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Effective Electronic Marking
for
On-line Assessment

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Introduction

- Pressure to deliver computer programming courses using available resources with maximum efficiency

- Testing and marking assessed pieces of software is time-consuming and can be unreliable if attempted manually

- Development of a suite of programs for on-line submission and testing of programming assignments [CTI'96]

- Electronic Marksheets

Marking

- Support the process of marking

- Enable marking tasks to be divided among several individuals

- Maintain rigour and consistency

- Facilitate delivery of feedback to student

The BOSS Online Submission System

- Students may submit programs on-line (with checks)

- All submissions for a specified item of coursework can be run against a number of sets of data

- Submissions and the results of the testing process can be inspected on-line by authorised staff

- Anonymity is preserved

- Students can test their programs

- Final marks are stored in (University) database

- Final marksheets are produced for examination secretaries

Electronic Marksheets

- Graphical *electronic marksheets*, using the Tcl/Tk toolkit

- Lecturers specify categories (and weights) for which marks are awarded, and a graphical marksheet is constructed

- Integrates marks resulting from running and testing program with those relating to style, etc

Automatic Tests

- Marks resulting from the automatic tests are incorporated into the marksheet directly

- If output is correct, full marks are declared on the marksheet

- If program fails, no marks are awarded

- Lecturer may subsequently adjust the automatically assigned marks

Interface

- Buttons enable marker to inspect results, run tests, etc

- Remaining categories of marks are awarded by moving the sliders

- Final mark is calculated when marks are combined with weights (not shown to marker)

- Avoids bias in marking

- *Unmarked* box is highlighted to indicate which parts of the marksheet need addressing

Anonymity

- Assignments are identified using student identification numbers alone

- Anonymous marks are linked into the central university database

- Reintegration produces a list of final marks by name, once marking is complete

Consistency and Reliability

- Allows double (or multiple) marking on same marksheets

- Allows moderator to view both sets of marks and original submission in arriving at a final judgement

- Suggested final marks are offered by the system

Feedback

- Extensive commenting facility is included

- Invoked by buttons at top of marksheet

- Allows each marker to comment on the submission either for moderator or for student

- Moderator may edit student feedback

- System emails comments to student directly

- Private comments by markers are kept confidential

- All comments and each set of marks are retained (subject to DP legislation)

Summary

- Speed

- Accuracy

- Ease of use

The Future

- Java

- Fully networked

- Integration with other software