

LearnCoding - Customizable Learning

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What is LearnCoding?

LearnCoding is a teaching and learning platform created with flexibility and extensibility in mind.

Designed to create content that is accessible to anyone regardless of field of study, level of expertise or what language you speak.

Our platform consists of learning **modules** that represent broader concepts within the realm of computer science and programming. For example a module might cover **Data Structures**. These modules contain any number of **lessons** related to that concept. The Data Structures module may contain lessons on **Binary Trees** or **Linked Lists** for example. All the lessons can be accessed at any time and in any order.

What makes it different?

Extensibility

Although initially a lesson may only contain basic content in **English**, for the **Java** programming language and using examples from **Computer Science**. Instructors are able to contribute to lessons with translations, expertise in other programming languages or disciplines or other relevant information. This allows the existing lessons to serve as repositories of information that naturally grow highly accessible and informative.

Customizability

Naturally, as the lessons grow to contain more options for the user to choose from, the lessons become highly customizable to fit any student's need regardless of spoken language, level of expertise in a specific programming language or their field of study.

What's Inside a Lesson?

The lessons themselves consist of various pages of content, known as **topics**. These topics are currently one of four types.

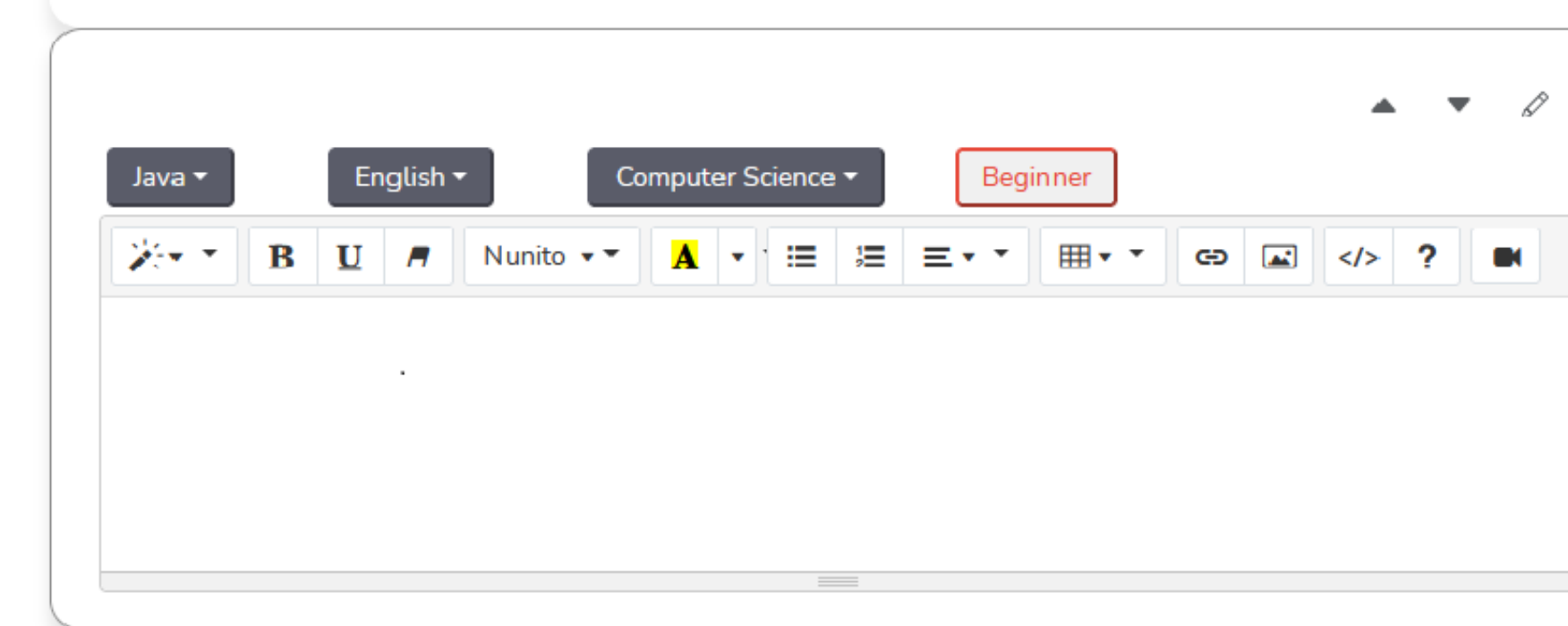
- Text (including images and videos)
- Coding Quizzes
- MCQ and Short Answer Quizzes
- Step by Step Tutorials

All the topics can be easily navigate to using the menu in the sidebar. They are completely accessible at any point in time since the aim is to give the user as much freedom is possible to learn about whatever they're interested in.

Building Blocks

Text, Images and Videos

Text articles where an instructor can explore lesson's topic and teach the student however they deem fit. This may include examples with code, case studies, videos and images, specific applications and more.



The pages themselves are created using **blocks** of content that can be further configured to change with given set of **customization options**.

Example Lesson

Above you can see the current layout of a lesson with two different customization option sets selected. English and Java on top and French Python below. The student can navigate to different topics in a lesson, or other lessons in the module using the sidebar on the far left. The dropdowns for the customization of the lesson are found at the top of the page.

Code Examples

Similar to text content, **code** content can be added to lessons using code blocks within the lesson editor that have a code editor.

Quizzes

The **Quizzes** can either be **Coding Quizzes** or **MCQ and Short answer**. The Coding Quiz ask the user to write a simple program and verifies the user's code using unit tests written by the instructor.

The **Tutorials** are simple step by step guided exercises to illustrate a coding concept to a user.

Tracking Progress and Badgr

As the user completes content in a **module** the system will track their progress. In order to complete a **module** a user must complete all the content that actually tests their new knowledge, that is to say they must complete all the **Quizzes** in a module.

Upon completing all the **basic** quizzes in a module they will be awarded a **Badgr OpenBadge** certifying their accomplishment.

Upon completing all the advanced quizzes they are awarded an **advanced Badgr OpenBadge**.

Tech Stack

The application has a Laravel PHP backend, MySQL database, jQuery was used for the front end. User code is tested using the Judge0 API running in a docker container. All of which runs on a RHEL8 VM on UBC servers.

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