How to make early beginners learning C easier? Codecast, Taskgrader and WebLinux, three innovative tools implemented in MOOCs to enhance teaching and learning of C programming with Linux.

**CODECAST**
- integrated development environment (IDE) with audio comments made by the instructor.
- interactive tutorial tool that enables learners to modify and test code in the instructor's tutorial itself.
- interactive input/output.
- ACE editor with colored syntax highlighting.
- multiple visualization modules (memory heap/stack, matrices, algorithms...).

**TASKGRADER**
- hands-on coding activities.
- a large scale grading system that uses Linux Containers to grade source codes securely.
- 3 steps: unit testing, source code parsing, performance metrics (Memory, CPU).
- integrated in Open edX using the LTI protocol.
- instructor can set up customized feedback for learners based on common errors.

**WEBLINUX**
- Linux OS 100% in the browser.
- no need for learners to install Linux.
- no need for instructors to provide Linux servers.
- 100% client-side execution:
  - Local File Management (browserFS)
  - code editor (ACE-based)
  - a terminal with a full Linux system.

**MOOC lessons’ structure**

**CODECAST**: learners are taught, experiment with the instructors' code examples and test their own code.

**WEBLINUX TUTORIAL**: learners are getting information through «traditional» screencasts.

**TASKGRADER ASSESSMENTS**: learners are asked to produce and submit a program based on a challenge. They are given unlimited attempts (mastery learning). They can ask for hints and are getting individual automated feedbacks.

**FORUM**: Learners are getting help from fellow learners and teaching staff.

16% overall completion rate

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