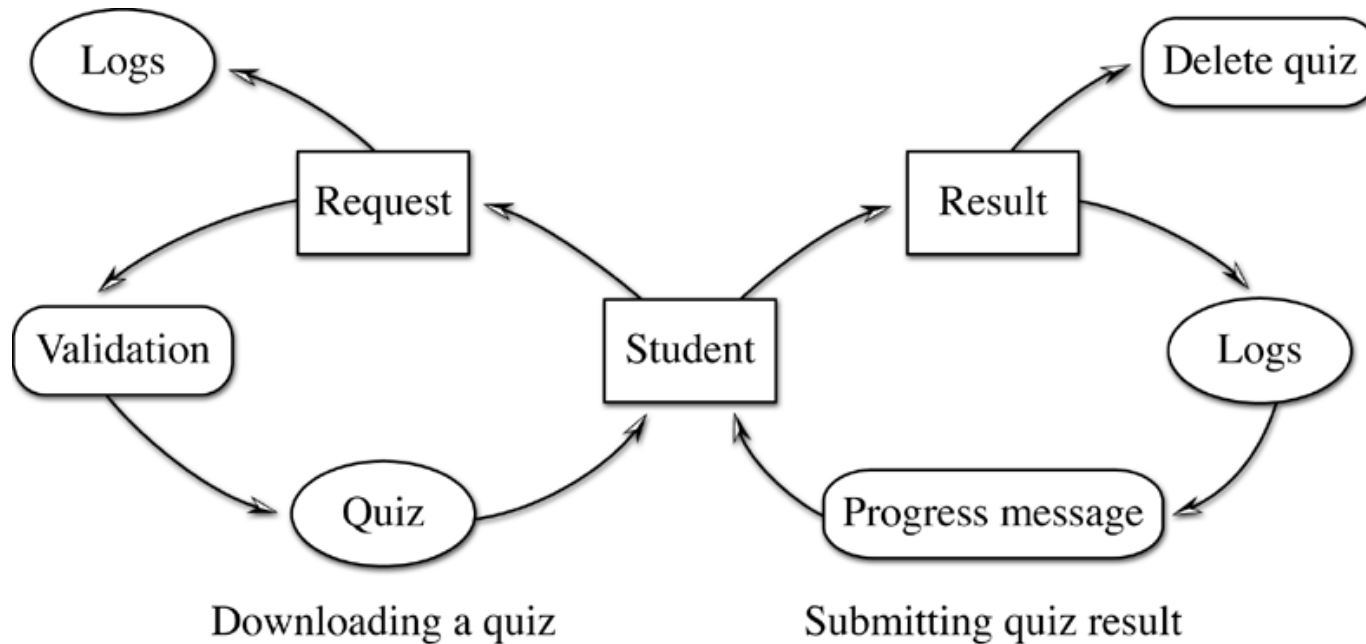
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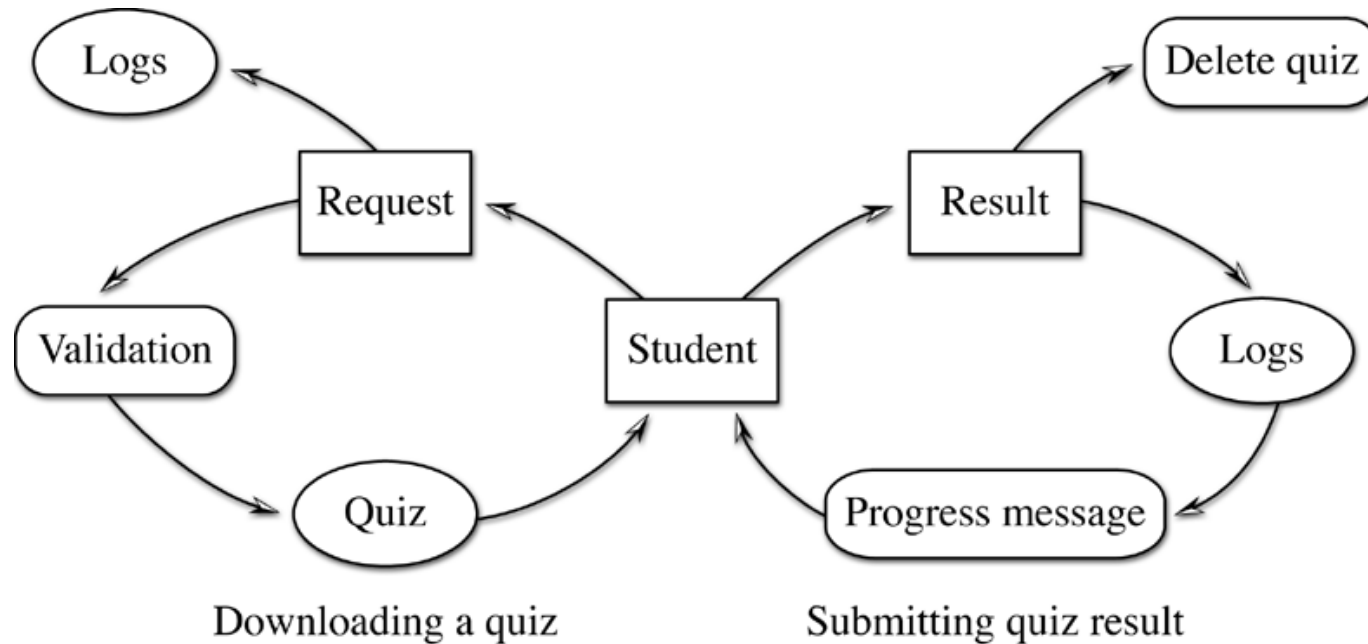
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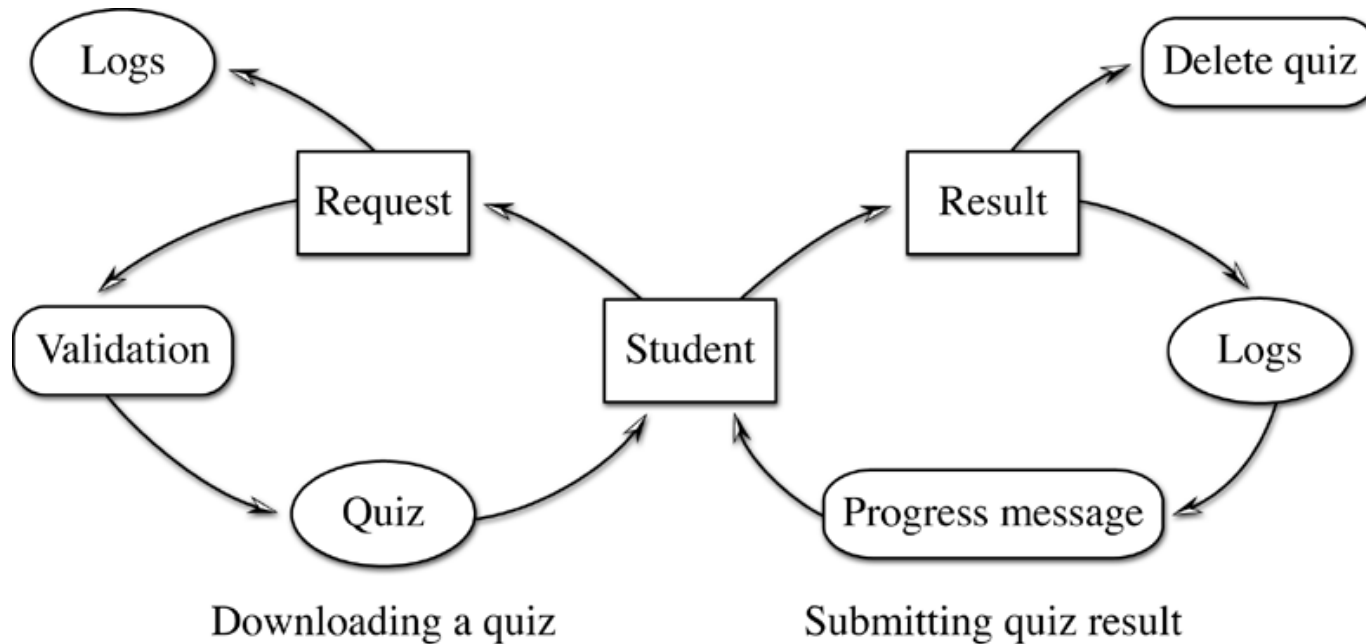
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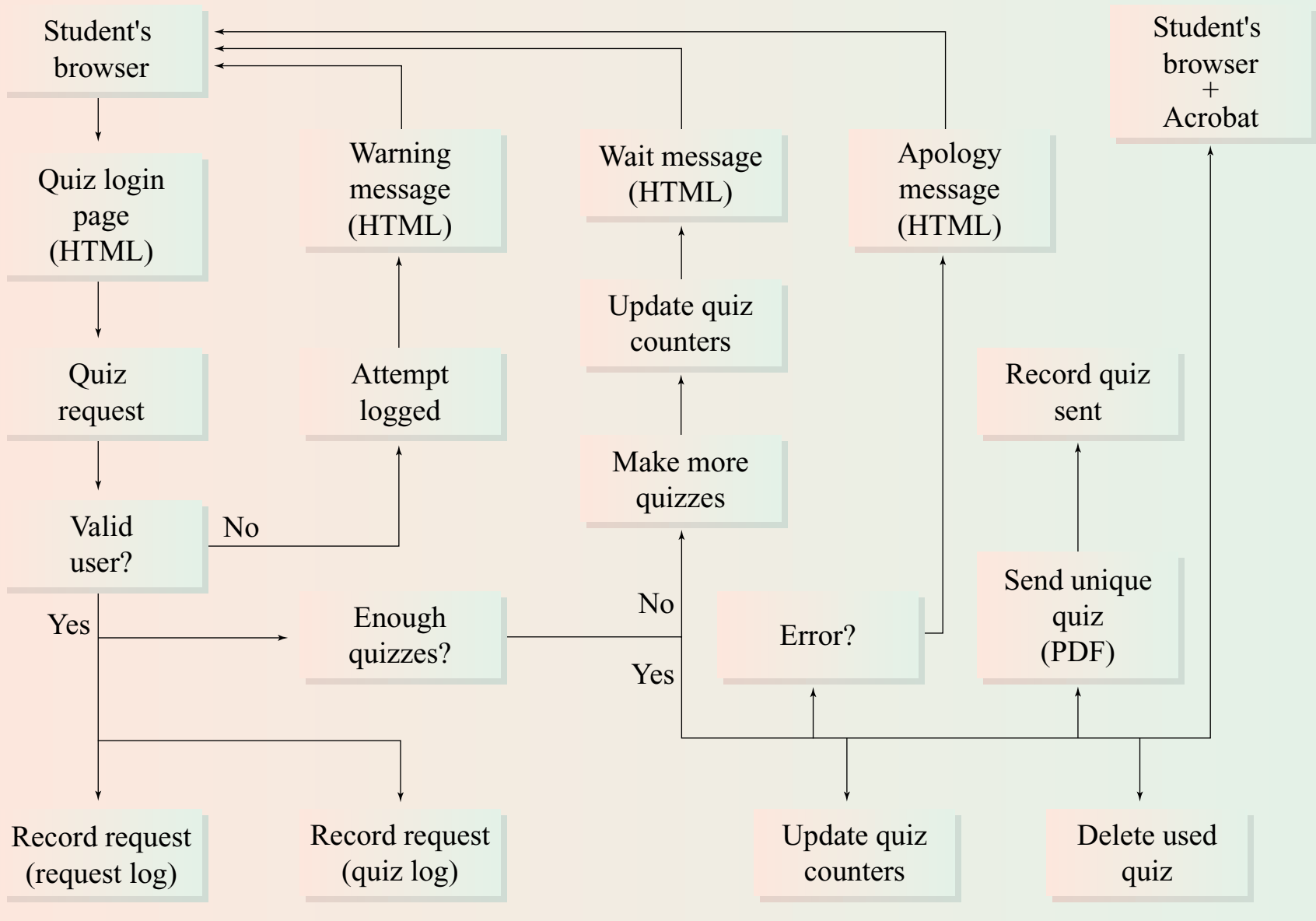


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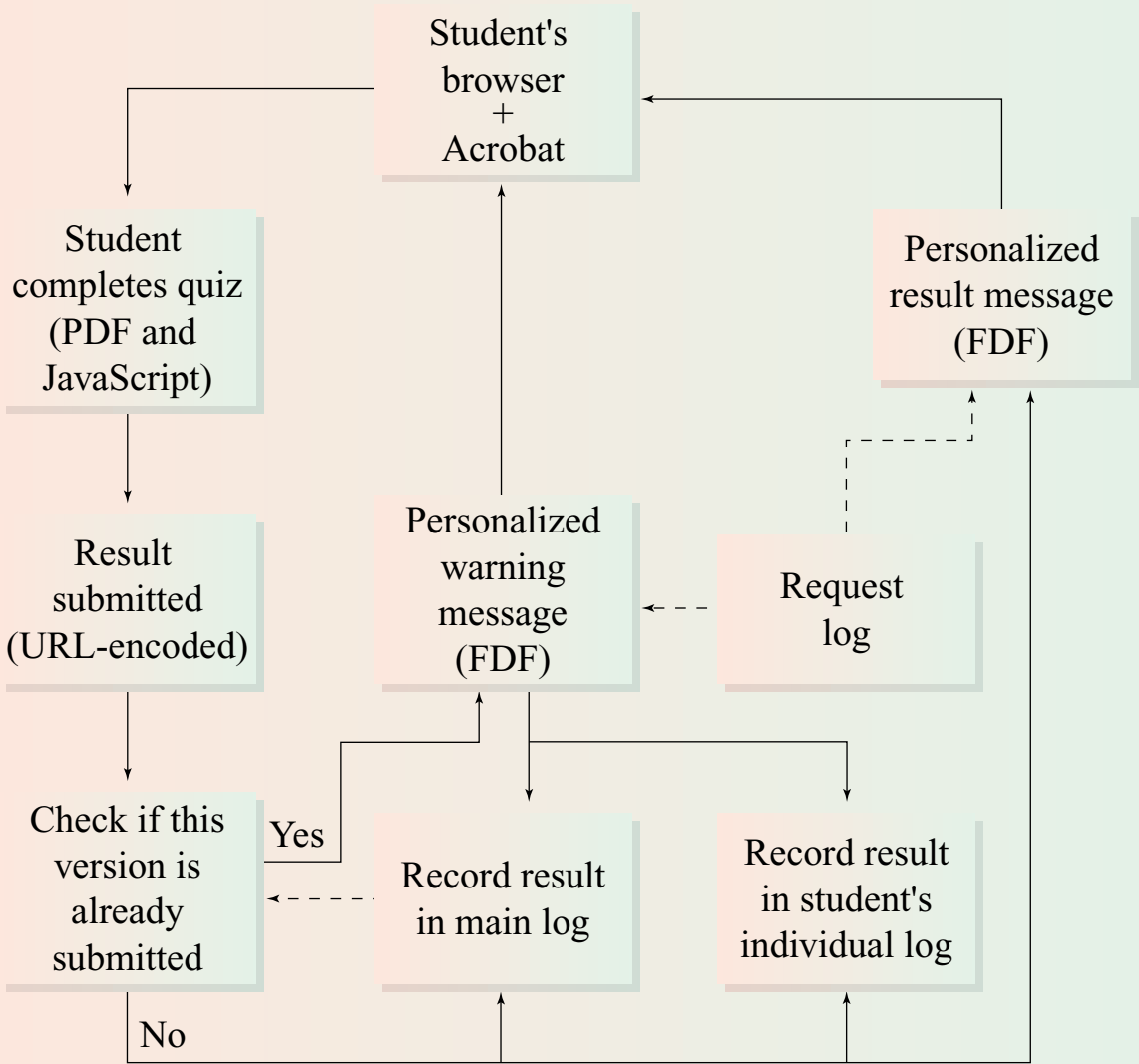
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- After completing the quiz, submitted results are recorded in the student's log and in the overall quiz log. A personalized message concerning the student's progress is returned as FDF data. This appears in a form field at the end of the PDF quiz document.



Sending a quiz to the student's browser



Recording results from a quiz

Each Quiz can be Different

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- One way uses the *Mathematica*² software [11] to generate the exact contents of each question and its worked solution.

²*Mathematica* is a trademark of Wolfram Research Limited.[11]

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- Randomness applies to order of answer choices.
- Repeat the same quiz as many times as necessary, to achieve a 100% score.
- Students cannot ‘cheat’ by presuming, for example, that the correct answer to question 5 will always be ‘b’.

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Evaluating Student Progress

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This page allows access to:

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- **as formatted HTML tables or raw text form.**



Location: <http://www.maths.mq.edu.au/cgi-bin/playground/quizManager.pl>



Staff Login

Login name:

Choose a task

- Make a new quiz
- Edit an existing quiz
- Recreate a used quiz
- Create login page
- View student logs
- Clean up directories

Go!

Look at these

[Question catalogue](#)

[Sample student login](#)

Student logs

When a student requests a quiz, the request is recorded in a number of log files, including one for that student. When the student completes the quiz and submits the result, this is also recorded in these logs.

Sometimes things go wrong with the connection, the browser or acrobat, and the results don't come back to the server. In this case only the request can be recorded, but no results.

You can look at a student's individual results, in a nice table or as a raw log file. You can also look at a nice table of collated results for the class, showing which students have attempted the quizzes, which ones they have got full marks for and the number of attempts for each quiz.

Other logs you might want to look at for maintenance purposes, or just for sticky-beaking, include the logs for each quiz, the bad logins (from unauthorized users) and the main activity log (big!!)

Student logs

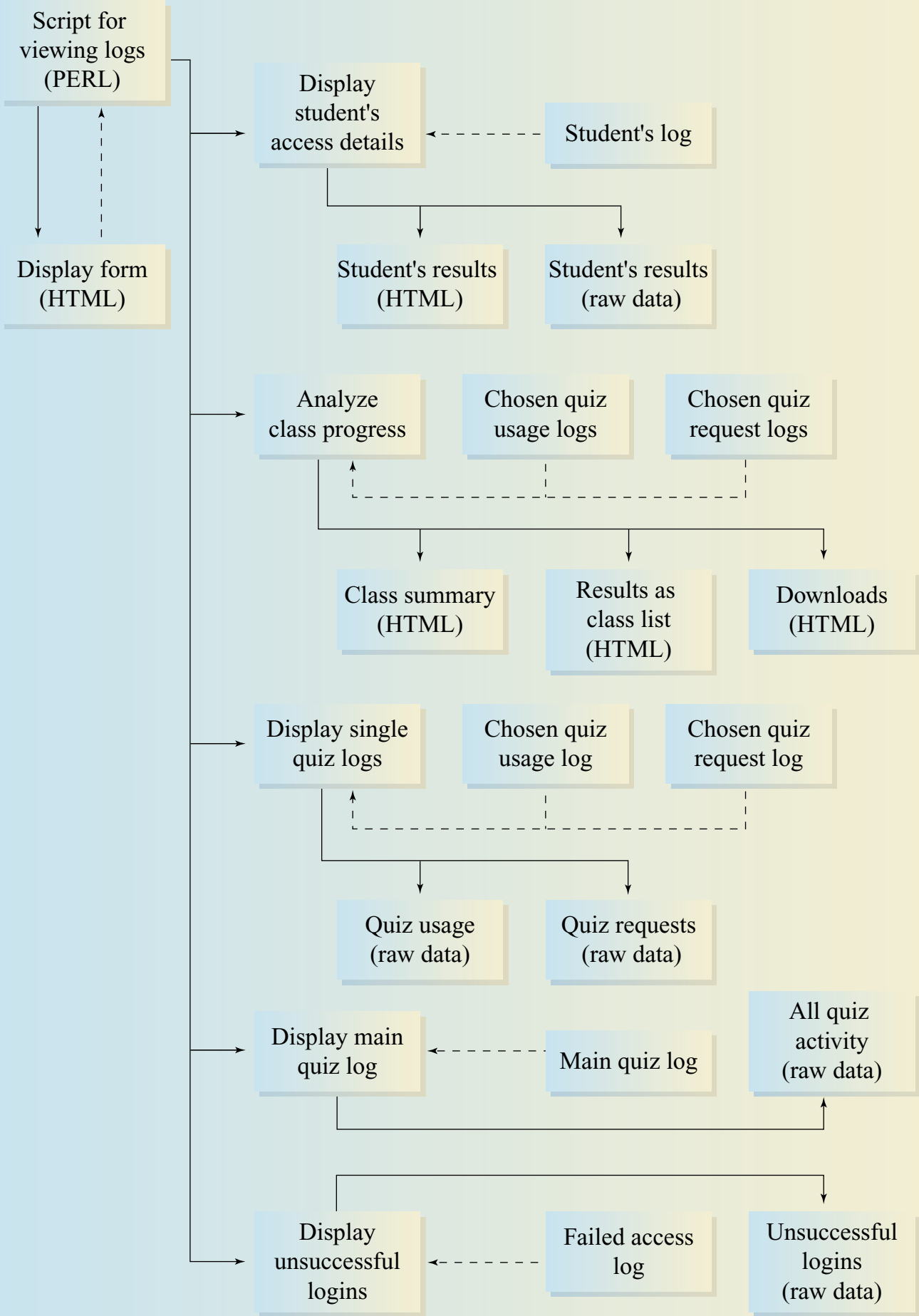
Student number:

- Student's quiz results
- Student's full log file

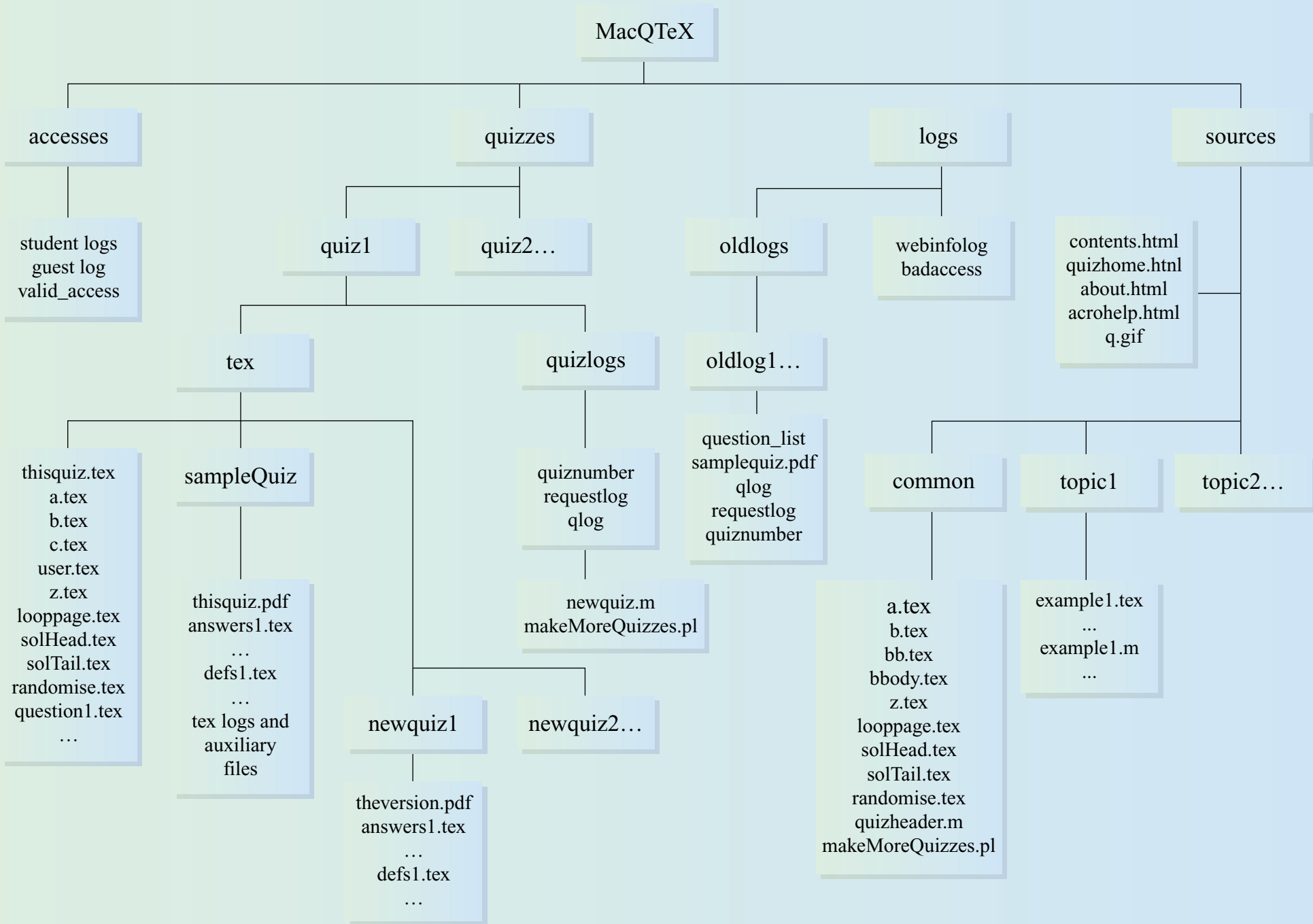
Class logs

- Class summary - successes, attempts, download attempts, average tries etc
- Class results - each student's success and number of attempts
- Downloads - lists all students who have downloaded a quiz

- MATH130Fran27340
- MATH130Fran7257
- MATH130practice1
- MATH130practice2
- MATH130practice3
- MATH130practice4
- MATH130quiz1
- MATH130quiz2
- MATH130quiz3



Viewing quiz logs and student logs



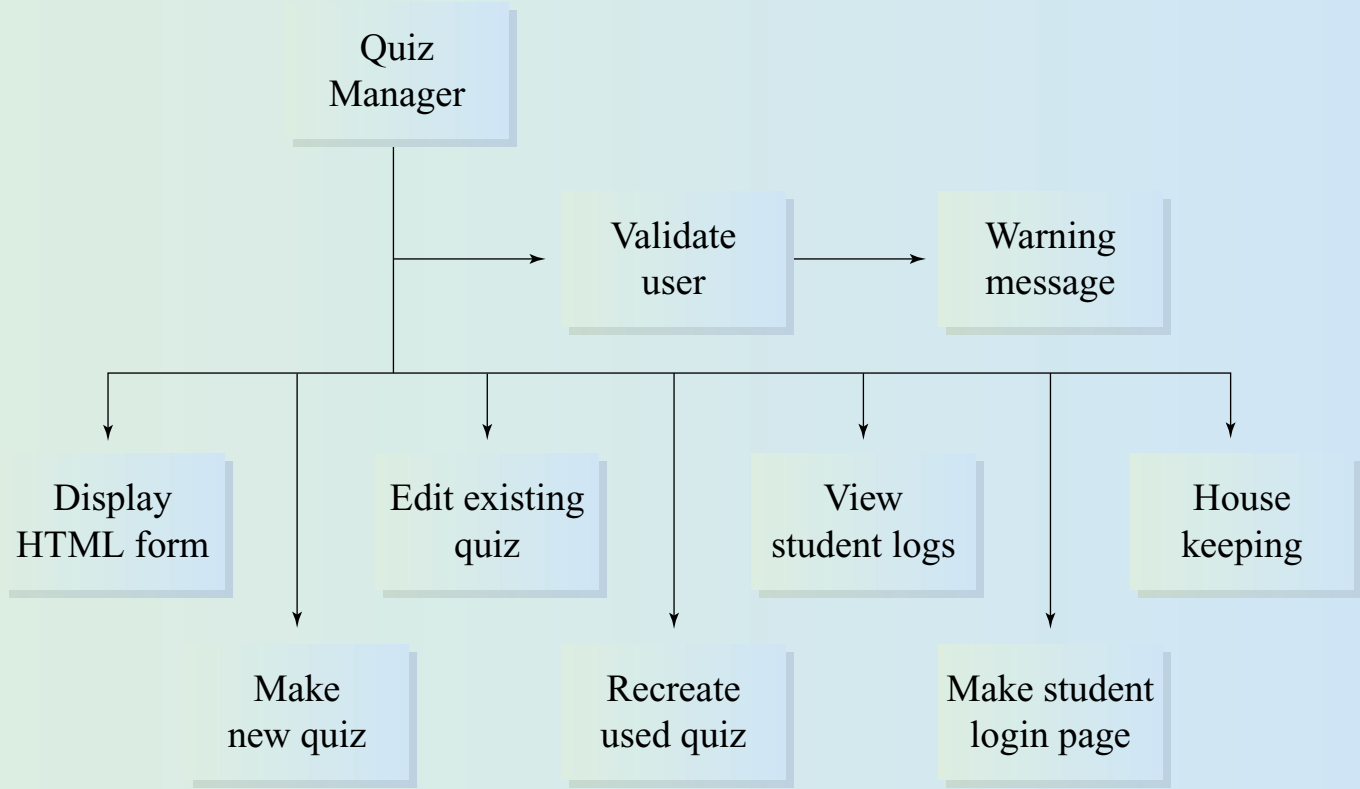
Directory structure of MacQ_TE_X quiz system

Quiz Management

All management aspects of the MacQTEX quiz system are handled from the staff/instructor [interface page](#).

This page provides access to allow the following tasks:

- **design a new Quiz**
- **edit/modify an existing Quiz**
- **recover already used Quiz instances**
- **view student log-files**
- **make a login page for student access**
- **general house-keeping duties**



Overview of MacQT_EX quiz building system

Designing a Quiz

Also accessible from the staff/instructor [interface page](#) is the interface for creating new quizzes.

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Also accessible from the staff/instructor [interface page](#) is the interface for creating new quizzes.

- **choose up to 12 questions for a quiz;**
- **from 14 areas of basic mathematics;**
- **up to 6 types of question in each area;**

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- **choose up to 12 questions for a quiz;**
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This is only the first step in the process of creating quiz instances to be available for student use. All the files resulting from these choices may be edited.



Location: <http://www.maths.mq.edu.au/cgi-bin/playground/quizManager.pl>

What's Related

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[Question catalogue](#)

[Sample student login](#)

Quiz title, eg MATH130 Assumed Knowledge:

Quiz topic, eg Basic Skills 1:

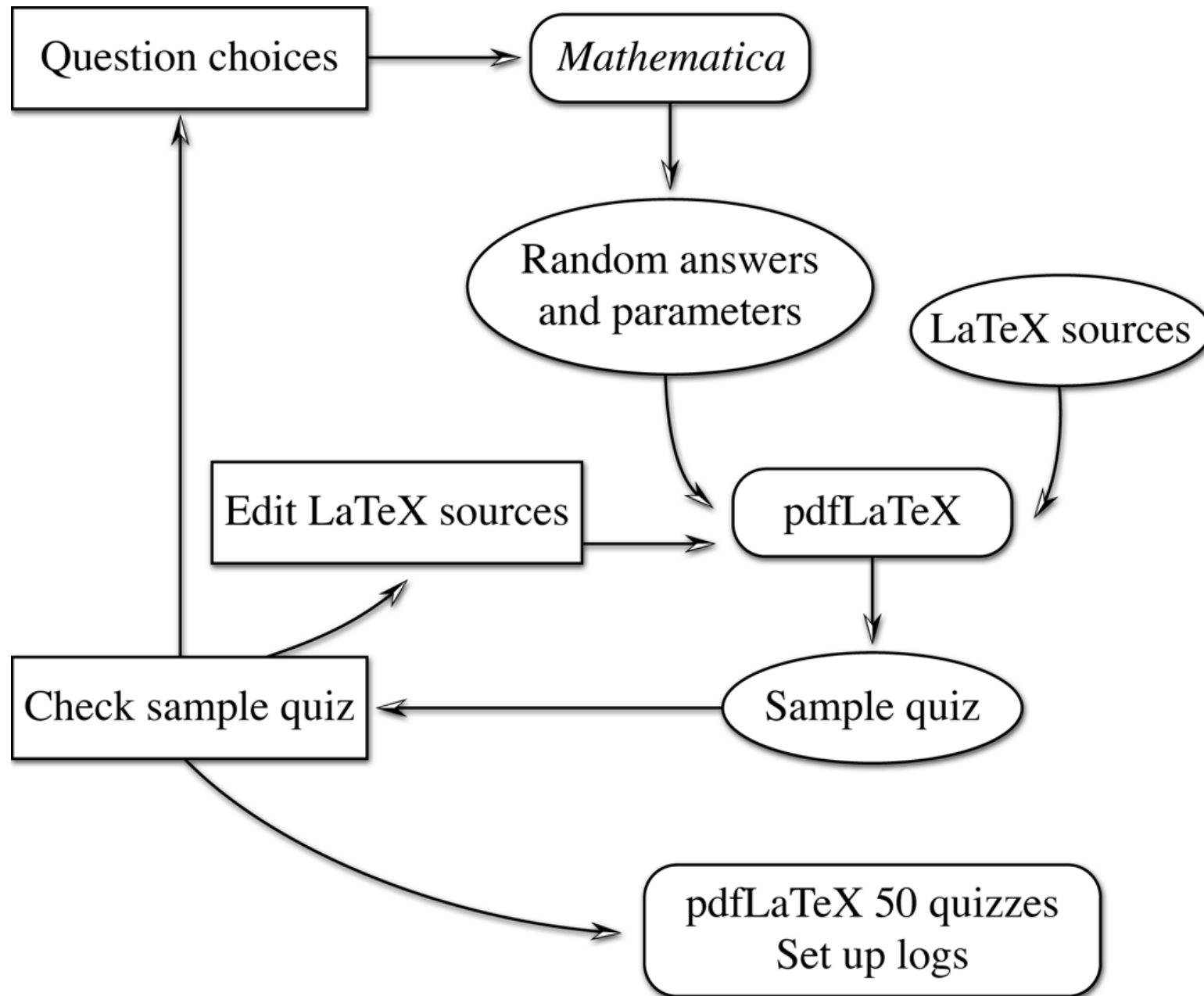
Name on disk, eg MATH130quiz1 (no spaces or punctuation please):

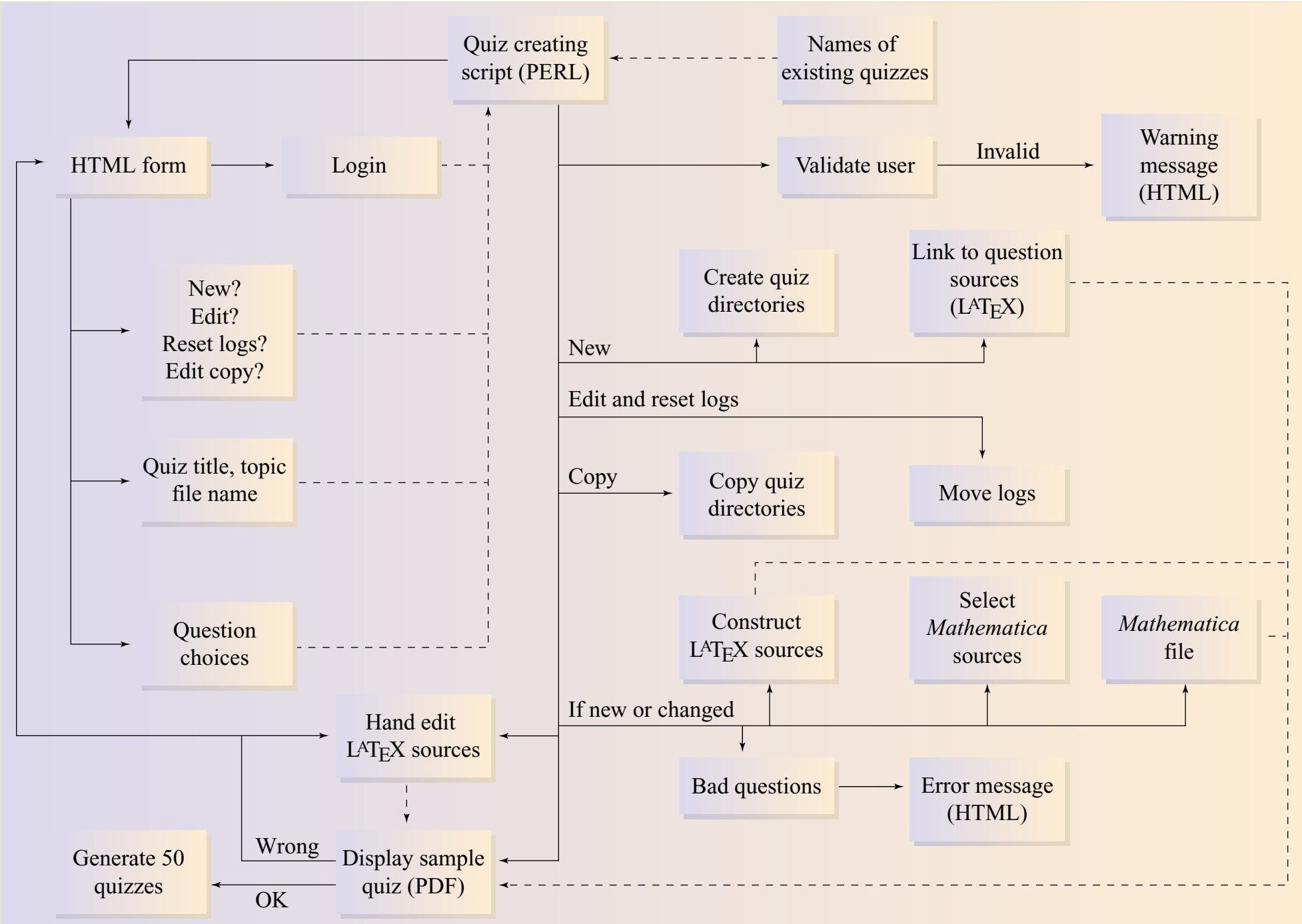
Choose the questions

- A standard quiz

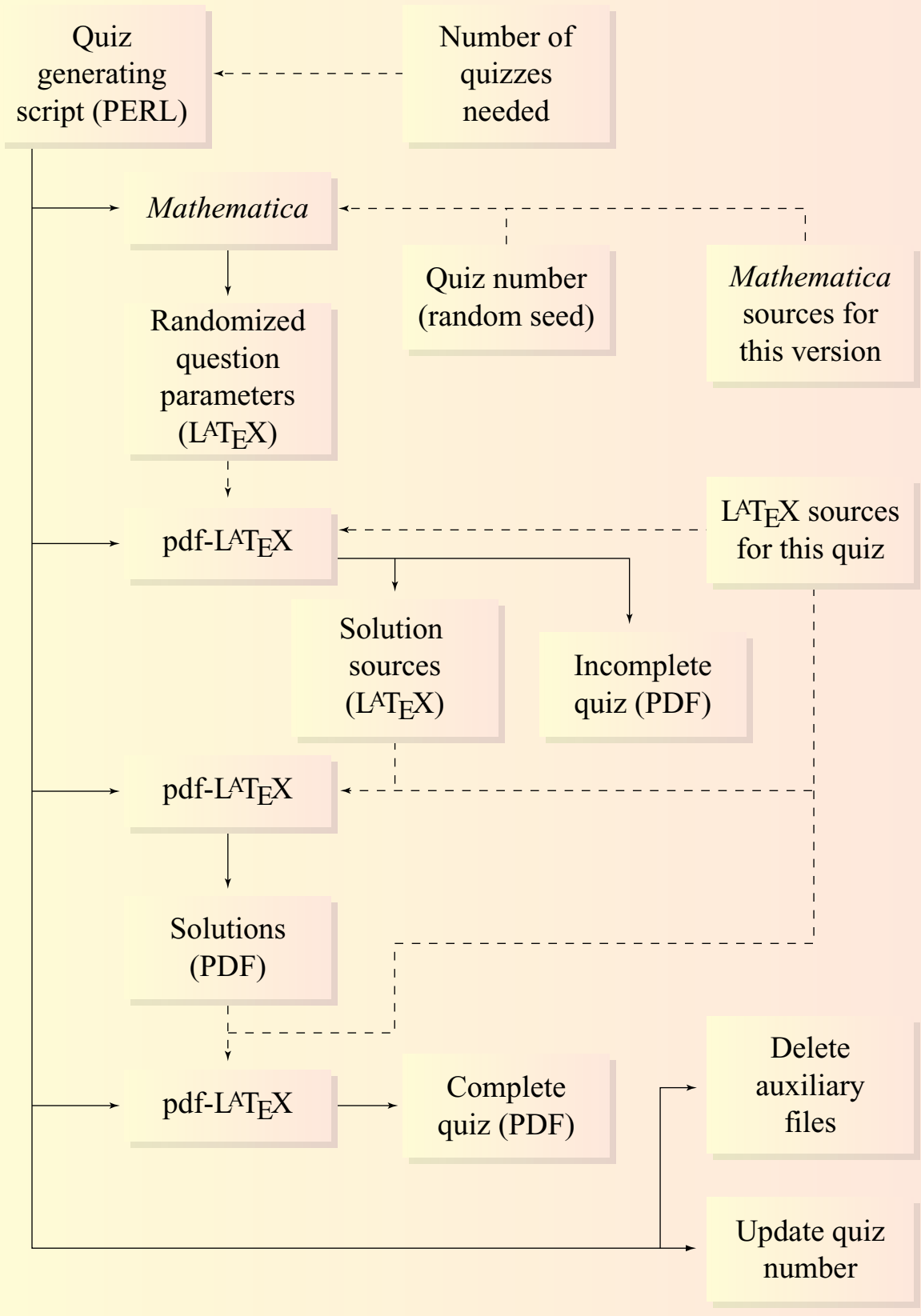
	Topic	Example
Question 1	<input type="text" value="absolute value"/>	<input type="text" value="1"/>
Question 2	<input type="text" value="equation solving"/>	<input type="text" value="3"/>
Question 3	<input type="text" value="factorization"/>	<input type="text" value="2"/>
Question 4	<input type="text" value="fractions"/>	<input type="text" value="4"/>
Question 5	<input type="text" value="functions"/>	<input type="text" value="1"/>
Question 6	<input type="text" value="geometry"/>	<input type="text" value="1"/>
Question 7	<input type="text" value="indices"/>	<input type="text" value="1"/>
Question 8	<input type="text" value="inequalities"/>	<input type="text" value="1"/>
Question 9	<input type="text" value="lines"/>	<input type="text" value="3"/>
Question 10	<input type="text" value="logs"/>	<input type="text" value="1"/>

Flowchart for Quiz Design





Designing or editing a quiz



Generating new quizzes

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- **reset log-files and counters, to reuse the same quiz;**
- **archive or remove old log-files;**
- **remove unwanted archives.**

Script for
rebuilding
used quiz
(PERL)

Display form
(HTML)



Student ID

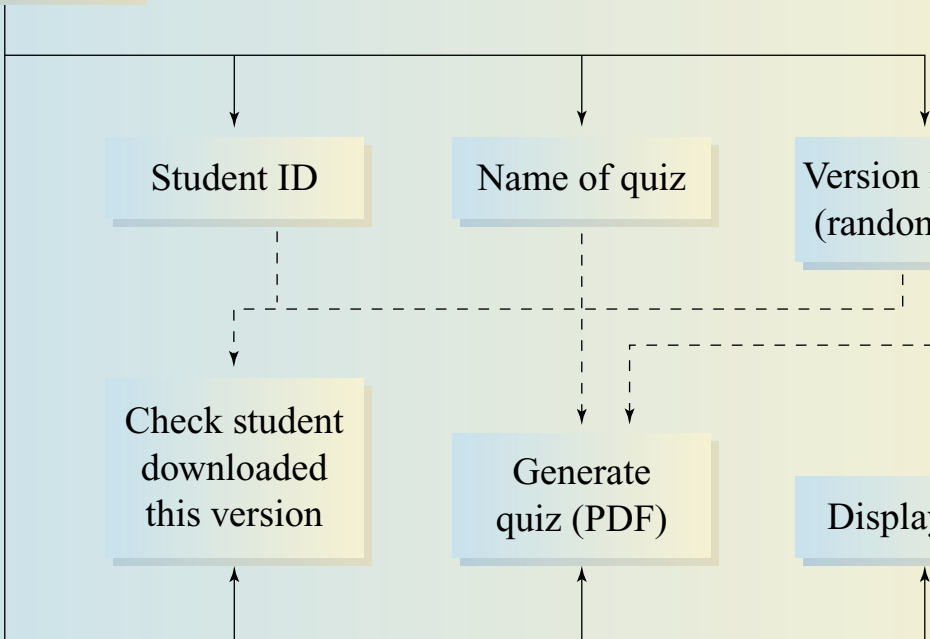
Name of quiz

Version number
(random seed)

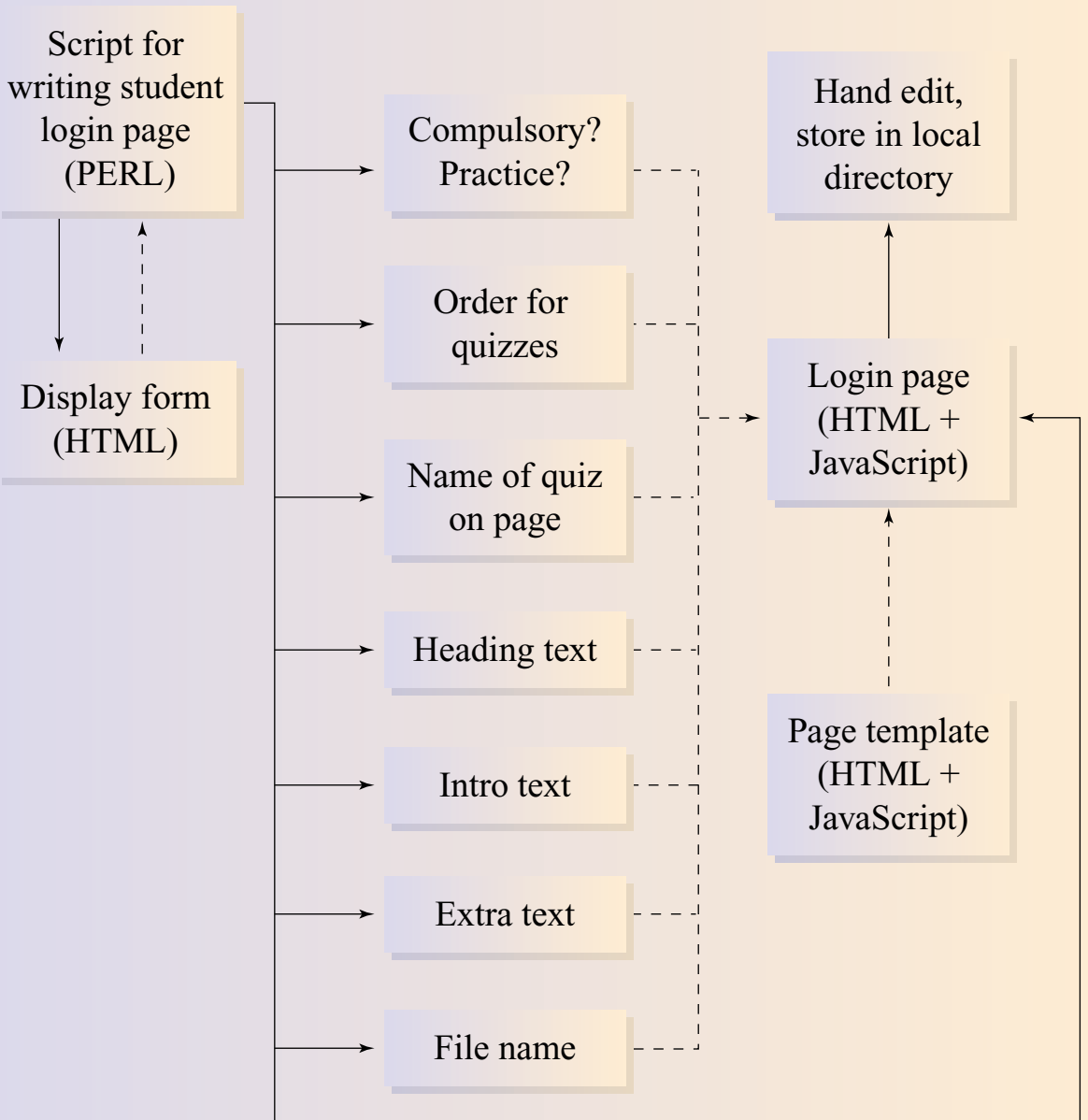
Check student
downloaded
this version

Generate
quiz (PDF)

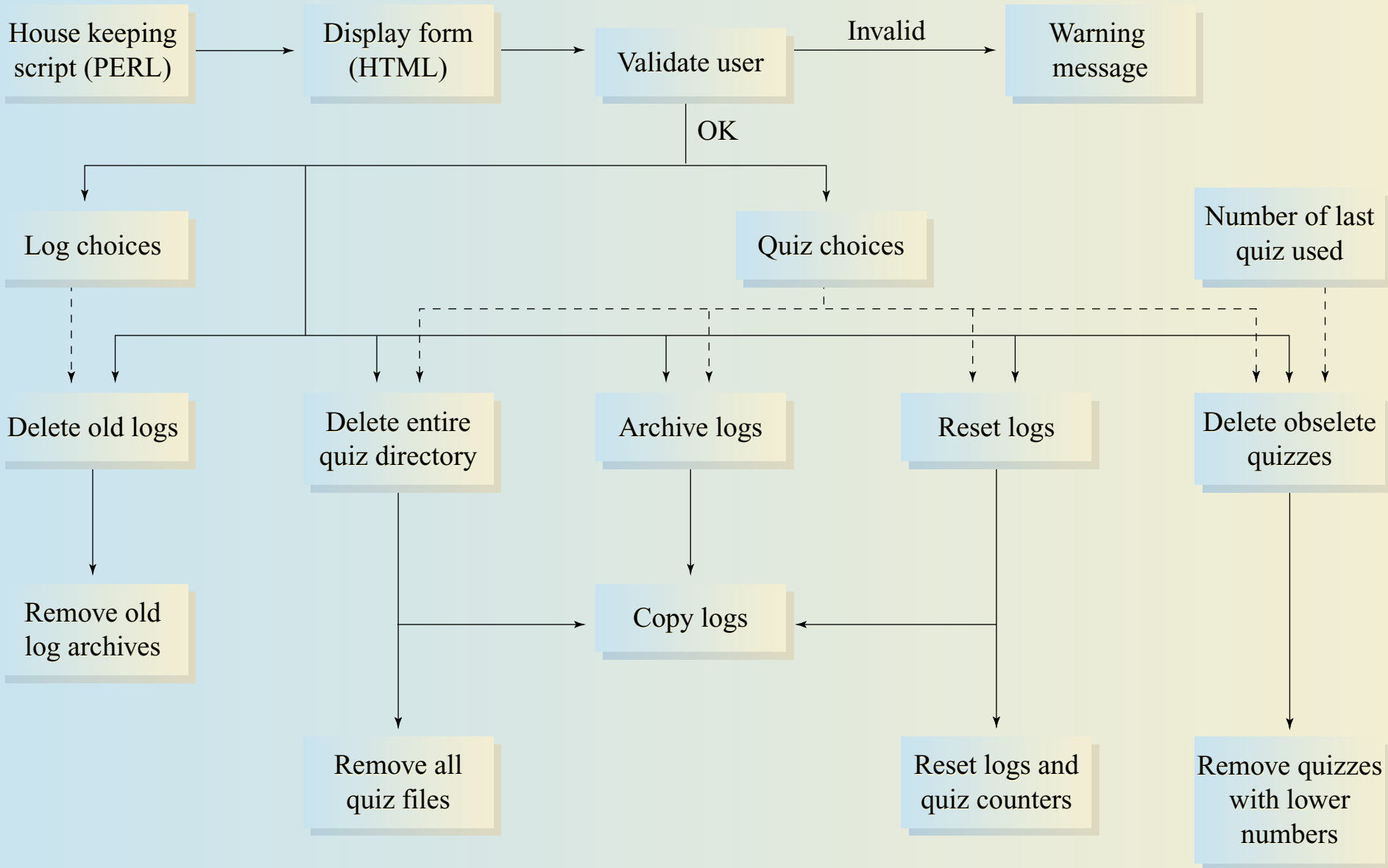
Display quiz



Recreate a used quiz



Making the student login page



House-keeping tasks

Bibliography

- [1] Adobe Systems Inc.; “Acrobat Forms JavaScript Object Specification, Version 4.0”; Technical Note #5186; Revised: January 27, 1999.
- [2] Adobe Systems Inc.; Acrobat Reader, viewer for PDF format [4] documents, available free of charge from <http://www.adobe.com/>.
- [3] Adobe Systems Inc.; “FDF Toolkit Overview”; Technical Note #5194; Revised: August 10, 1999.
- [4] Adobe Systems Inc.; “Portable Document Format, Reference Manual, Version 1.3”; March 11, 1999.
- [5] Adobe Systems Inc.; “pdfmark Reference Manual”; Technical Note #5150; Adobe Developer Relations; Revised: March 4, 1999.

Bibliography

- [6] Hàn, Thê Thành; pdf-TEX, free software for generating documents in PDF format, based on the TEX typesetting system. Available for all computing platforms; see <http://www.tug.org/applications/pdftex/>.
- [7] Lamport, Leslie; L^ATEX, a Document Preparation System. This is free software available for all computing platforms. Consult the TEX User's Group (TUG) website, at <http://www.tug.org/>.
- [8] Netscape Communications Corporation; Nestcape JavaScript Reference, 1997; available online at <http://developer.netscape.com/docs/manuals/communicator/jsref/toc.htm>.
- [9] Story, Donald; exerquiz & AcroTEX, packages for including special effects in PDF documents, using TEX and L^ATEX. Dept. of Mathematics and Computer Science, University of Akron. Software available online from <http://www.math.uakron.edu/~dpstory/webeq.html>.

Bibliography

- [10] Wall, Larry; *Perl*, a general purpose scripting language for all computing platforms. This is Free Software, available from <http://www.perl.com/>.
- [11] Wolfram Research Inc; *Mathematica*, a system for doing Mathematics by computer. Consult the website at <http://www.wri.com/>.

Overview of the system

- **Student Interaction**

- Sending a quiz to the student's browser
- Recording results from a quiz
- Viewing quiz logs and student logs

- **Quiz Management**

- Overview of the Mac $\text{Q}\text{T}\text{E}\text{X}$ system
- Directory structure of the Mac $\text{Q}\text{T}\text{E}\text{X}$ system

- **Designing a Quiz**

- Designing or editing a quiz
- Generating new quizzes

- **Other Features**

- Recreate a used quiz
- Making the student login page
- House-keeping tasks