Generate Questions for MyLearn

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1 Intro

Randomized multiple-select and single-select question generation for the MyLearn platform at the Vienna University of Economics and Business. Question templates in the form of the R/exams package are transformed into MyLearn's XML format. Note that the feedback has to stay simple. The imported questions can be organized into exams in the Learning Activities.

Dependencies:

- `libxml2`: found on popular Linux distros and in Rtools by default
- `pandoc`: gets installed by `R` during installation
- `R`: a recent version
- popular `R` packages: installed automatically

The question import functionality has to be turned on by the Learn development team per course. Their address is "learn" `at` "wu" `dot` "ac" `dot` "at".

2 Installation

```
install.packages("devtools")
devtools::install_github("https://github.com/hdarjus/WU-MyLearn-QGen")
```

3 Demo

One creates an `R/exams` compatible exercise file similar to `example_question.Rmd`, decides for a name prefix and for the number of generated exams.

```
library("exams.wuvienna")
n <- 10L  # number of variants of the exercise
name <- "learn_exercise"  # prefix of the generated file names
exercise_file <- example_paths()["R_table"]
output <- exams2mylearn(filename = exercise_file,
                        n = n)
```

The output .zip filepath is saved in `output`. One can upload that .zip file to Learn directly (after the Learn development team has activated that feature for the given course).

4 Recommended Workflow

4.1 Writing the Question Templates

The question templates are the .Rmd files. Find how-to's in the files returned by `example_paths()`. Best starting point is `example_paths()["mixture"]`, that contains solutions to most features you might need in an exam question.

The recommended way of debugging the questions is via

```
filename <- "potential-exercise.Rmd"
exams::exams2html(filename, n = 1L,
                  converter = "pandoc-mathjax",
                  verbose = TRUE)
```

The generated HTML file opened in the browser closely resembles the looks of the exercise on MyLearn.

4.2 Generating the Exercises

Set the current working directory to where the exercise templates are, then run the following.

```
filenames <- list.files(pattern = ".*.Rmd$")
n <- 25L
for (filename in filenames) {
  exams2mylearn(filename, n = n,
                outfile = "exam-exercises.zip",
                dir = ".", dontask = TRUE)
}
```

4.2.1 Tip

If you're uploading improved exercises over and over again, I recommend executing the following `for` loop instead:

```
filenames <- list.files(pattern = ".*.Rmd$")
n <- 500L
for (filename in filenames) {
  exams2mylearn(filename, n = n,
```

```
                outfile = "exam-exercises.zip",
                dir = ".", dontask = TRUE,
                distort.shortname = TRUE,
                verbose = TRUE)
}
```

This way the shortname will be unique every time and you will have more feedback on where the generation process is.

4.3 Uploading to MyLearn

In the course find *Administrate*, then under *"Old" learning materials* click on *organize*. Then under *XML-file* choose the .zip file created in the previous step. Finally, click on *Import learning materials*.

4.3.1 First Upload

At the first upload a newly opened window shows a row for each exercise in the .zip file. Those containing plots show a warning, that is normal. By clicking on *Ansicht*, the uploaded exercise appears.

There is no way out from here, go back to the home page.

4.3.2 Re-uploading with the Same Shortname

In this case a smaller list of the re-uploaded exercises is shown. Choose all of them and click on *Submit*. This overwrites the old versions.

4.4 Importing Exercises

Yes, uploading and importing are different steps. In the menu of the course's *Learning activities*, click on *Import* > *Import of existing learning materials*. A table of uploaded exercises appears.

Use the filters to filter out your exercises. The most useful filters are *Already imported* set to *No* and the text input where you can use the unique shortnames.

Select all exercises with one click, then *Selected items* > *Import*. This brings you to the imported exercises. Select all and then *Selected items* > *Add to clipboard*.

4.5 Organizing a Random Question on MyLearn

Create a new *Poolfolder* in the *Learning activities* and open it. Click on *Clipboard* > *Insert content here* and then *ok*. Release all questions in the poolfolder otherwise the random question won't work.

Now create a *Proxy* outside of the poolfolder and associate it with the poolfolder you created. This was the last step, congratulations!

The poolfolder contains the pool of questions that the random question will choose from. It samples with replacement from the pool each time someone opens the question. Poolfolders and their content are always hidden from students.

At this point I recommend that you delete the exercises in the imported view. For that: in the menu of the course's *Learning activities*, click on *Import* > *Import of existing learning materials*. Delete all exercises.

5 Issues

1. German characters don't work on Windows.
2. MyLearn handles only single select and multiple select questions.

6 Further Reading

For how to import the generated questions, please contact the learn team.

For how you could use the imported questions, please read up on Poolfolders and Proxy questions, Sample Exams, Strict Sequencing Study Modules in the MyLearn-Guide.

7 Maintainance

Should you find bugs, please use the Issue tracker on Github. If you have a minimal example of a .Rmd question that does not compile or Learn gives an error at the stage of import, you can contact me under "darjus" `dot` "hosszejni" `at` "wu" `dot` "ac" `dot` "at". Please attach the .Rmd file in question.