

## about

padajar-templates is a series of  $\LaTeX$  classes made by Paolo Adajar (that's me!). This originated as a series of  $\LaTeX$  commands in summer 2021, used just for psets, but has since transformed into several classes (padajar-memo, padajar-pset, and padajar-slides) relying on a common package (padajar-defaults). I'm hoping the up-front cost of creating them will be paid back many times over in my future work, and that of others.

These files are open-source and distributed under an MIT License (see [Section C](#)). If you do use them, I greatly appreciate:

- hearing about it
- attribution
- contributing, if that's up your alley
- spreading the word!

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# 1 padajar-defaults

All `padajar-templates` load the package `padajar-defaults`. This package comes with the following features/options.

- Body and math font set to IBM Plex. Body text is IBM Plex Sans by default, but can be changed with the `[serif]` option to IBM Plex Serif. Math font is always serif, like  $\sin^2(\alpha) + \cos^2(\alpha) = 1$  and

$$\Phi(x) = \int_{-\infty}^x \frac{e^{-t^2/2}}{\sqrt{2\pi}} dt.$$

Mono font is set to IBM Plex Mono. All fonts are set to use a lighter weight than the default.

Note that because the `fontspec` package is used, to use this package (and any below templates), **you must** use XeLaTeX or LuaLaTeX. (For me, compilation with the former has been slightly faster.)

- A host of packages loaded by default:
  - for math: `amsmath`, `amsthm`, `physics`, `bbm`...
  - for graphics: `graphicx`, `pdfpages`, `listings`...
  - for tables: `tabularx`, `booktabs`, `threeparttable`...
  - for general utility: `hyperref`, `cleveref`, `enumitem`, `xcolor`...

If you want the full list, head into the source code of this package.

- A `listings` definition for Stata (modified from [here](#)), along with a nicer `listings` scheme.
- Some math commands I find useful: `\eps` ( $\varepsilon$ ), `\E` ( $\mathbb{E}$ ), `\V` ( $\mathbb{V}$ ), and `\indic` ( $\mathbb{1}$ ).
- A `padajar` color scheme! :)

A few other options are used internally by the classes to differentiate between documents and slides.

Notably, `padajar-defaults` is a standalone package. It can be used in any document, not just those in `padajar-templates`, granting additional flexibility.

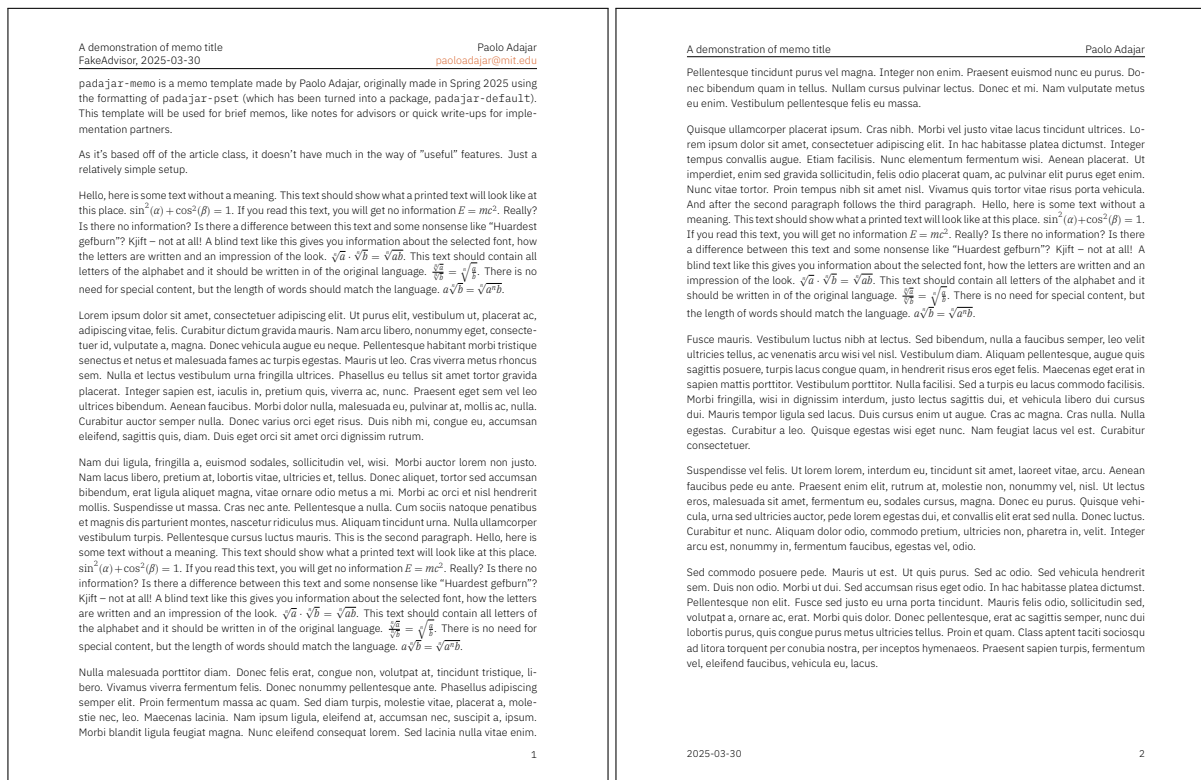
## 2 classes

I've made three different formats that use `padajar-defaults`, each with its own purpose. These cover the vast majority of things that I create: paragraph-dense writing, problem sets, and presentation slides. I've put the same design ethos through them (and my website), with the intent of making my digital presence a tad more “cohesive”.

### 2.1 padajar-memo

This is the simplest template of the three, and is the one that you're currently viewing.

Figure 1: A preview of the padajar-memo class from memo-example.pdf.



padajar-memo is intended for ideas that are communicated with paragraphs, tables, and figures. At its core, it's really just an article document with my usual settings. It comes with these additional features:

- Fancy headers and footers, which take information from `\name`, `\email`, `\date`, `\memotitle`, and `\memonote`.

...and that's really it. The base setup of this class isn't too far different from the article class. It's just meant to be a clean baseline template so I don't always have to futz around with the same imports and options that I always do.

## 2.2 padajar-pset

This class is meant for writing up psets or exams with solutions. As a modification of the exam class, it retains all exam class functionality, like parts and subparts, the solution environment, and creating versions with and without answers included. For more information, refer to [this Overleaf page](#).

Some key features I've added in:

- The reflection environment. These question reflections are intended to help connect questions to the course as a whole, interesting insights gained through the question, and more. Really, they're just a way to help think more about the "why" of questions. These are encased in a gray colorbox, and can be included either by passing the `reflections` option

Figure 2: A preview of the padajar-memo class from pset-example.pdf.

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get constraint. Further, because  $U$  is quasi-concave and the constraints are convex, we will return the global maximizer.

Taking derivatives, we have

$$\frac{\partial \mathcal{L}}{\partial A} = \frac{1}{3} \left( \frac{B}{A} \right)^{\frac{1}{3}} - \lambda p_A = 0$$

$$\frac{\partial \mathcal{L}}{\partial B} = \frac{2}{3} \left( \frac{A}{B} \right)^{\frac{1}{3}} - \lambda p_B = 0$$

$$\frac{\partial \mathcal{L}}{\partial \lambda} = I - p_A A - p_B B = 0$$

Solving the first and second equations for  $\lambda$ , we get

$$\lambda = \frac{1}{3} \frac{1}{p_A} \left( \frac{B}{A} \right)^{\frac{1}{3}} = \frac{2}{3} \frac{1}{p_B} \left( \frac{A}{B} \right)^{\frac{1}{3}} \Leftrightarrow p_A B = 2 p_A A$$

indicating that the consumer will spend twice their income on  $B$  than they will on  $A$ .

If we desire  $A = 2B$ , we must then have that  $p_B = 4 p_A$ .

**Reflection.** Quisque ullamcorper placerat ipsum. Cras nibh. Morbi vel justo vitae lacus tincidunt ultrices. Lorem ipsum dolor sit amet, consectetur adipiscing elit. In hac habitasse platea dictumst. Integer tempus convallis augue. Etiam facilisis. Nunc elementum fermentum wisi. Aenean placerat. Ut imperdiet, enim sed gravida sollicitudin, felis odio placerat quam, ac pulvinar elit purus eget enim. Nunc vitae tortor. Proin tempus nibh sit amet nisl. Vivamus quis tortor vitae risus porta vehicula.

**Problem 2. Example: 14.381 Fall 2021 PS1, #2. (10 points)**

This problem set question is from 14.381, Statistical Methods in Economics, taken with Whitney Newey.

Consider the gasoline demand data that is provided on Canvas and two OLS regressions (all in levels, not logs) for that data:

- the OLS regression of the gasoline purchases on a constant, price, and income
- the OLS regression of the level of gasoline purchases on a constant, price, income, and covariates consisting of the average age of drivers in the household, the number of drivers in the household, and the dummy variable for the availability of public transport.

Assume that there is no heteroskedasticity or autocorrelation.

(3 points) (a) Give Tables of OLS estimates and standard errors for all the coefficients for both regressions i) and ii), assuming there is no heteroskedasticity or autocorrelation.

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**Solution.** We use the following code:

```
1 import delimited "Gasoline Data.csv"
2
3 rename (v1 v2 v3 v4 v5 v6 v7 v8 v9 v10)
4 (state log_quantity log_price log_income dist_gulf_of_mexico
5 log_drivers public_transit mean_age_drivers log_price_cents
6 state_gas_tax)
7
8 foreach v of varlist quantity price income drivers {
9   gen `v' = exp(log_`v')
10 }
11
12 eststo clear
13 eststo: reg quantity price income
14 eststo: reg quantity price income drivers mean_age_drivers public_transit
15
16 esttab
17 esttab using ps1-2a.tex, se replace
```

which yields the following table:

	(1)	(2)
quantity		
price	-3.359*** (1.006)	-2.500* (0.987)
income	0.000*** (0.000)	0.000*** (0.000)
drivers		2.241*** (0.107)
mean_age_drivers		-0.023*** (0.005)
public_transit		-0.643*** (0.185)
_cons	7.856*** (1.336)	3.986** (1.366)
N	8908	8908

Standard errors in parentheses  
\* p < 0.05, \*\* p < 0.01, \*\*\* p < 0.001

(3 points) (b) Do an  $F$ -test of the null hypothesis that all the covariates have zero coefficients.

**Solution.** Using

```
1 test drivers mean_age_drivers public_transit
```

after the above command yields  $F(3, 8902) = 201.24$ , with a  $p$ -value of 0.000. This indicates that the covariates are significantly distinct from 0 at the 5% level.

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to the class or adding printreflections to the preamble.

- The solution environment is encased in a green tcolorbox.
- Headers and footers which take information from \name, \email, \date, \date, \classnum, \classname, and \assignment. Optionally, \professors and \collaborators can take infinite arguments (separated with curly brackets) and add that information to the first page.

And some usage notes:

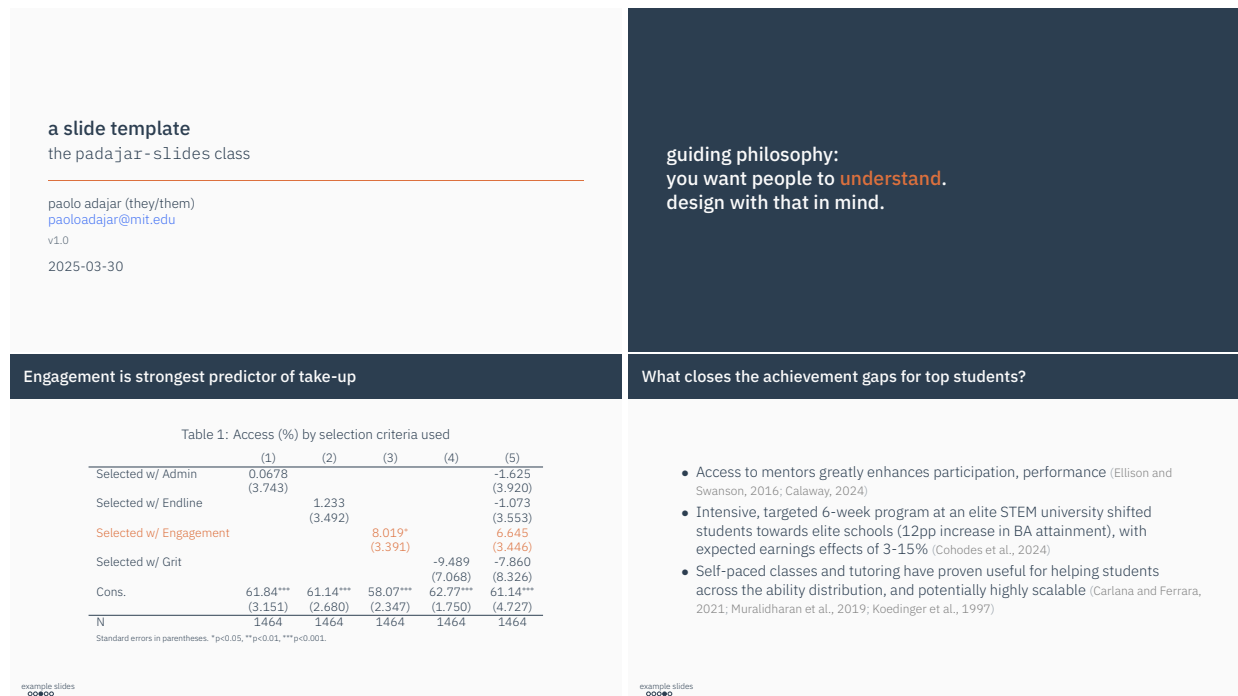
- Questions are styled like sections; you should use \titledquestion command for creating questions, and then write your question text (i.e., not in the question title). While I know this won't work for every field, multi-part questions are the bread and butter of economics psets.
- You can't use table environment (or any other float environment) inside the solution environment. This is currently solved using the float package, and then using the command \begin{table}[H]. I'm still looking for a "better" solution to this.

## 2.3 padajar-slides

This class is based on the moloch theme for the beamer class, hosted on CTAN [here](#).<sup>1</sup> These are used for presentations, including both paper talks and lecture slides.

<sup>1</sup>moloch itself is a fork of the metropolis theme, hosted on CTAN [here](#). metropolis is no longer maintained, and moloch was created to fix some of its bugs — see [this blog post](#).

Figure 3: A preview of the padajar-slides class from slides-example.pdf.



Key features include:

- Navigation bubbles with section titles on the bottom of slides
- The [sectionsides] argument, which, when called, will add a navigation slide at the start of each section.
- \graycitep, which will cite bibliography items like \citep from the natbib package, but will insert citations into smaller, gray text.
- \btLstHL, which can highlight specific lines in an lstlisting environment by using the option linebackgroundcolor=\btLstHL<overlay spec>{range list}
- A default 16:9 aspect ratio, the objectively correct aspect ratio for presentations.

### 3 issues

This set of files is *far* from perfect right now. Some high-priority issues on my to-do list include:

- Missing characters. I've done **some shenanigans** to make the math font thinner, and as a result, there are several missing math characters: \epsilon, \varpi, \varrho, \nabla, \surd, \mapstochar, \lmoustache, \rmoustache, \arrowvert, and \Arrowvert. The first is set to display as \varepsilon ( $\epsilon$ ), which is what I primarily use anyways, and the last two are legacy and shouldn't pose much of an issue. These should all be manually set to other fonts, but because these don't see much use for me, I haven't found the best replacements yet. One I have already redefined is \partial ( $\partial$ ), which is lifted from T<sub>E</sub>X Gyre Schola; peek inside padajar-defaults to see how missing characters should be manually defined.

- Find a better solution for that pesky interaction between floats and `\tcolorbox`.
- Fix a few things I *know* are bad  $\text{\LaTeX}$  coding:
  - When the body text is sans-serif, the math text also becomes sans-serif. To change it back to serif, I use `\renewcommand{\text}[1]{\oldtext{\rmfamily #1}}`. Yuck.
  - Yeah, yeah, I know I should fix `\epsilon` because *some* people want to use it.
  - Refactor the code, particularly looking for any repeated code and cleaning up the margins/parskip/etc. formatting; that in particular has become a bit of a jumble.
  - Nice code for coloring specific rows/cells of a table? Perhaps something like [here](#).

## 4 planned features

These are features I'd like to add in the future, but aren't high priority for me at the moment.

- Create the `padajar-paper` and `padajar-notes` class. I expect the former to be similar to `padajar-memo`, but with a few stylistic changes. The latter will probably be in a similar layout as well, but with functionality more akin to [lindrew](#)'s notes package.
- Make `\btLstHL` work outside of beamer classes (i.e., in documents).
- More common math shortcuts? I know there's plenty more I use.
- Add the `subfiles` package (pending research; some online seem to strongly prefer just using `\include` and `\includeonly`).
- A much closer look at all math symbols, finding alternatives for ones that I think have too much weight.
- Just a general look into compile time, and seeing if there are any ways to speed it up.

## 5 unplanned features

Conversely, here are some things that I explicitly *don't* plan on doing with this set of classes.

- Adding these to CTAN. I think it's incredibly unlikely that these see widespread usage, and probably isn't worth my time. I also think there's far too much idiosyncrasy in all of these formats for them to be used widely. But I guess if you think this has a broader interest, let me know?
- Letting fonts, by default, be something other than IBM Plex. I just like the aesthetic.

## A changelog

- |                    |   |
|--------------------|---|
| 1.0.0 (2025-03-30) | first creation of the memo, pset, and slides classes, each importing the default package  |
| 0.1.0 (2021-07-19) | initial creation of what would become these classes: a series of $\text{\LaTeX}$ commands accessed with <code>\input{paolo-pset.tex}</code> |

## B installation instructions

To use this package and set of classes:

1. Download the following files:

- `padajar-defaults.sty`
- `padajar-memo.cls`
- `padajar-pset.cls`
- `padajar-slides.cls`

2. Place them into *one* of the following places:

- The same folder as the `.tex` that you are trying to create. This will make it available for only that project.
- Add it to a local  $\text{T}_{\text{E}}\text{X}$  folder, where instructions will vary depending on your  $\text{T}_{\text{E}}\text{X}$  installation. This will make it available for all projects on your system.

3. Compile your document using XeLaTeX or LuaLaTeX (required due to `fontspec`).

## C license

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