exercisebank - manual
v0.1.3

(build 71)

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If you found any bugs or want new functionality, to contribute, view the commented source, get latest version of this package or get in touch with me, you can do all of that at https://github.com/Strauman/exercisebank/. If you have questions of functionality, kindly direct them to the community http://tex.stackexchange.com. The author is active on this site regularly.

Contents

1 Motivation

Exercises are saved as separate files containing part problems. These files can be used to make sets, and you can cherry-pick or exclude certain part problems as you see fit. This makes it easier to maintain and keep your exercises flexible as the syllabus changes.

2 Flow/Moderate start

I suspect that working with this package will break you current flow. So let's go throught it.
Most likely you would want to put all your exercises in a folder. To set the default folder, use `\exercisebanksetup` → P. 10. In these examples we use `exercises/`.

exercises/myexercise.tex

```
\begin{intro}
  This introduces our problem
\end{intro}
\begin{problem}
  This is a partproblem 1,
  and will be hidden (just wait, you'll see)
\end{problem}
\begin{problem}
  This is a partproblem 2.
  This will not be hidden, but become part problem a!
\end{problem}
```

Let's build all of them first. In the main file, (the one where you include this package):

main.tex

```
\documentclass{article}
\usepackage{exercisebank}
\exercisebanksetup{exercise directory=exercises}
\makeset{myExerciseSet}{myexercise}
\begin{document}
  \buildset{myExerciseSet}
\end{document}
```

This builds the entire set, and adds Problem header and partproblem counters ((1a) and (1b)) by default.

2.1 Select

Now, let's build only the second problem.

main.tex

```
\documentclass{article}
\usepackage{exercisebank}
\exercisebanksetup{exercise directory=exercises}
\makeset{myExerciseSet}{\select{myexercise}{2}}
\begin{document}
  \buildset{myExerciseSet}
\end{document}
```

This should only build the intro and the one exercise you \selected!
Now, say you want to hide the intro. Well all you have to do in this case is make the package treat the intro as a problem in regards to what is \selected. Just add the optional argument [⟨*intro*⟩] to \make. That is switch

```
\makeset{myExerciseSet}{\select{myexercise}{2}}
```

with

```
\makeset[intro]{myExerciseSet}{\select{myexercise}{3}}
```

Notice that there are 3 'partproblems' now since we have to count the intro!

2.2 Exclude

But what if you have an exercise with 12 partproblems, and you only want to exclude the 7th partproblem? Well, then \Exclude is here to rescue the day for you.

```
\makeset{myExerciseSet}{\exclude{soManyExercises}{7}}
```

Here it's important to note that the [intro] argument would not make the intros disappear. If we wanted to only exclude the intro from our previous example file `exercises/myexercise.tex` we would do

```
\makeset[intro]{myExerciseSet}{\exclude{myexercise}{1}}
```

So we're excluding the partproblem 1. But that's the intro when we send the [intro] optional argument

2.3 Displaying numbers

If you have many part problems, counting the problem numbers can be a real hassle. Just use `\ShowNumbers`, and a big number will appear in front of every part problem!

2.4 Multiple

In `\makeset` you can just separate exercises with commas! Here is an example: Let's say you have two files with exercises. One located in `exercises/circuits/RLC.tex` and one in `exercises/ohm/ohmsGeneralLaw.tex`, and you want to include part-problem 1 through 5 from `RLC.tex` and all of the exercises from `ohmsGeneralLaw.tex`.

```
\makeset{\select{circuits/RLC}{1,...,5}, ohmsGeneralLaw}
```

This will divide it up with problem headers. So that what is in the `RLC.tex`-file will be Problem 1, and `ohmsGeneralLaw.tex` Problem 2.

2.5 Mixnmatch

What if you want to make both of them the same exercise? Well, then you pass the [nohead] argument to `\makeset`:

```
\makeset[nohead]{\phead, \select{circuits/RLC}{1,...,5}, ohmsGeneralLaw}
```

The `\phead` command makes a problem header. You can pass them as much as you want:

```
\makeset[nohead]{\phead, \select{circuits/RLC}{1,...,5},
              ohmsGeneralLaw, \phead, someOtherExercise, moreExercises}
```

2.6 Solutions

The last thing to cover then is solutions. In your exercise files you just use the solution environment

```
\begin{solution}
Solution goes here
\end{solution}
```

They are hidden by default, so you would have to use `\DisplaySolutions` in your main file to display them.

2.7 Using \At

2.7.1 Making your own front page for a set

To create your own front page for each set, you'd use \At\StartBuildset{⟨*FrontPageContents*⟩}. Anyhing you send in to \At\StartBuildset will be executed before the first problem starts:

```
\At\StartBuildset{
  \input{myFrontpage}
}
```

2.7.2 Printing the file name beneath the problem header

Maybe you want to see what files are what problems. One way to do that is hook into the \At\VeryBeginProblem and use \exerciseFile → P. 13.This is the command that the headers call, so anything you put in there will be executed right after the headers.

```
\At\VeryBeginProblem{
  \exerciseFile\\
}
```

Note that the \AtBeginProblem is executed *before* the headers.

2.8 Dynamic figure path

Exercisebank automatically allows you to \input and \includegraphics from the same as exercise is in. E.g. if you have a declared the option

```
\exercisebanksetup{exercise directory=exercises}
```

and you have a file `exercises/somedir/myexercise.tex`, you can put a figure in `exercises/somedir/` or make a directory with the same name as the file `exercises/somedir/myexercise/`. Then if you put a figure `exercises/somedir/myfig.png` or `exercises/somedir/myexercise/myfig.png` you can just do

```
\includegraphics{myfig}
```

You can change the root dir by doing \exercisebanksetup{figure root directory → P. 10=figures}. See the figure root directory → P. 10 key for more info.
That covers the basics. Enjoy

! \begin{problem},\end{problem},
\begin{solution},\end{solution},
\begin{intro} and \end{intro} has to be on their own line without any spaces!

3 Reference

3.1 Environments

\begin{problem}
⟨*environment content*⟩
\end{problem}

Inside the \keyRef{exercise directory}, you keep your exercises. Inside the exercise file you'd use a problem environment to write your partproblems. It might be a little confusing that you're using \begin{problem} instead of \begin{partproblem} when you're writing a partproblem, but it's less typing.

\begin{solution}
⟨*environment content*⟩
\end{solution}

Things inside here is only visible if \DisplaySolutions are given before \begin{document}

! \end{solution} has to be on it's own line without any leading spaces!

\DisplaySolutions

Turns on the solutions, so they are shown.

\begin{intro}
⟨*environment content*⟩
\end{intro}

Sometimes you'd want to introcude your exercises and tell a little bit about it. Maybe have a figure there also. Those things should go inside this environment. This can be treated as a problem in terms of counting. See \makeset → P. 8 for more info.

3.2 Making sets

\spritesets{⟨*setlist*⟩}

This is a command that is used by sprite to determine what sets are shown in sprite. If this is not given, sprite uses all sets given in \makset

\makeset[⟨*intro,nohead*⟩]{⟨*filable*⟩}

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This command is the one you use to make a set! Later you use \buildset to build the sets you make. The ⟨*filable*⟩ argument is either the name of the file relative to the \setExercisesDir-path (default is nothing, so it's in the root path), or you could use the \select or \exclude to respectively cherry pick or exclude exercises. (See their docs).
[⟨*intro*⟩] this counts the intro environment as a part problem, so that you can \select or \exclude the intro
[⟨*nohead*⟩] prevents the builder from adding a problem header. This is handy if you want to create an exercise that is composed of multiple parts. You can use the \phead to insert the problem header where you want it

```
\makeset[nohead]\{\phead, \select{myexercise}{1,2,3}}
```

\about{⟨*text*⟩}

This contains information about an exercise set. It is intended to be on the top of an exercise, explaining short what the exercise is about. It's only visible when using \sprite

\sprite[⟨*PiP*⟩]

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This is a way to visualize all exercises. It takes one optional argument which is how many pages inside one page. Defaults to 4

> **!** If \sprite is used, it should be the only command in \begin{document}\end{document}

\exclude{⟨*exerciseFileName*⟩}{⟨*Comma separated numbers*⟩}

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As you can see in the intro section of the documentation, this is for excluding partproblems To be used in \makeset

\select{⟨*exerciseFileName*⟩}{⟨*Comma separated numbers*⟩}

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As you can see in the intro section of the documentation, this is for cherry picking partproblems To be used in \makeset

\exec{⟨*macros*⟩}

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You can use this in \makeset to execute commands between problems. E.g. to insert a new page in between two problems when using nohead:

```
\makeset[nohead]{2}{\phead,my/exercise,\exec{\clearpage},next/exercise}
```

\setName

This variable prints out the name of your set that you sent to \buildset. The following example prints "Exercise set number 1" and "Exercise set number 2" on the top of each set

```
\At\StartBuildset{
 Exercise set number \setName
}
 %... \makesets here ...%
\begin{document}
 \buildset{1}{myexercise}
 \buildset{2}{myexercise}
\end{document}
```

\pplabel{⟨*label*⟩}

Labels a partproblem. You can reference to it later using \ppref{⟨*label*⟩}

\ppref{⟨*label*⟩}

Reference a partproblem created by \pplabel{⟨*label*⟩}. This prints e.g. 1c)

\pref{⟨*label*⟩}

Reference a partproblem created by \pplabel{⟨*label*⟩}. This prints e.g. 1

3.3 Configuration and options

You can do a lot of configurations on this package, and probably even more to come in later versions!

`\ShowNumbers`

N v0.1.2 2018/04/17

Shows the numbers in fron of the part problems and intros that should be used with `\exclude` and `\select`

`\exercisebanksetup{`⟨*[key/values]*⟩`}`

N v0.1.0 2018/04/08

Here is a list of the different keys and their meaning

`part problems=`⟨*On/Off*⟩ (⟨*default*⟩=On)

This is whether or not to do part problems. E.g. 1a), 1b) etc. If this is turned Off, then the part problems will be treated as problems

`tighten paragraphs=`⟨*True/False*⟩ (⟨*default*⟩=True)

Disabling this will prevent the package from attempting to prevent part problems to scatter across pages

`problem header=`⟨*macro*⟩ (⟨*default*⟩=see below)

This sets the problem header. To access the translation of the problem text, use `\@tr`{Problem}, and the problem counter is accessed with `\theproblemcounter`.
Defaults to
{`\normalfont\Large\bfseries\@tr`{Problem} `\theproblemcounter`}.

`part problem header=`⟨*macro*⟩ (⟨*default*⟩=see below)

This sets the problem header. To access the current problem, use `\theproblemcounter`, and then the current part problem `\thepartproblemcounter`. To make it a letter, as per default use `\alph`{partproblemcounter}
Default is:
`\large\textbf`{(`\theproblemcounter\alph`partproblemcounter})

`solution header=`⟨*string*⟩ (⟨*default*⟩=see below)

`\large`{`\textbf\@tr`Solution}:

`exercise directory=`⟨*dir*⟩ (⟨*default*⟩=./)

This key is used for setting the default exercise directory.

`figure root directory=`⟨*dir*⟩ (⟨*default*⟩=⟨*exercise directory*⟩)

Exercisebank automatically allows you to `\input` and `\includegraphics` from the same folder folder that your exercise is in, as well as a folder with the same name as the exercise file. This is elaborated in the intro section. However, you might want to put the figures inside a different directory. For example if you have one directory containing your

problems called `exercises/`, set with `exercise directory`, and a file containing the exercise: `exercises/faradaysLaw/ACGenerate.tex`. Then by default figures in the directories `exercises/faradaysLaw/` and `exercises/faradaysLaw/ACGenerate/` can be included by just doing `\includegraphics`. And if you want to change the root of this directory to be `figures`, such that exercisebank looks for figures in `figures/faradaysLaw/` and `figures/faradaysLaw/ACGenerate/` You would use this option in the setup: `\exercisebanksetup`{figure root directory=figures}

```
\exercisebanksetup{exercise directory=exercises,part ↩
    ↪problems=Off,solution header={\textbf{SOL:}}}
```

3.4 Internationalization

`\translateExBank`{⟨*Translation key/vals*⟩}

This is to translate the text inside the package. As of now the available key/values are

- Problem
- Solution

The Norwegian translation would then be done with

```
\translateExBank{Problem=Oppgave, Solution=Løsning}
```

3.5 Triggers

\Trigger{⟨*Any Macro*⟩}

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See \At → P. 13
Available triggers:
\Trigger\BeginPartproblem:
Triggers before a partproblem is inserted
\Trigger\VeryBeginPartproblem:
Triggers right after \BeginPartproblem. This is so that the user can do stuff before the actual headers start. The partproblem headers are invoked by \At\VeryBeginPartproblem
\Trigger\InputExercise:
Triggers before a file is included
\Trigger\BeginProblem:
Triggers before a file is included, but only if problem headers are to be written (no [nohead] given)
\Trigger\EndProblem:
Triggers right after problem is included if [nohead] *not* given
\Trigger\BeginBuildset:
Triggers right before a set has begun building (not if \sprite is used). You might want to put your set-header here
\Trigger\EndBuildset:
Triggers when a set has stopped building (not if \sprite is used)

3.6 General reference

\ownLineNoSpacesGotIt

This is to annoy the user enough to get his attention about the requirements of the problem→ P. 7, solution→ P. 7 and intro→ P. 7 environments.

> DEPRECATED! use \exercisebanksetup→ P. 10 with exercise directory→ P. 10 instead!

\setExercisesDir{⟨*directory*⟩}

> \setExercisesDir is deprecated! use \exercisebanksetup→ P. 10 with exercise directory→ P. 10 instead!

This is the directory, relative to the file you included the package, where the package should be looking for exercises. Default is the same directory as your main file (the one you build).

\isin{⟨*haystack*⟩}{⟨*needle*⟩}{⟨*True*⟩}{⟨*False*⟩}

⟨*haystack*⟩ is a comma separated list of integers
⟨*needle*⟩ is an integer
Executes ⟨*True*⟩ if ⟨*needle*⟩ is found in ⟨*haystack*⟩ else executes ⟨*False*⟩

This package also includes some extra stuff. For example the \At and \Trigger

\At{⟨*AnyMacro*⟩}

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Here you can send any macro because it isn't evaluated! For example \At\BeginSomething is fine and even if \BeginSomething is not defined. Also and when using \Trigger it just ignores it if it didn't exist. It's pretty similar in function as to \AtBeginDocument.

```
\At\BeginSomething{DoSomething}
Which is triggered with
\Trigger\BeginSomething, this evaluates to DoSomething
```

\exerciseFile

This is a 'read-only' macro that contains the name of the current exerciseFile

3.7 Counters

problemcounter-counter holds the current problem number and partproblemcounter-counter holds the current partproblem *number*.

3.8 Macro definitions

4 Changelog

v0.0.2b11 2018/04/02

– Updated documentation syntax.

v0.0.3b38 2018/04/03

– Updated triggers doc

– added trigger \VeryBeginPartproblem

v0.0.3b40 2018/04/03

– Added examples that uses the \At command.

– Making front page and other snacks

v0.0.4b44 2018/04/03

– Changed design of part problems. (Looks much better now!)

v0.0.5b46 2018/04/03

– Fixed partproblems and solutions to fit on pages using \filbreak.

v0.1.0 2018/04/08

– Fixed title of documentation to match actual package.

– Fixed weird paragraph styling when displaying solutions

– Added a few package options. More to come!

v0.1.1 2018/04/13

– Added \exec, which allows the user to execute macros between problems

– Bug fix: \At would cause crash due to latexmk multiple builds

– Bug fix: \sprite wouldn't build correctly

– Bug fix: misc bugs involving \makeset, \buildset, nohead and \phead

v0.1.2 2018/04/17

– Fixed bug that \select and \exclude not working as expected.

– Added \ShowNumbers for displaying numbers related to use in \select and \exclude

v0.1.3 2018/04/20

– Added custom dynamic figure path `figure root directory` → P. 10.

– Fixed bugs related to \phead and the commands used in \makeset-lists.