AcroTEX.Net

The dljslib package
German number format

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This article documents and discusses the option, useDeNums (alias, useGermanNums), for the dljlib package designed to work with numbers in the German format. For Germans and many other countries the comma (,) is used for the decimal mark.

This useDeNums option requires recent versions of both exerquiz (2021/04/12) and dljslib (2021/04/04).

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1. Introduction

This article concerns entering German formatted decimal numbers into a text field created by \RespBoxMath. Acrobat/Adobe Reader do support German format numbers, but this is a general purpose feature and does not integrate well into the exerquiz way of doing things; after the number is entered, the number is submitted to the JavaScript engine for analysis to determine if it is the correct answer.

The purpose of the useDeNums (allow called useGermanNums) is to support a decimal number that is formatted in the manor the Germans (and many other countries) do. The comma (,) is supported as the decimal separator, but the thousands separator (.) is not supported.

2. Documentation

When the useDeNums option is specified in the option list of dljslib, the JavaScript function ProcRespNumsDe and several "filters" are defined by the dljslib package. The option and the JavaScript function are designed to be used with the command \RespBoxMath of exerquiz; the basic functionality of this option is shown in the example below.

(Ans: 4,2)

```
\RespBoxMath{4.2}{1}{.00001}{[0,1]}*{ProcRespNumsDe}
```

The function ProcRespNumsDe scans the input to determine if there is an English decimal point (.);[1] if found, an alert box is emitted. Because exerquiz only processes decimal numbers using the English decimal point (.) as the decimal separator, internally, ProcRespNumsDe replaces any occurrence of the comma (,) with a English decimal point (.). Notice that all arguments of \RespBoxMath are specified in English notation. This basic form allows non-number expressions in the input box; for example

(Ans: 17,88 x^(0,5))

```
\RespBoxMath{17.88 x^(0.5)}{3}{.00001}
  {[0,1]}*{ProcRespNumsDe}
```

By the way, the coefficient and exponent can correctly be expressed as rational numbers.

Inputting numerical values only. For questions (posed by \RespBoxMath) that require a numerical input only, the useDeNums option defines filtering commands to scan the user input to verify it is in the expected form.

\numDe

- **Force the use of (decimal) numbers only.** The \numDe filter requires a

[1] We refer to the decimal point here as the English decimal point, but this is a convenient way of referring to all countries that use the period (.) as a decimal separator.

number in the German number format; this is a general number requirement; integers and decimal numbers are accepted, but rational numbers and other non-numeric expressions are not allowed.

(Ans: 4,2)

```
\RespBoxMath{4.2}{1}{.00001}
  {[0,1]}[\numDe{\MsgDei}]*{ProcRespNumsDe}
```

Correct answer is 4,2, the number 4,0000001 is acceptable and correct; 42/10 is not acceptable input. The critical code is,

```
[\numDe{\MsgDei}] (placement shown underlined above)
```

which is inserted just after the interval specification. The argument of \numDe is a message that is displayed if the user does not meet the input requirement. The definition of \MsgDei is as follows:

```
\flJSStr*[noquotes]{\MsgDei}{"German decimal notation is
expected, for example: 12,3456."}
```

\rndNumDeReq

- **Require exactly n decimal places.** The \rndNumDeReq filter requires a decimal number (using German notation) with a specified number of decimal places; for example,

(Ans: 4,20)

```
\RespBoxMath{4.2}{1}{.00001}
  {[0,1]}[\rndNumDeReq{2}{\MsgDeii}]*{ProcRespNumsDe}
```

Here, the correct response 4,20, but note 4,2. The critical code is,

```
[\rndNumDeReq{2}{\MsgDeii}] (placement shown underlined)
```

inserted immediately after the interval specification. The first argument of \rndNumDeReq is the number of decimal places required; the second argument is a message that is displayed if the user does not meet the input requirement. The definition of \MsgDeii is as follows:

```
\flJSStr*[noquotes]{\MsgDeii}{"A decimal number is required,
rounded to two decimal places, for example: 12,34"}
```

If you require three decimal places, then define your own alert message based on this example:

```
\flJSStr*[noquotes]{\MsgDeiii}{"A decimal number is required,
rounded to three decimal places, for example: 12,345"}
```

Of course, if you are forcing the German decimal mark on the user, then German must be your local language; these messages should be redefined into German.

\rndNumDeOpt

- **Require at most n decimal places.** The \rndNumDeOpt filter requires a number, in German decimal notation, with at most n decimal places.

  [ ] (Ans: 4,2)

  ```
  \RespBoxMath{4.2}{1}{.00001}
    {[0,1]}[\rndNumDeOpt{2}{\MsgDeii}]*{ProcRespNumsDe}
  ```

  Here, the user must input 4,20, not just 4,2. The critical code is,

  [\rndNumDeOpt{2}{\MsgDeii}] (placement shown underlined)

  inserted immediately following the interval specification. The first argument of \rndNumDeOpt is the number of decimal places required; the second argument is a message that is displayed if the user does not meet the input requirement. The definition of \MsgDeii is given above. Compare the response of the field to entering 4,2; 4,20; and 4,200. A decimal place is not required in this form; for example, 4 is a valid input, but is a wrong answer.

3. Comprehensive Examples

We conclude this article a quiz that incorporates the ideas present earlier.

Start Answer each of the following, passing is 100%.

1. Differentiate: $4{,}78x^{0{,}4} =$ [ ] (Ans: 4,78x^(0,4))

2. Enter the number 4.2 in German format:

[ ] (Ans: 4,2)

3. Enter the number 4.237 in German format, round to two digits:

[ ] (Ans: 4,24)

4. Enter the number 3.14159 in German format, round to three digits:

[ ] (Ans: 3,142)

End | Score: | Correct

Ans: [ ]