

Random exam generator

Version 1.0

André Zúquete

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This generator is a Java program (`Shuffle.java`) that reads a file with a set of questions and generates a random, formatted subset of questions. It uses the `gson` Google JSON handling package.

1 Input file format

Each question in the source file is defined by a JSON object, with the following fields (see example in Listing 1):

"`question`" : the text of the question;

"`type`" : the type of question (the generator can recognize several types). Currently only `1onN` is recognized (means a single correct answer among N);

"`choices`" : The value of N in `1onN`;

"`tag`" : An optional label that is used to avoid selecting very similar questions. Those questions should have an equal tag;

"`correct`" : Array with the numbers of the correct answers;

"`1`" : Text of answer #1.

As you can see in Listing 1, \LaTeX commands included in the source file need the `\` character properly escaped.

The `1onN` format requires at least $N - 1$ wrong answers per question.

2 Running the generator

The generator reads a source file from `STDIN` and writes the random questions to the `STDOUT`. It takes as arguments the number of random questions to generate and the name of the file where the solutions are to be saved.

For handling questions in portuguese in a UTF-8 source file you should use the following option with the Java command:

```
-Dfile.encoding=UTF-8
```

Listing 1: Example of a JSON source file

```
{
  "question": "This is question number 1, with a \\textbf{bold} word",
  "type": "1onN",
  "choices": 4,
  "tag": "first",
  "correct": [3,4],
  "1": "R1 (wrong)",
  "2": "R2 (wrong)",
  "3": "R3 (correct)",
  "4": "R4 (correct)",
  "5": "R5 (wrong)",
  "6": "R6 (wrong)"
}

{
  "question": "This is question number 2, which is similar to number 1",
  ,
  "type": "1onN",
  "choices": 4,
  "tag": "first",
  "correct": [3,4,8],
  "1": "R1 (wrong)",
  "2": "R2 (wrong)",
  "3": "R3 (correct)",
  "4": "R4 (correct)",
  "5": "R5 (wrong)",
  "6": "R6 (wrong)",
  "7": "R7 (wrong)",
  "8": "R8 (correct)"
}

{
  "question": "This is a completely different question number $3$",
  "type": "1onN",
  "choices": 4,
  "correct": [1,4],
  "1": "R1 (correct)",
  "2": "R2 (wrong)",
  "3": "R3 (wrong)",
  "4": "R4 (correct)",
  "5": "R5 (wrong)",
  "6": "R6 (wrong)",
  "7": "R7 (wrong)",
  "8": "R8 (wrong)"
}
```

3 Format of the questions generated

The random questions produced by this program are prepared to be used in L^AT_EX using the `exam` document class¹. An example, produced from the source file in Listing 1, is presented in Listing 2.

Listing 2: Example of two randomly generated questions

```
\question
This is a completely different question number $$$
\begin{parts}
\part R1 (correct)
\part R5 (wrong)
\part R3 (wrong)
\part R7 (wrong)
\end{parts}
\question
This is question number 1, with a \textbf{bold} word
\begin{parts}
\part R1 (wrong)
\part R5 (wrong)
\part R6 (wrong)
\part R4 (correct)
\end{parts}
```

¹<http://www-math.mit.edu/~psh/exam/examdoc.pdf>