

# ximera — Simultaneously write print and online interactive materials.\*

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Released 2024/05/12

## Abstract

“Ximera begins where  $\text{\TeX}$  ends.” The `ximera` class aids in the creation of hand-outs, worksheets, exercises, and sections of textbooks to be used either individually or “glued” together via a `xourse` file. All `ximera` documents can be deployed in an online interactive form via `xake`. See: [Ximera Project](#) and the source code on [GitHub](#).

## 1 Introduction

Ximera, pronounced “chimera,” (**X**imera: **I**nteractive, **M**athematics, **E**Resources, for **A**ll) is an open-source platform that provides tools for authoring and publishing (PDF and Online), open-source, interactive educational content, such as textbooks, assessments, and online courses. The Ximera document class provides the following features:

**Formatting for different domains** The Ximera document class provides built-in support for formatting documents in both PDF and online formats, which can be a big time-saver for authors. Additionally, it allows for the simultaneous creation of solution manuals and teaching editions, which can be especially useful for educators.

**Compiling individually or as a whole** With the Ximera document class, authors can easily compile individual documents or an entire collection of documents. This flexibility can be helpful when making changes to specific documents without having to re-compile the entire collection. Moreover, this allows an author to share large portions of a text with another, with minimal changes.

**Interactive content** The Ximera document class allows for the inclusion of interactive content, such as answer boxes that are validated by a client-side computer algebra system. Additionally, it allows for the embedding of YouTube videos, Desmos graphs, and GeoGebra interactives.

**All content displayed** By default, the Ximera document class displays all content to the author. This means the author sees what the students see, along with answers and solutions, and links (that can be checked) to various interactive elements (when deployed, the interactive elements are truly embedded). This can be especially helpful for catching errors or inconsistencies in the content.

Online examples can be found at

<https://go.osu.edu/ximera-examples>

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\*This file describes version v1.5.1, last revised 2024/05/12.

## 2 ximera.cls

### 2.1 Options for the class

We start by listing the options for the ximera document class. Note, since the xourse class is based on the ximera class, all listed options are available there too.

```
1 \*classXimera
```

**handout** The default behavior of the class is to display **all** content. This means that if any questions are asked, all answers are shown. Moreover, some content will only have a meaningful presentation when displayed online. When compiled without any options, this content will be shown too. This option will suppress such content and generate a reasonable printable “handout.”

```
2 \newif\ifhandout
3 \handoutfalse
4 \DeclareOption{handout}{\handouttrue}
```

**noauthor** By default, authors are listed at the bottom of the first page of a document. This option will suppress the listing of the authors.

```
5 \newif\ifnoauthor
6 \noauthorfalse
7 \DeclareOption{noauthor}{\noauthortrue}
```

**nooutcomes** By default, learning outcomes are listed at the bottom of the first page of a document. This option will suppress the listing of the learning outcomes.

```
8 \newif\ifnooutcomes
9 \nooutcomesfalse
10 \DeclareOption{nooutcomes}{\nooutcometrue}
```

**instructornotes** This option will turn on (and off) notes written for the instructor.

```
11 \newif\ifinstructornotes
12 \instructornotesfalse
13 \DeclareOption{instructornotes}{\instructornotetrue}
```

**noinstructornotes** This option will turn off (and on) notes written for the instructor.

```
14 \DeclareOption{noinstructornotes}{\instructornotetrue}
```

**hints** When the **handout** options is used, hints are not shown. This option will make hints visible in handout mode.

```
15 \newif\ifhints
16 \hintsfalse
17 \DeclareOption{hints}{\hintstrue}
```

**newpage** This option will start each problem-like environment (exercise, question, problem, and exploration) start on a new page.

```
18 \newif\ifnewpage
19 \newpagefalse
20 \DeclareOption{newpage}{\newpagetrue}
```

**numbers** This option will number the titles of the activity. By default the activities are unnumbered.

```
21 \newif\ifnumbers
22 \numbersfalse
23 \DeclareOption{numbers}{\numberstrue}
```

**wordchoicegiven** This option will replace the choices shown by **wordChoice** with the correct choice. No indication of the **wordChoice** environment will be shown.

```
24 \newif\ifwordchoicegiven
25 \wordchoicegivenfalse
26 \DeclareOption{wordchoicegiven}{\wordchoicegiventrue}
27 \newif\iffirstinlinechoice% Support for other wordchoice command contents.
28 \firstinlinechoicetrue
```

```

29
30 \newif\ifxake
31 \xakefalse
32 \DeclareOption{xake}{\xaketrue}
33
34 \newif\iftikzexport
35 \tikzexportfalse
36 \DeclareOption{tikzexport}{%
37   \tikzexporttrue%
38   \handoutfalse%
39   \numbersfalse%
40   \newpagefalse%
41   \hintsfalse%
42   \nooutcomesfalse%
43 }
44
45 \DeclareOption*{%
46   \PassOptionsToClass{\CurrentOption}{article}%
47 }
48 \ProcessOptions\relax
49 \LoadClass{article}
50
51 \ifdefined\HCode
52   \xaketrue%
53   \tikzexporttrue%
54   \handoutfalse%
55   \numbersfalse%
56   \newpagefalse%
57   \hintsfalse%
58   \nooutcomesfalse%
59 \fi
60
61 </classXimera>
62 <*classXimera>

```

## 2.2 Loading packages

Since we want `\cancel` to work, we load it here to avoid polluting the `.jax` output.

```
63 \RequirePackage[makeroom]{cancel}
```

Quite a few packages are required by the document class. This is a list of required packages. As packages are added to this list, we should include a comment as to where they are being utilized. This will help keep this list from being redundant and/or outdated.

```

64 \RequirePackage[inline]{enumitem}
65 \RequirePackage[pagestyles]{titlesec}
66 \RequirePackage{titletoc}
67 \RequirePackage{titling}
68 \RequirePackage{url}
69 \RequirePackage[table]{xcolor}
70 \RequirePackage{tikz}
71 \RequirePackage{pgfplots}
72 \usepgfplotslibrary{groupplots}
73 \usetikzlibrary{calc}
74 \RequirePackage{fancyvrb}

```

Load `forloop` for the problem environment dynamic naming and building.

```
75 \RequirePackage{forloop}
```

Now we load even more packages.

```

76 \RequirePackage{environ}% Included to allow saving of environment contents. This does *not* p
77 \RequirePackage{amssymb}% Included to have access to math typeset.
78 \RequirePackage{amsmath}% Included to have access to math typeset.
79 \RequirePackage{amsthm}% Included to have access to math typeset.
80 \RequirePackage{xifthen}% http://ctan.org/pkg/xifthen

```

```

81 \RequirePackage{multido}% http://ctan.org/pkg/multido
82 \RequirePackage{listings} %% is this required???
83
84 \RequirePackage{xkeyval}
85
86 \RequirePackage{comment}
87 \end{classXimera}

```

Various packages must be loaded early to avoid polluting the .jax file.

```

88 \begin{classXimera}
89 \RequirePackage{getttitlestring}
90 \RequirePackage{nameref}
91 \RequirePackage{epstopdf}
92 \end{classXimera}

```

## 2.3 Page setup

We want non-indented spaced-out paragraphs.

```

93 \begin{classXimera}
94 \setlength{\parindent}{0pt}
95 \setlength{\parskip}{5pt}
96 \end{classXimera}

```

To avoid weird margins in 2-sided mode, change the margins.

```

97 \begin{classXimera}
98 \oddsidemargin 62pt
99 \evensidemargin 62pt
100 \textwidth 345pt
101 \headheight 14pt
102 \end{classXimera}

```

On the HTML side, there is more complicated page setup to perform.

```

103 \begin{cfgXimera}
104 \Preamble{xhtml}
105
106 % We don't want to translate font suggestions with ugly wrappers like
107 % <span class="cmti-10"> for italic text
108 \NoFonts
109
110 % Don't output xml version tag
111 \Configure{VERSION}{}
112
113 % Output HTML5 doctype instead of the default for HTML4
114 \Configure{DOCTYPE}{\HCode{<!doctype html>\Hnewline}}
115
116 % Custom page opening
117 \Configure{HTML}{\HCode{<html lang="en">\Hnewline}}{\HCode{\Hnewline</html>}}
118
119 % Reset <head>, aka delete all default boilerplate; alternatively set up new content
120 \Configure{@HEAD}{\HCode{<meta name="generator" content="TeX4ht (http://www.cse.ohio-state.edu/~jim/TeX4ht/)>\Hnewline}}
121 \Configure{@HEAD}{\HCode{<meta name="ximera" content="version 0.0.1" /\Hnewline}}
122 \Configure{@HEAD}{\HCode{<link href="https://ximera.osu.edu/public/stylesheets/standalone.css">\Hnewline}}
123 \Configure{@HEAD}{\HCode{<script type="text/javascript" async src="https://ximera.osu.edu/public/js/ximera.js">\Hnewline}}
124 \end{cfgXimera}

```

Disable certain ligatures in HTML.

```

125 \begin{htXimera}
126 \usepackage{microtype}
127 \DisableLigatures[f]{encoding=*}
128 \end{htXimera}

```

I am not sure what this does.

```

129 \begin{htXimera}
130 \NewEnviron{html}{\HCode{\BODY}}
131 \end{htXimera}

```

## 2.4 Structure

### 2.4.1 Macros

Makes everymath display style even when inline, could be optional.

```
132 <*classXimera>
133 \everymath{\displaystyle}
134 </classXimera>
```

Ok not everything, we also need to configure “display style” limits.

```
135 <*classXimera>
136 \let\prelim\lim
137 \renewcommand{\lim}{\displaystyle\prelim}
138 </classXimera>
```

### 2.4.2 Theorem and theorem-like environments

On the web, a theorem is emitted as a special <div>.

```
139 <*htXimera>
140 \newcommand{\ConfigureTheoremEnv}[1]{%
141 \renewenvironment{#1}[1][\refstepcounter{problem}%
142 \ifthenelse{\equal{##1}{}}{}{}%
143 \HCode{<span class="theorem-like-title">}##1\HCode{</span>}}%
144 }{}
145 \ConfigureEnv{#1}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div class=
146 }
147 </htXimera>
148 <classXimera>\theoremstyle{definition} % No italic (because this makes also text in TikZ italic)
```

The key is to make sure that the theorem environments are defined in a corresponding fashion on the web and on paper.

theorem	Theorem	
	149 <classXimera>	\newtheorem{theorem}{Theorem}
	150 <htXimera>	\ConfigureTheoremEnv{theorem}
algorithm	Algorithm	
	151 <classXimera>	\newtheorem{algorithm}{Algorithm}
	152 <htXimera>	\ConfigureTheoremEnv{algorithm}
axiom	Axiom	
	153 <classXimera>	\newtheorem{axiom}{Axiom}
	154 <htXimera>	\ConfigureTheoremEnv{axiom}
claim	Claim	
	155 <classXimera>	\newtheorem{claim}{Claim}
	156 <htXimera>	\ConfigureTheoremEnv{claim}
conclusion	Conclusion	
	157 <classXimera>	\newtheorem{conclusion}{Conclusion}
	158 <htXimera>	\ConfigureTheoremEnv{conclusion}
condition	Condition	
	159 <classXimera>	\newtheorem{condition}{Condition}
	160 <htXimera>	\ConfigureTheoremEnv{condition}
conjecture	Conjecture	
	161 <classXimera>	\newtheorem{conjecture}{Conjecture}
	162 <htXimera>	\ConfigureTheoremEnv{conjecture}
corollary	Corollary	
	163 <classXimera>	\newtheorem{corollary}{Corollary}
	164 <htXimera>	\ConfigureTheoremEnv{corollary}
criterion	Criterion	
	165 <classXimera>	\newtheorem{criterion}{Criterion}
	166 <htXimera>	\ConfigureTheoremEnv{criterion}

definition	Definition	
	167 <code>\classXimera</code>	<code>\newtheorem{definition}{Definition}</code>
	168 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{definition}</code>
example	Example	
	169 <code>\classXimera</code>	<code>\newtheorem{example}{Example}</code>
	170 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{example}</code>
explanation	Explanation	
	171 <code>\classXimera</code>	<code>\newtheorem*{explanation}{Explanation}</code>
	172 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{explanation}</code>
fact	Fact	
	173 <code>\classXimera</code>	<code>\newtheorem{fact}{Fact}</code>
	174 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{fact}</code>
lemma	Lemma	
	175 <code>\classXimera</code>	<code>\newtheorem{lemma}{Lemma}</code>
	176 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{lemma}</code>
formula	Formula	
	177 <code>\classXimera</code>	<code>\newtheorem{formula}{Formula}</code>
	178 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{formula}</code>
idea	Idea	
	179 <code>\classXimera</code>	<code>\newtheorem{idea}{Idea}</code>
	180 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{idea}</code>
notation	Notation	
	181 <code>\classXimera</code>	<code>\newtheorem{notation}{Notation}</code>
	182 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{notation}</code>
model	Model	
	183 <code>\classXimera</code>	<code>\newtheorem{model}{Model}</code>
	184 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{model}</code>
observation	Observation	
	185 <code>\classXimera</code>	<code>\newtheorem{observation}{Observation}</code>
	186 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{observation}</code>
proposition	Proposition	
	187 <code>\classXimera</code>	<code>\newtheorem{proposition}{Proposition}</code>
	188 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{proposition}</code>
paradox	Paradox	
	189 <code>\classXimera</code>	<code>\newtheorem{paradox}{Paradox}</code>
	190 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{paradox}</code>
procedure	Procedure	
	191 <code>\classXimera</code>	<code>\newtheorem{procedure}{Procedure}</code>
	192 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{procedure}</code>
remark	Remark	
	193 <code>\classXimera</code>	<code>\newtheorem{remark}{Remark}</code>
	194 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{remark}</code>
summary	Summary	
	195 <code>\classXimera</code>	<code>\newtheorem{summary}{Summary}</code>
	196 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{summary}</code>
template	Template	
	197 <code>\classXimera</code>	<code>\newtheorem{template}{Template}</code>
	198 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{template}</code>
warning	Warning	
	199 <code>\classXimera</code>	<code>\newtheorem{warning}{Warning}</code>
	200 <code>\htXimera</code>	<code>\ConfigureTheoremEnv{warning}</code>

### 2.4.3 Enumerate fixes

Make enumerate use a letter

```
201 \*classXimera
202 \renewcommand{\theenumi}{\textup{(\alph{enumi})}}
203 \renewcommand{\labelenumi}{\theenumi}
204 \renewcommand{\theenumii}{\textup{(\roman{enumii})}}
205 \renewcommand{\labelenumii}{\theenumii}
206 \*classXimera
```

### 2.4.4 Proofs

**proof** A mathematical proof environment.

```
207 \*classXimera
208 \renewcommand{\qedsymbol}{\blacksquare}
209 \renewenvironment{proof}[1][\proofname]
210 {\begin{trivlist}\item[\hspace{\labelsep}\itshape\bfseries #1]{\hspace{2ex}}}
211 {\qed\end{trivlist}}
212 \*classXimera
```

### 2.4.5 Problem environments

These are problem environment decorations (these should be user invoked, not default). The decoration for these environments were inspired by <http://tex.stackexchange.com/questions/11098/nice-formatting-for-theorems>

```
213 \*classXimera
```

**latexProblemContent** Added for those that want to use UF problems without using the problem filter code. This command is renewed into something meaningful in the 'ProblemSelector.sty'.

```
214 \providecommand{\latexProblemContent}[1]{#1}
215 % Iterate count for problem counts.
216 \Make@Counter{Iteration@probCnt}

217 \newcommand{\hang}{% top theorem decoration
218   \begingroup%
219   \setlength{\unitlength}{.005\linewidth}% \linewidth/200
220   \begin{picture}(0,0)(1.5,0)%
221     \linethickness{1pt} \color{black!50}%
222     \put(-3,2){\line(1,0){206}}% Top line
223     \multido{\iA=2+-1,\iB=50+-10}{5}{% Top hangs
224       \color{black!\iB}%
225       \put(-3,\iA){\line(0,-1){1}}% Top left hang
226       \put(203,\iA){\line(0,-1){1}}% Top right hang
227     }%
228   \end{picture}%
229   \endgroup%
230 }%

231 \newcommand{\hung}{% bottom theorem decoration
232   \nobreak
233   \begingroup%
234   \setlength{\unitlength}{.005\linewidth}% \linewidth/200
235   \begin{picture}(0,0)(1.5,0)%
236     \linethickness{1pt} \color{black!50}%
237     \put(60,0){\line(1,0){143}}% Bottom line
238     \multido{\iA=0+1,\iB=50+-10}{5}{% Bottom hangs
239       \color{black!\iB}%
240       \put(-3,\iA){\line(0,1){1}}% Bottom left hang
241       \put(203,\iA){\line(0,1){1}}% Bottom right hang
242       \put(\iB,0){\line(60,0){10}}% Left fade out
243     }%
244   \end{picture}%
245   \endgroup%
246 }%
```

Configure environment configuration commands

The command `\problemNumber` contains all the format code to determine the number (and the format of the number) for any of the problem environments.

```

247 \MakeCounter{problem}
248 \newcommand{\problemNumber}{
249 % First we determine if we have a counter for this question depth level.
250 \ifcsname c@depth\Roman{problem@Depth}Count\endcsname% Check to see if counter exists
251 %If so, do nothing.
252 \else
253 %If not, create it.
254 \expandafter\newcounter{depth\Roman{problem@Depth}Count}
255 \expandafter\setcounter{depth\Roman{problem@Depth}Count}{0}
256 \fi
257
258 \expandafter\stepcounter{depth\Roman{problem@Depth}Count}
259 \arabic{depthICount}% The first problem depth, what use to be |\theproblem|.
260
261 \forloop{Iteration@probCnt}{2}{\arabic{Iteration@probCnt} < \numexpr \value{problem@Depth} +
262   \expandafter\arabic{depth\Roman{Iteration@probCnt}Count}% Get the problem number of the
263 }
264 %\@ifpackageloaded{shuffle}{<true>}{<false>}% Check if Shuffle has been added. If so, add sp
265 %\ifhandout % Currently handout mode doesn't allow hints. Putting this code in place in case
266 % \theproblem
267 %\else
268 % \theproblem
269 %\fi
270 }
271
272
273 %%%% Configure various problem environment commands
274 \Make@Counter{problem@Depth}
275
276
277
278 %%%% Configure environments start content
279
280 \newcommand{\problemEnvironmentStart}[2]{%
281 % This takes in 2 arguments.
282 % The first is optional and is the old optional argument from existing environments.
283 % This is passed down to the associated problem environment name in case you want a global v
284 % The second argument is mandatory and is the name of the 'problem' environment,
285 % such as problem, question, exercise, etc.
286 % It then configures everything needed at the start of that environment.
287
288 \stepcounter{problem@Depth}% Started a problem, so we've sunk another problem layer.
289 \def\spaceatend{#1}%
290 \begin{trivlist}%
291 \item%
292 [%
293   \hskip\labelsep\sffamily\bfseries
294   #2 \problemNumber% Determine the correct number of the problem, and the format of that n
295 ]%
296 \slshape
297 }
298
299
300
301 %%%% Configure environments end content
302
303 \newcommand{\problemEnvironmentEnd}{%This configures all the end content for a problem.
304 %
305 % First we need to see if we've dropped fully out of a depth level,
306 % so we can reset that counter back to zero for the next time we enter that depth level.

```



```

307 \stepcounter{problem@Depth}
308 \ifcsname c@depth\Roman{problem@Depth}Count\endcsname
309 \expandafter\ifnum\expandafter\value{depth\Roman{problem@Depth}Count}>0
310 \expandafter\setcounter{depth\Roman{problem@Depth}Count}{0}
311 \fi
312 \fi
313
314 \addtocounter{problem@Depth}{-2}% Exited a problem so we've exited a problem layer. Need -2 h
315
316 \par\addvspace{.5ex}\nobreak\noindent\hung %% line at the bottom
317
318 \ifhandout
319 \ifnewpage
320 \newpage
321 \fi
322 \fi
323 \end{trivlist}
324 }
325
326
327
328 %%% Now populate the old environment names
329 %
330 % Old environments were "problem", "exercise", "exploration", and "question".
331 % Note that you can add content to the start/end code on top of these base code pieces if you
332
333
334 \newenvironment{problem}[1][2in]%
335 {%Env start code
336 \problemEnvironmentStart{#1}{Problem}
337 }
338 {%Env end code
339 \problemEnvironmentEnd
340 }
341
342 \newenvironment{exercise}[1][2in]%
343 {%Env start code
344 \problemEnvironmentStart{#1}{Exercise}
345 }
346 {%Env end code
347 \problemEnvironmentEnd
348 }
349
350 \newenvironment{exploration}[1][2in]%
351 {%Env start code
352 \problemEnvironmentStart{#1}{Exploration}
353 }
354 {%Env end code
355 \problemEnvironmentEnd
356 }
357
358 \newenvironment{question}[1][2in]%
359 {%Env start code
360 \problemEnvironmentStart{#1}{Question}
361 }
362 {%Env end code
363 \problemEnvironmentEnd
364 }
365 </classXimera>

```

Use an “identification” counter to assign IDs to the various problem-related DOM elements

```

366 <#htXimera>
367 \newcounter{identification}

```

```

368 \setcounter{identification}{0}
369
370 \newcommand{\ConfigureQuestionEnv}[2]{%
371 % refstepcounter ensures that labels get updated within these environments
372 \renewenvironment{#1}{\refstepcounter{problem}}{}%
373 \ConfigureEnv{#1}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div role="
374 }
375
376 \ConfigureQuestionEnv{problem}{problem}
377 \ConfigureQuestionEnv{exercise}{exercise}
378 \ConfigureQuestionEnv{question}{question}
379 \ConfigureQuestionEnv{exploration}{exploration}
380 \ConfigureQuestionEnv{hint}{hint}
381 %%%\ConfigureQuestionEnv{shuffle}{shuffle}
382 </htXimera>

```

### 2.4.6 Hints

**hint** Hint environments can be embedded inside problems.

```

383 <classXimera>

```

Create a counter that will track how deeply nested the current hint is

```

384 \newcounter{hintLevel}
385 \setcounter{hintLevel}{0}

```

Create an empty shell to renew

```

386 \newenvironment{hint}{}{}

```

Now we renew the environment as needed, this should allow support for any transition code that treats some parts as a "handout" and some parts as non-handout. renewing the environment on the fly is a bit hacky.

```

387 \renewenvironment{hint}
388 {
389 \ifhandout
390 \setbox0\vbox\bgroup
391 \else
392 \begin{trivlist}\item[\hskip \labelsep\small\slshape\bfseries Hint:\hspace{2ex}]
393 \small\slshape
394 \fi

```

Step up hint level to track the nested level of the hint. This will be used for problem numbering.

```

395 \stepcounter{hintLevel}
396 }
397 {
398 \ifhandout
399 \egroup\ignorespacesafterend
400 \else
401 \end{trivlist}
402 \fi

```

Detract from hint level counter to track hint nested level

```

403 \addtocounter{hintLevel}{-1}
404 }
405
406 \ifhints
407 \renewenvironment{hint}{
408 \begin{trivlist}\item[\hskip \labelsep\small\slshape\bfseries Hint:\hspace{2ex}]
409 \small\slshape
410 {\end{trivlist}}
411 \fi
412
413 </classXimera>

```

### 2.4.7 Solution

**solution** The solution to a problem.

```

414 <*classXimera>
415 %% solution environment
416 \ifhandout % what follows is handout behavior
417 \newenvironment{solution}%
418     {%
419     \setbox0\vbox\bgroup
420     }
421     {%
422     \egroup
423     }
424 \else
425 \newenvironment{solution}%
426     {%
427     \begin{trivlist}
428     \item[\hspace{\labelsep}\bfseries Solution:\hspace{2ex}]
429     }
430     % %% line at the bottom}
431     {
432     \end{trivlist}
433     \par\addvspace{.5ex}\nobreak\noindent\hung
434     }
435 \fi
436
437
438
439 </classXimera>

```

### 2.4.8 Code listing environments

**code** A code answer environment You cannot use Environ with the fancyvrb/listings package if you want nested environments.

```

440 <*classXimera>
441 \DefineVerbatimEnvironment{code}{Verbatim}{numbers=left,frame=lines,label=Code,labelposition=
442 </classXimera>

```

**python** A python answer environment You cannot use Environ with the fancyvrb/listings package if you want nested environments

```

443 <*classXimera>
444 \DefineVerbatimEnvironment{python}{Verbatim}{numbers=left,frame=lines,label=Python,labelposition=
445 </classXimera>

```

**javascriptCode** A JavaScript answer environment Unfortunately the name javascript is already used for the actual, executed (!) JavaScript interactive. environments

```

446 <*classXimera>
447 \DefineVerbatimEnvironment{javascriptCode}{Verbatim}{numbers=left,frame=lines,label=JavaScript
448 </classXimera>
449 <*cfgXimera>
450 \renewenvironment{javascriptCode}{\NoFonts}{\EndNoFonts}
451 \ScriptEnv{javascriptCode}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<d
452 </cfgXimera>

```

On the web, translate verbatim and lstlisting blocks into <pre> elements.

```

453 <*cfgXimera>
454 \ConfigureEnv{verbatim}{\HCode{<pre>}}{\HCode{</pre>}}{}{}
455 \ConfigureEnv{lstlisting}{\HCode{<pre>}}{\HCode{</pre>}}{}{}
456 </cfgXimera>

```

### 2.4.9 Dialogues

**dialogue** A dialogue between people.

```

457 <*classXimera>

```

```

458 \newenvironment{dialogue}{%
459   \renewcommand\descriptionlabel[1]{\hspace{\labelsep}\textbf{##1:}}
460   \begin{description}%
461 }{%
462   \end{description}%
463 }
464 \end{classXimera}

```

On the web, the resulting <dl> should have an appropriate class set.

```

465 \begin{htXimera}
466 \renewenvironment{dialogue}{\begin{description}}{\end{description}}
467
468 \ConfigureList{dialogue}%
469   {\EndP\HCode{<dl \a:LRdir class="dialogue">}}%
470   \PushMacro\end:itm
471 \global\let\end:itm=\empty
472   {\PopMacro\end:itm \global\let\end:itm \end:itm \end:itm
473 \EndP\HCode{</dd></dl>}\ShowPar}
474   {\end:itm \global\def\end:itm{\EndP\Tg</dd>}\HCode{<dt
475     class="actor">}\bgroup \bf}
476   {\egroup\EndP\HCode{</dt><dd\Hnewline class="speech">}}
477 \end{htXimera}

```

#### 2.4.10 Instructor notes

```

478 \begin{classXimera}
479
480 %% instructor intro/instructor notes
481 %%
482 \ifhandout % what follows is handout behavior
483 \ifinstructornotes
484 \newenvironment{instructorIntro}%
485   {%
486   \begin{trivlist}
487   \item[\hspace{\labelsep}\bfseries Instructor Introduction:\hspace{2ex}]
488   }
489   % %% line at the bottom}
490   {
491   \end{trivlist}
492   \par\addvspace{.5ex}\nobreak\noindent\hung
493   }
494 \else
495 \newenvironment{instructorIntro}%
496   {%
497   \setbox0\vbox\bgroup
498   }
499   {%If this mysteriously starts breaking
500     % remove \ignorespacesafterend
501   \egroup\ignorespacesafterend
502   }
503   \fi
504 \else% for handout, so what follows is default
505 \ifinstructornotes
506 \newenvironment{instructorIntro}%
507   {%
508   \setbox0\vbox\bgroup
509   }
510 {%
511   \egroup
512 }
513   \else
514   \newenvironment{instructorIntro}%
515 {%
516   \begin{trivlist}

```

```

517 \item[\hskip \labelsep\bfseries Instructor Introduction:\hspace{2ex}]
518 }
519 % %% line at the bottom}
520 {
521 \end{trivlist}
522 \par\addvspace{.5ex}\nobreak\noindent\hung
523 }
524 \fi
525 \fi
526
527
528
529
530 %% instructorNotes environment
531 \ifhandout % what follows is handout behavior
532 \ifinstructornotes
533 \newenvironment{instructorNotes}%
534 {
535 \begin{trivlist}
536 \item[\hskip \labelsep\bfseries Instructor Notes:\hspace{2ex}]
537 }
538 % %% line at the bottom}
539 {
540 \end{trivlist}
541 \par\addvspace{.5ex}\nobreak\noindent\hung
542 }
543 \else
544 \newenvironment{instructorNotes}%
545 {
546 \setbox0\vbox\bgroup
547 }
548 {
549 \egroup
550 }
551 \fi
552 \else% for handout, so what follows is default
553 \ifinstructornotes
554 \newenvironment{instructorNotes}%
555 {
556 \setbox0\vbox\bgroup
557 }
558 {
559 \egroup
560 }
561 \else
562 \newenvironment{instructorNotes}%
563 {
564 \begin{trivlist}
565 \item[\hskip \labelsep\bfseries Instructor Notes:\hspace{2ex}]
566 }
567 % %% line at the bottom}
568 {
569 \end{trivlist}
570 \par\addvspace{.5ex}\nobreak\noindent\hung
571 }
572 \fi
573 \fi
574
575 </classXimera>

```

#### 2.4.11 Only

prompt The prompt part for mathmode

```
576 <math>

```

```

577 \ifxake
578     \newenvironment{prompt}{}{}
579 \else
580 \ifhandout
581 \NewEnviron{prompt}{}
582 % Currently breaks when put in mathmode!
583 % \newenvironment{prompt}{\suppress}{\endsuppress}
584 \else
585 \newenvironment{prompt}
586     {\bgroup\color{gray!50!black}}
587     {\egroup}
588 \fi
589 \fi

onlineOnly    Only display it online

590 \ifhandout
591 \NewEnviron{onlineOnly}{
592 \iftikzexport
593 \BODY
594 \else
595 \fi
596 }
597 \else
598 \newenvironment{onlineOnly}
599     {\bgroup\color{red!50!black}}
600 {\egroup}
601 \fi
602
603 \newcommand{\pdfOnly}[1]{\iftikzexport\else #1\fi}
604 \end{classXimera}

```

#### 2.4.12 Foldable

The package `mdframed` is used to make pretty foldable, but the `amsthm/mdframed` conflict also messes up the `.jax` file so we don't load `mdframed` when performing the `xake` step. But even the below isn't enough to fix this.

```

605 %\iftikzexport\else\RequirePackage[framemethod=TikZ]{mdframed}\fi

foldable    Does it fold?

606 \classXimera
607
608 \colorlet{textColor}{black} % since textColor is referenced below
609 \colorlet{background}{white} % since background is referenced below
610
611 % The core environments. Find results in 4ht file.
612 %% pretty-foldable
613 %\iftikzexport
614 \newenvironment{foldable}{%
615 }{%
616 }
617 %\else
618 %\renewmdenv[
619 % font=\upshape,
620 % outerlinewidth=3,
621 % topline=false,
622 % bottomline=false,
623 % leftline=true,
624 % rightline=false,
625 % leftmargin=0,
626 % innertopmargin=0pt,
627 % innerbottommargin=0pt,
628 % skipbelow=\baselineskip,
629 % linecolor=textColor!20!white,
630 % fontcolor=textColor,

```

```

631 % backgroundcolor=background
632 %]{foldable}%
633 %\fi
634
635 %% pretty-expandable
636 %\iftikzexport
637 \newenvironment{expandable}{%
638 }{%
639 }
640 %\else
641 %\newmdenv[
642 % font=\upshape,
643 % outerlinewidth=3,
644 % topline=false,
645 % bottomline=false,
646 % leftline=true,
647 % rightline=false,
648 % leftmargin=0,
649 % innertopmargin=0pt,
650 % innerbottommargin=0pt,
651 % skipbelow=\baselineskip,
652 % linecolor=black,
653 %]{expandable}%
654 %\fi
655
656 \newcommand{\unfoldable}[1]{#1}
657
658 \end{classXimera}

```

On the web, these foldable elements could be HTML5 details and summary.

```

659 \begin{htXimera}
660 \renewenvironment{foldable}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">}}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{</div>}}
661
662 \renewenvironment{expandable}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;">}}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{</div>}}
663
664 \end{htXimera}
665
666 \renewcommand{\unfoldable}[1]{\HCode{<span class="unfoldable">#1\HCode{</span>}}}
667 \end{htXimera}

```

### 2.4.13 Leashes

**leash** Put content inside a scrollable box.

```

668 \begin{classXimera}
669
670 \newenvironment{leash}[1]{%
671 }{%
672 }
673
674
675 \end{classXimera}
676
677 \begin{htXimera}
678 \renewenvironment{leash}[1]{\ifvmode \IgnorePar\fi \EndP\HCode{<div style="overflow: auto; height: 100px; border: 1px solid black; padding: 5px;">}}{\ifvmode \IgnorePar\fi \EndP\HCode{</div>}}
679 \end{htXimera}

```

## 2.5 Document metadata

### 2.5.1 Metadata

To encourage authors to include relevant parseable metadata in the preamble, we define some currently ignored commands.

**\license** In the preamble, use **\license** with an SPDX license expression.

```

679 \begin{classXimera}

```

```

680 \newcommand{\license}{\excludecomment}
681 \end{classXimera}

\acknowledgement    In the preamble, use \acknowledgement to credit others who contributed to the
                    intellectual content beside the author.

682 \begin{classXimera}
683 \newcommand{\acknowledgement}{\excludecomment}
684 \end{classXimera}

\tag                In the preamble, a \tag provides a free-form taxonomy.

685 \begin{classXimera}
686 \renewcommand{\tag}{\excludecomment}
687 \end{classXimera}

On the HTML side, we mark the file as the appropriate kind of object—either activity
or xourse.

688 \begin{htXourse}
689 % Mark this as a xourse file
690 \Configure{@HEAD}{\HCode{<meta name="description" content="xourse" />\Hnewline}}
691 \end{htXourse}

```

## 2.5.2 Abstract

```

abstract    Every activity should include a short abstract.

692 \begin{classXimera}
693 \let\abstract\relax
694 \let\endabstract\relax
695 % Use of environ package, may want to find a better way.
696 \NewEnviron{abstract}{\protected@xdef\theabstract{\BODY}}
697 \end{classXimera}

```

The abstract has been stored in `\theabstract` and should be emitted as a div. The code below is required for the abstract to show online.

```

698 \begin{cfgXimera}
699 \let\abstract\relax
700 \let\endabstract\relax
701 \end{cfgXimera}

```

## 2.5.3 Titles and authors

### 2.5.4 Authors

```

\author    Activities have authors. Warn the user if no author is provided.

702 \begin{classXimera}
703 \let\emptyauthor\@author
704 \def\author#1{\gdef\author{#1}}
705 \def\@author{\@latex@warning@no@line{No \noexpand\author given}}
706 \end{classXimera}

```

Include author name in meta tags

```

707 \begin{htXimera}
708 \Configure{@HEAD}{\HCode{<meta name="author" content="\@author\HCode{" />\Hnewline}}
709 \end{htXimera}

```

The `\and` command would emit tabular environments which really should not appear in a meta tag.

```

710 \begin{htXimera | classXimera} \def\and{and }

```

### 2.5.5 Title

```

\title    Activities have titles.

711 \begin{classXimera}
712 \let\title\relax
713 \newcommand{\title}[1] []{{\protected@xdef\@prettitle{#1}}\protected@xdef\@title{
714

```



```

715 \title{}
716
717 \newcounter{titlenumber}
718 \renewcommand{\thetitlenumber}{\arabic{titlenumber}}
719 %\renewcommand{\thesection}{\arabic{titlenumber}} %% Makes section numbers work
720 \setcounter{titlenumber}{0}
721
722 \newpagestyle{main}{
723 \sethead[\textsl{\ifnumbers\thetitlenumber\hspace{1em}\fi\@title}][]{} % even
724 {}{}{\textsl{\ifnumbers\thetitlenumber\hspace{1em}\fi\@title}} % odd
725 \setfoot[\thepage]{}{} % even
726 {}{}{\thepage} % odd
727 }
728 \pagestyle{main}

\maketitle In a ximera document, redefine \maketitle and put them in a table of contents. The
\phantomsection is to fix the hrefs.

729 \renewcommand\maketitle{%
730 \addtocounter{titlenumber}{1}%
731 {\flushleft\large\bfseries \@pretitle\par\vspace{-1em}}
732 {\flushleft\LARGE\bfseries {\ifnumbers\thetitlenumber\fi}{\ifnumbers\hspace{1em}\else\hspa
733 \phantomsection%
734 \ifnumbers\addcontentsline{toc}{section}{\thetitlenumber~\@title}\else\addcontentsline{toc}
735 \vskip .6em\noindent\textit{theabstract}\setcounter{problem}{0}\setcounter{section}{0}\setco
736 \ifnooutcomes\else\let\thefootnote\relax\footnote{Learning outcomes: \theoutcomes}\fi
737 \ifnoauthor\else\let\thefootnote\relax\footnote{Author(s):~\@author}\fi
738 \aftergroup\@afterindentfalse
739 \aftergroup\@afterheading}
740
741 \ifnumbers
742 \setcounter{secnumdepth}{2}
743 \renewcommand{\thesection}{\arabic{titlenumber}.\arabic{section}}
744 \renewcommand{\thesubsection}{\arabic{titlenumber}.\arabic{section}.\arabic{subsection}}
745 \else
746 \setcounter{secnumdepth}{-2}
747 \fi
748
749 \def\activitystyle{}
750 \newcounter{sectiontitlenumber}
751 \setcounter{secnumdepth}{2}
752 \setcounter{tocdepth}{2}
753 \newcommand\chapterstyle{%
754 \def\activitystyle{activity-chapter}
755 \def\maketitle{%
756 \addtocounter{titlenumber}{1}%
757 {\flushleft\small\sffamily\bfseries\@pretitle\par\vspace{-1.5em}}%
758 {\flushleft\LARGE\sffamily\bfseries\thetitlenumber\hspace{1em}\@title \p
759 {\vskip .6em\noindent\textit{theabstract}\setcounter{problem}{0}\setcount
760 \par\vspace{2em}
761 \phantomsection\addcontentsline{toc}{section}{\textbf{\thetitlenumber\hsp
762 }}
763
764
765 \newcommand\sectionstyle{%
766 \def\activitystyle{activity-section}
767 \def\maketitle{%
768 \addtocounter{section}{1}
769 \setcounter{sectiontitlenumber}{\value{section}}
770 {\flushleft\small\sffamily\bfseries\@pretitle\par\vspace{-1.5em}}%
771 {\flushleft\Large\sffamily\bfseries\thetitlenumber.\thesectiontitlenumber\hspace{1em}\@t
772 {\vskip .6em\noindent\textit{theabstract}\setcounter{subsection}{0}}%
773 \par\vspace{2em}
774 \phantomsection\addcontentsline{toc}{section}{\thetitlenumber.\thesectiontitlenumber\hsp
775 \renewcommand\section{\@startsection{subsection}{2}{\z@}%

```

```

776             {-3.25ex\@plus -1ex \@minus -.2ex}%
777             {1.5ex \@plus .2ex}%
778             {\normalfont\large\bfseries}}
779
780 \renewcommand\subsection{\@startsection{subsubsection}{3}{\z@}%
781             {-3.25ex\@plus -1ex \@minus -.2ex}%
782             {1.5ex \@plus .2ex}%
783             {\normalfont\normalsize\bfseries}}
784
785 }}
786
787
788 \iftikzexport%% allows xake to handle \chapterstyle and \sectionstyle
789 \renewcommand\chapterstyle{\def\activitystyle{chapter}}
790 \renewcommand\sectionstyle{\def\activitystyle{section}}
791 \else
792 \fi
793
794 \end{classXimera}

```

Eliminate some formatting that we'll handle later with CSS

```

795 \end{htXimera}
796 \renewcommand{\maketitle}{}
797 \end{htXimera}

```

## 2.5.6 Learning Outcomes

`\outcome` Specify a learning outcome, either at the level of a problem or an entire document in the preamble.

```

798 \begin{classXimera}
799 \def\theoutcomes{}
800
801 \ifdefined\HCode%
802 \newcommand{\outcome}[1]{}
803 \else%
804 \newwrite\outcomefile
805 \immediate\openout\outcomefile=\jobname.oc
806
807 \newcommand{\outcome}[1]{\edef\theoutcomes{\theoutcomes #1~}%
808 \immediate\write\outcomefile{\unexpanded{\outcome}{#1}}}
809 \fi%
810 \end{classXimera}

```

These can appear in either the preamble or in problem environments. with pdf<sub>l</sub>atex, we produce the .oc file which includes ALL the outcomes; in the tex4ht world, we just produce spans for the specific outcomes.

```

811 \begin{cfgXimera}
812 \renewcommand{\outcome}[1]{
813 \Configure{@HEAD}{\HCode{<meta name="learning-outcome" content="#1"/>\Hnewline}}
814 }
815 % Sometimes there are no outcomes at all
816 \IfFileExists{\jobname.oc}{\input{\jobname.oc}}{}
817
818 \renewcommand{\outcome}[1]{%
819 \HCode{<span class="learning-outcome">#1</span>}
820 }
821 \end{cfgXimera}

```

## 2.5.7 Labels and references

`\label` Labels and refs both generate anchors. A `\label` can be referenced from any file in the xourse.

```

822 \begin{htXimera}

```

```

823 \let\oldlabel\label
824 \renewcommand{\label}[1]{\oldlabel{#1}\HCode{<a class="ximera-label" id="#1"></a>}}
825 \end{Ximera}

\ref A \ref can connect one TeX file to another if they are in the same xourse.
826 \end{Ximera}
827 \renewcommand{\ref}[1]{\HCode{<a class="reference" href="#1">#1</a>}}
828 \end{Ximera}

```

## 2.6 Images

### 2.6.1 Images

**image** Place images inside an **image** environment. On paper, this centers the image. On the web, this provides additional benefits.

```

829 \begin{Ximera}
830 \newenvironment{image}[1][]{\begin{center}}{\end{center}}
831 \NewEnviron{image}[1][3in]{%
832   \begin{center}\resizebox{#1}{!}{\BODY}\end{center}% resize and center
833 }
834 \end{Ximera}

```

**\alt** Inside an **image** environment, **\alt** provides alt-text for assistive technology like screen-readers.

```

835 \begin{Ximera}
836 \newcommand{\alt}[1]{}
837 \end{Ximera}

```

The **image** environment doesn't actually work in tex4ht as defined with **NewEnviron**; so this **renewenvironment** is needed. **image-environment** also gets formatted in a well, and when the user clicks on the image, it zooms in.

```

838 \begin{Ximera}
839 \newcounter{imagealt}
840 \setcounter{imagealt}{0}
841 \renewenvironment{image}[1][]{\stepcounter{imagealt}%
842   \ifvmode \IgnorePar\fi \EndP%
843   \HCode{<div class="image-environment" role="img" aria-labelledby="image-alt-\arabic{imagealt}">}}
844 \end{Ximera}
845 \renewcommand{\alt}[1]{\HCode{<div style="display: none;" id="image-alt-\arabic{imagealt}">}}
846 \end{Ximera}

```

Although we accept many formats, SVG is preferred on the web. Since we have a different mechanism for producing alt text, we want to ignore tex4ht's own method for producing alt text.

```

847 \begin{Ximera}
848 \DeclareGraphicsExtensions{.jpg,.png,.gif,.svg}
849 \Configure{graphics*}
850 {svg}{
851   \Configure{Needs}{File: \Gin@base.svg}\Needs{}}
852 \Picture[]{\csname Gin@base\endcsname.svg \csname a:Gin-dim\endcsname}%
853 }
854 \end{Ximera}

```

This is a hack to kill **includegraphics** commands in **\documentclass{standalone}** files

```

855 \begin{Ximera}
856 \ifcsname ifstandalone\endcsname
857   \ifstandalone
858     \renewcommand\includegraphics[2][]{ }
859   \fi
860 \end{Ximera}

```

PGF sometimes causes trouble, but we simply don't care in tex4ht mode.

```

861 \begin{Ximera}
862 \newcommand{\pgfsyspdfmark}[3]{}
863 \end{Ximera}

```

### 2.6.2 TikZ export

We generate SVGs and PNGs for any TikZ images, via the “externalize” feature of TikZ.

Currently TikZ doesn’t compile natively into the website because of how the xake bake compilation works. In order to make Tikz work, you need to get the tool `mutool` on the machine that is performing `xake bake`.

```
864 <*classXimera>
865 \ifdefined\HCode
866   \tikzexporttrue
867 \fi
868
869 \iftikzexport
870   \usetikzlibrary{external}
871
872   \ifdefined\HCode
873     % in htlatex, just include the svg files
874     \def\pgfsys@imagesuffixlist{.svg}
875
876     \tikzexternalize[prefix=./,mode=graphics if exists]
877   \else
878     % in pdflatex, actually generate the svg files
879     \tikzset{
880       /tikz/external/system call={
881         pdflatex \tikzexternalcheckshellescape
882         -halt-on-error -interaction=batchmode
883         -jobname "\image" "\PassOptionsToClass{tikzexport}{ximera}\texsource";
884         mutool draw -F svg \image.pdf > \image.svg ;      % mutool adds "1" to filename ???
885         mutool draw -o \image.svg \image.pdf ;
886         mutool draw -r 150 -c rgbalpha -o \image.png \image.pdf ;
887         ebb -x \image.png
888       }
889     }
890     \tikzexternalize[optimize=false,prefix=./]
891   \fi
892
893 \fi
894
895 </classXimera>
```

### 2.6.3 XKCD

`\xkcd` Reference an XKCD cartoon.

```
896 <*classXimera>
897 \newcommand{\xkcd}[1]{#1}
898 </classXimera>
```

On the web, this should be an image linked to the actual XKCD website.

```
899 <*htXimera>
900 \renewcommand{\xkcd}[1]{\ifvmode \IgnorePar\fi \EndP\HCode{`

## 2.8.4 Desmos

`\desmos` Desmos command. Requires id, width, and height as arguments.

958 `<*classXimera>`

959 `\newcommand{\desmos}[3]{Desmos link: \url{https://www.desmos.com/calculator/#1}}`

960 `\newcommand{\desmosThreeD}[3]{Desmos3D link: \url{https://www.desmos.com/3d/#1}}`

961 `</classXimera>`

962 `<*htXimera>`

963 `\renewcommand{\desmos}[3]{\HCode{<iframe src="https://www.desmos.com/calculator/#1" width="100% height="100px">}}`

964 `\renewcommand{\desmosThreeD}[3]{\HCode{<iframe src="https://www.desmos.com/3d/#1" width="#2px height="#3px">}}`

965 `</htXimera>`

## 2.8.5 Graphs

`\graph` An embedded graph (in math mode).

966 `<*classXimera>`

967 `\newcommand{\graph}[2][\text{Graph of } \mathbb{R}^2]`

968 `</classXimera>`

969 `<*htXimera>`

970 `\renewcommand{\graph}[2][\HCode{<div class="graph" data-options="#1">#2\HCode{</div>}}`

971 `</htXimera>`

## 2.8.6 Video

`\youtube` Youtube command. Requires id.

972 `<*classXimera>`

973 `\newcommand{\youtube}[1]{YouTube link: \url{https://www.youtube.com/watch?v=#1}}`

974 `</classXimera>`

975 `<*htXimera>`

976 `\renewcommand{\youtube}[1]{\ifvmode \IgnorePar\fi \EndP\HCode{<div class="video youtube-play" data-id="#1">}}`

977 `</htXimera>`

Video commands are also emitted, slightly differently, when placed at top-level in a xourse file.

978 `<*htXourse>`

979 `\renewcommand{\youtube}[1]{%`

980 `\ifvmode \IgnorePar\fi \EndP\HCode{<a class="youtube" href="https://www.youtube.com/watch?v=#1">}}`

981 `}`

982 `</htXourse>`

## 2.8.7 JavaScript

`javascript` Code inside a javascript environment is printed on paper, but executed on the web.

983 `<*classXimera>`

984 `\DefineVerbatimEnvironment{javascript}{Verbatim}{numbers=left,frame=lines,label=JavaScript,language=JavaScript}`

985 `</classXimera>`

986 `<*htXimera>`

987 `% for programming javascript`

988 `\renewenvironment{javascript}{\NoFonts}{\EndNoFonts}`

989 `\ScriptEnv{javascript}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div class="javascript" data-id="#1">}}`

990 `</htXimera>`

`\js` Code inside a `\js` macro is evaluated and replaced with its value.

991 `<*classXimera>`

992 `\def\js#1{\mbox{\texttt{\detokenize{#1}}}}`

993 `</classXimera>`

994 `<*htXimera>`

995 `\def\js#1{\stepcounter{identification}\HCode{<span class="inline-javascript" id="javascript-#1">}}`

996 `</htXimera>`

## 2.9 SageMath support

Load SageTeX if it exists.

```
997 \*classXimera
998 \IfFileExists{sagetex.sty}{\RequirePackage{sagetex}}{}
999 \endclassXimera
```

**sageCell** Create an interactive SageMath widget.

```
1000 \*classXimera
1001 \DefineVerbatimEnvironment{sageCell}{Verbatim}{numbers=left,frame=lines,label=SAGE,labelposition=left}
1002 \endclassXimera

1003 \*htXimera
1004 \renewenvironment{sageCell}{\NoFonts}{\EndNoFonts}
1005 \ScriptEnv{sageCell}{\ifvmode \IgnorePar\fi \EndP\HCode{<div class="sage"><script type="text/javascript">
1006 \end{script}</div>}}{\fi}
```

**sageOutput** Execute SageMath code and output the result.

```
1007 \*classXimera
1008 \DefineVerbatimEnvironment{sageOutput}{Verbatim}{numbers=left,frame=lines,label=SAGE-Output,labelposition=left}
1009 \endclassXimera

1010 \*htXimera
1011 \renewenvironment{sageOutput}{\NoFonts}{\EndNoFonts}
1012 \ScriptEnv{sageOutput}{\ifvmode \IgnorePar\fi \EndP\HCode{<div class="sageOutput"><script type="text/javascript">
1013 \end{script}</div>}}{\fi}
```

**sageSilent** Execute SageMath code without outputting the result.

```
1014 \*htXimera
1015 %%%
1016 \renewenvironment{sagesilent}{\NoFonts}{\EndNoFonts}
1017 \ScriptEnv{sagesilent}{\ifvmode \IgnorePar\fi \EndP\HCode{<script type="text/sagemath">}}{\fi}
1018 \end{script}</div>}}{\fi}
```

## 2.10 Answerables

### 2.10.1 Answers

**\answer** A math answer

```
1019 \*classXimera
1020
1021 \ifdefined\HCode
1022 \newcommand{\recordvariable}[1]{}
1023 \else
1024 \newwrite\idfile
1025 \immediate\openout\idfile=\jobname.ids
1026 \newcommand{\recordvariable}[1]{\ifthenelse{\equal{#1}{}}{\fi}{\immediate\write\idfile{var #1;}}}
1027 \fi
```

Determines if answer is shown in handout mode. when `given=true`, show answer in handout mode, show answer in “given box” outside handout mode. When `given=false`, do not show answer in handout mode, show answer outside handout mode

```
1028 \define@key{answer}{given}[true]{\def\ans@given{#1}}
```

Used for setting numeric answer tolerance for online student input.

```
1029 \define@key{answer}{tolerance}{\def\ans@tol{#1}}
```

Used to run dynamic js code on student provided answers. Note: currently pdf outputs the validator code itself.

```
1030 \define@key{answer}{validator}{}

```

Used for assigning a js ID to answer for dynamic code (eg validators).

```
1031 \define@key{answer}{id}{\def\ans@id{#1}}
```

Used to set anticipated input format; eg “string”.

```
1032 \define@key{answer}{format}{}

```

Used to hide the answer input box on the web.

```
1033 \define@key{answer}{onlinenoinput}[false]{}

```

Used to add a ‘show answer’ button to the answer blank.

```
1034 \define@key{answer}{onlineshowanswerbutton}[false]{}

```

Set default values for `\answer` command key=value pairs. Default values are given = false.

```
1035 \setkeys{answer}{id=,given=false,onlinenoinput=false,onlineshowanswerbutton=false}

```

Basic code for `\answer`.

```
1036

```

```
1037 % Options for handout

```

```
1038 \newcommand{\answerFormatLength}{2cm}

```

```
1039

```

```
1040 \newcommand{\answerFormatDots}[1]{\ldots\ldots}

```

```
1041 \newcommand{\answerFormatLine}[1]{\protect\rule{\answerFormatLength}{0.4pt}}

```

```
1042 \newcommand{\answerFormatFlexibleLine}[1]{\protect\rule{\widthof{##1$}*2}{0.4pt}}

```

```
1043 \newcommand{\answerFormatFlexibleBox}[1]{\fbox{\scalebox{2}{\phantom{##1$}}}}

```

```
1044

```

```
1045 % options for default (i.e with answers filled in)

```

```
1046 \newcommand{\answerFormatPlain}[1]{\ensuremath{##1}}

```

```
1047 \newcommand{\answerFormatBlue}[1]{\color{blue}\ensuremath{##1}}

```

```
1048 \newcommand{\answerFormatBoxed}[1]{\fbox{\ensuremath{##1}}}

```

```
1049 \newcommand{\answerFormatBoxedGiven}[1]{\underset{\scriptstyle\mathrm{given}}{\fbox{\ensuremath{##1}}}}

```

```
1050

```

```
1051 % defaults for handout and default mode, and for \answer[given]

```

```
1052 \let\handoutAnswerFormat\answerFormatDots

```

```
1053 \let\defaultAnswerFormat\answerFormatBlue

```

```
1054 \let\givenAnswerFormat\answerFormatBoxedGiven

```

```
1055

```

```
1056 \newcommand{\answer}[2][]{%

```

```
1057 \ifmmode%

```

```
1058 \setkeys{answer}{##1}%

```

```
1059 \recordvariable{\ans@id}

```

```
1060 \ifthenelse{\boolean{\ans@given}}{

```

```
1061 {% Start then statement

```

```
1062 \ifhandout

```

```
1063 #2

```

```
1064 \else

```

```
1065 \givenAnswerFormat{##2} %% in case the argument helps formatting

```

```
1066 \fi

```

```
1067 }% End then statement

```

```
1068 {% Start else statement

```

```
1069 \ifhandout

```

```
1070 \handoutAnswerFormat{##2} %% in case the argument helps formatting

```

```
1071 \else% show answer in box outside handout mode

```

```
1072 \defaultAnswerFormat{##2} %% in case the argument helps formatting

```

```
1073 \fi

```

```
1074 }% End else statement

```

```
1075 \else%

```

```
1076 \GenericError{\space\space\space\space}% Throw an error based on... something? -- Jason

```

```
1077 {Attempt to use \@backslashchar answer outside of math mode}

```

```
1078 {See https://github.com/ximeraProject/ximeraLatex for explanation.}

```

```
1079 {Need to use either inline or display math.}%

```

```
1080 \fi

```

```
1081 }

```

```
1082 </classXimera>

```

On the HTML side, `\answer` emits spans—but it is usually just handled directly by MathJax.

```
1083 <#htXimera>

```

```
1084 \renewcommand{\answer}[2][false]{\HCode{<span class="answer_respondable">}#2\HCode{</span>}}

```

```
1085

```

```
1086 \def\validator[#1]{\stepcounter{identification}\HCode{<div class="validator" id="validator\ans@id">}}

```

```
1087 \def\endvalidator{\HCode{</div>}}

```



```
1088
1089 </htXimera>
```

## 2.10.2 Multiple choice and the like

```
multipleChoice Multiple choice
1090 <classXimera>
1091 % Jim: Originally this was \renewcommand{\theenumi}{$(\mathrm{\alph{enumi}})$}
1092 % but that breaks tex4ht because mathmode can only be processed by mathjax.
1093 % so now I made this just italicized.
```

## 2.10.3 Options

```
1094 \definekey{choice}{value}[]{\def\choice@value{#1}}

This flags the answer as the correct answer
1095 \defineboolkey{choice}{correct}[true]{\def\choice@correct{#1}}

Use an ID to refer to the choice.
1096 \definekey{multipleChoice}{id}{\def\mc@id{#1}}

\otherchoice outputs the item if correct and nothing if incorrect.
1097 \definekey{otherchoice}{value}[]{\def\otherchoice@value{#1}}
1098 \defineboolkey{otherchoice}{correct}[true]{\def\otherchoice@correct{#1}}

Default key choices for multiple choice options. Default for choice pairs. Default: answers
without the option "correct=true" is "incorrect".
1099 \setkeys{choice}{correct=false,value=}

Defaults for multipleChoice pairs. Default to no id? – Jason
1100 \setkeys{multipleChoice}{id=}

Defaults for otherchoice pairs. Default "otherchoice" to behave like "choice" for error
checking.
1101 \setkeys{otherchoice}{correct=false,value=}
1102 </classXimera>
```

## 2.10.4 Choices

```
\choice Like \item but for choice environments. choice command denotes a possible answer
choice for the multiple choice question.
1103 <classXimera>
1104 \newcommand{\choice}[2][]{%
1105 \setkeys{choice}{#1}%
1106 \item{#2}
1107 \ifthenelse{\boolean{\choice@correct}}
1108     {% Begin then result
1109     \ifhandout% if it's a handout do nothing.
1110     \else% otherwise place a checkmark when you select the "correct choice"... maybe? -- Jason
1111         \,\checkmark\,\setkeys{choice}{correct=false}
1112     \fi
1113     }% End then result
1114     {}% Begin/End else result.
1115 }
1116
1117 %Define an expandable version of choice Not really meant to be used outside this package (use
1118 % Is there a reason we can't just always use this as default? -- Jason
1119 \newcommand{\choiceEXP}[2][]{%
1120 \expandafter\setkeys\expandafter{choice}{#1}%
1121 \item{#2}
1122 \ifthenelse{\boolean{\choice@correct}}
1123 {% Begin then result
1124 \ifhandout
1125 \else
1126 \,\checkmark\,\setkeys{choice}{correct=false}
1127 \fi
1128 }% End then result
1129 {}% Begin/End else result.
```

```

1130 } %% note all the {} are needed in case the choice has [] in it.
1131
1132 % \otherchoice is the \choice used in wordChoice command.
1133 \newcommand{\otherchoice}[2][]{%
1134 \ignorespaces%
1135 \setkeys{otherchoice}{#1}%
1136 \ifthenelse{\boolean{\otherchoice@correct}}{%
1137 {% Start then result
1138 #2\ignorespaces\setkeys{otherchoice}{correct=false}\ignorespaces%
1139 }% End then result
1140 }% Start/End else result
1141 \ignorespaces%
1142 }%
1143 \newcommand{\inlinechoice}[2][]{%
1144 \setkeys{choice}{#1}%
1145 \iffirstinlinechoice
1146 (\hspace{-.25em}
1147 \firstinlinechoicefalse
1148 \else
1149 /
1150 \fi
1151 #2
1152 \ifthenelse{\boolean{\choice@correct}}{%
1153 {% Start then result
1154 \ifhandout\else\checkmark\ignorespaces\setkeys{choice}{correct=false}\ignorespaces\fi%
1155 }% End then result
1156 }% Start/End else result
1157 \hspace{-.25em}\ignorespaces%
1158 }
1159
1160 </classXimera>
On the HTML side, \choice emits <span>s.
1161 <htXimera>
1162 \newcounter{choiceId}
1163 \renewcommand{\choice}[2][]{%
1164 \setkeys{choice}{correct=false}%
1165 \setkeys{choice}{#1}%
1166 \stepcounter{choiceId}\IgnorePar%
1167 \HCode{<span class="choice }%
1168 \ifthenelse{\boolean{\choice@correct}}{\HCode{correct}}{}%
1169 \HCode{" }
1170 \ifthenelse{\equal{\choice@value}{}}{\HCode{data-value="\choice@value" }}%
1171 \HCode{id="choice\arabic{choiceId}">}%
1172 #2\HCode{</span>}}
1173 \let\inlinechoice\choice
1174 </htXimera>

```

### 2.10.5 Environment(s)

**multipleChoice** The environment `multipleChoice@` is for internal use only. Wrap `\choices` in a `multipleChoice` environment to make a multiple choice question.

```

1175 <classXimera>
1176 \newenvironment{multipleChoice}[1]{}
1177 {% Environment Start Code
1178 \setkeys{multipleChoice}{#1}%
1179 \recordvariable{\mc@id}%
1180 \begin{trivlist}
1181 \item[\hskip \labelsep\small\bfseries Multiple Choice:] \hfil
1182 \begin{enumerate}
1183 }% Note this means that \item has to be the first line after \begin{multipleChoice}.
1184 {% Environment End Code
1185 \end{enumerate}
1186 \end{trivlist}

```

```

1187 }
1188
1189 %multipleChoice@ is for internal use only! (used in wordChoice)
1190 %this is simply a wrapper for the sole showing (other)choice.
1191 \newenvironment{multipleChoice}[1][{}]{%
1192 </classXimera>

```

On the web, you might also expect these to be "problem environments" but they aren't – they're responsables. You might expect a `\setcounter{choiceId}{0}` here — that would be wrong, because then the generated IDs would no longer be unique.

```

1193 (*htXimera)
1194 \renewenvironment{multipleChoice}[1][%
1195 {\setkeys{multipleChoice}{#1}%
1196 \stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div class="multiple-choice" }
1197 \ifthenelse{\equal{\mc@id}{}}{\}\{\HCode{data-id="\mc@id" }}}%
1198 \HCode{id="problem\arabic{identification}">}%
1199 }\{\HCode{</div>}\IgnoreIndent}
1200 \ConfigureEnv{multipleChoice}{\}\{\}\{\}
1201 </htXimera>

```

## 2.11 Word choice

`\wordChoice` An in-line version of `multipleChoice`: uses `enumitem` package note, it is coded as a single line to avoid unwanted spaces in "given" mode.

```

1202 (*classXimera)
1203 \newcommand{\wordChoice}[1]{%
1204 \let\choicetemp\choice% Assign a "choicetemp" command to duplicate choice.
1205 \ifwordchoicegiven% If wordchoice option is on, we need to juggle around some definitions.
1206 \let\choice\otherchoice%
1207 %\begin{multipleChoice@}% -unnecessary (REMOVE THIS LINE IF THE YEAR IS 2019 or Beyond)
1208 #1
1209 %\end{multipleChoice@}% -unnecessary (REMOVE THIS LINE IF THE YEAR IS 2019 or Beyond)
1210 \else% If it isn't the regular "choice" command should work.
1211 \let\choice\inlinechoice%
1212 \begin{multipleChoice@}%
1213 #1%
1214 \end{multipleChoice@}%
1215 \fi%
1216 \let\choice\choicetemp% Now that choicetmp has been manipulated to what we want, replace choi
1217 }%
1218
1219
1220 </classXimera>

```

This is actually just word choice

```

1221 (*htXimera)
1222 \renewenvironment{multipleChoice@}{\refstepcounter{problem}}{\}%
1223 \ConfigureEnv{multipleChoice@}{\stepcounter{identification}\IgnorePar\HCode{<span class="word
1224 </htXimera>

```

## 2.12 Select all

`selectAll` A multiple-multiple choice question

```

1225 (*classXimera)
1226 \newenvironment{selectAll}[1][%
1227 {\begin{trivlist}\item[\hskip \labelsep \small\bfseries Select All Correct Answers:]\hfil\begin{
1228 {\end{enumerate}\end{trivlist}}
1229 </classXimera>

```

In the future we need this to (optionally) be displayed in the problem, while the actual code lives in the solution. Here is how this could be implemented: Like the `title/maketitle` commands, the multiple-choice could be stored in `\themultiplechoice`, flip a boolean, and execute `\makemultiplechoice` at the `\end` of the problem. We should also make a command called `\showchoices` that will show choices in the handout.

On the web, `selectAll` is handled just like `multipleChoice`.

```

1230 <*htXimera>
1231 \renewenvironment{selectAll}{\refstepcounter{problem}}{}%
1232 \ConfigureEnv{selectAll}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div
1233 </htXimera>

```

### 2.12.1 Free response

`freeResponse` A freeform input box.

```

1234 <*classXimera>
1235 \newboolean{given} %% required for freeResponse
1236 \setboolean{given}{true} %% could be replaced by a key=value pair later if needed
1237
1238 \ifhandout
1239 \newenvironment{freeResponse}[1][false]%
1240 {%
1241 \def\givenatend{\boolean{#1}}
1242 \ifthenelse{\boolean{#1}}
1243 {% Begin then result
1244 \begin{trivlist}
1245 \item
1246 }% End then result
1247 {% Begin else result
1248 \setbox0\vbox\bgroup
1249 }% End else result
1250 % {}% Don't think this is doing anything? -- Jason
1251 }
1252 {%
1253 \ifthenelse{\givenatend}
1254 {% Begin then result
1255 \end{trivlist}
1256 }% End then result
1257 {% Begin else result
1258 \egroup
1259 }% End else result
1260 % {}% Don't think this is doing anything? -- Jason
1261 }
1262 \else
1263 \newenvironment{freeResponse}[1][false]%
1264 {% Environment Beginning Code
1265 \ifthenelse{\boolean{#1}}%% Could probably change this with just putting the (given) in the
1266 {% Begin then result
1267 \begin{trivlist}
1268 \item[\hspace{1cm}\labelsep\bfseries Free Response (Given):\hspace{2ex}]
1269 }% End then result
1270 {% Begin else result
1271 \begin{trivlist}
1272 \item[\hspace{1cm}\labelsep\bfseries Free Response:\hspace{2ex}]
1273 }% End else result
1274 }
1275 {% Environment Ending Code
1276 \end{trivlist}
1277 }
1278 \fi
1279
1280 </classXimera>
1281 <*htXimera>
1282
1283 \renewenvironment{freeResponse}{\refstepcounter{problem}}{}%
1284 \ConfigureEnv{freeResponse}{\stepcounter{identification}\ifvmode \IgnorePar\fi \EndP\HCode{<div
1285
1286 </htXimera>

```

## 2.12.2 Feedback

**feedback** An initially hidden environment that uncovers itself at an appropriate time. New Validator rewrite code added by Jason Nowell. Original code provided by Jim Fowler. Validator is an environment designed to run a custom check on answers (usually) using javascript code.

Define a placeholder command for validator and feedback.

```
1287 \newcommand{\PH@Command}{}
1288 \newcommand{\PH@Command}{}{}
```

Validator should take an argument and detokenize it and display it at the start of the environment. The original Validator environment had everything framed in an mbox; presumably to make the text look a bit nicer, although this seems redundant with `texttt`. It shouldn't cause any harm so I have left it in for now.

```
1289 \newenvironment{validator}[1][]{
1290 \def\PH@Command{#1}% Use PH@Command to hold the content and be a target for "\expandafter" to
1291 \mbox{\texttt{\detokenize\expandafter{\PH@Command}}}% Now expand PH@Command once and then det
1292 }{}
```

First, if it's a handout, we want feedback to eat everything and then disappear entirely. So we do this:

```
1293 \ifhandout%
1294 \newenvironment{feedback}
1295     {%
1296     \setbox0\vbox\bgroup
1297     }
1298     {%
1299     \egroup
1300     }
```

If this isn't a handout, then we want to display the Feedback by using a label, positioned and formatted as a `\item` in a trivlist. It is important that we also detokenize the content of the optional argument, as it is likely to contain javascript or other code that latex won't be able to make sense of.

```
1301 \else
1302 \newenvironment{feedback}[1][attempt]{
1303
1304 \def\PH@Command{#1}% Use PH@Command to hold the content and be a target for "\expandafter" to
1305
1306 \begin{trivlist}% Begin the trivlist to use formatting of the "Feedback" label.
1307 \item[\hspace{1em}\labelsep\small\slshape\bfseries Feedback% Format the "Feedback" label. Don't f
1308 (\texttt{\detokenize\expandafter{\PH@Command}}):% Format (and detokenize) the condition for f
1309 \hspace{2em}]\small\slshape% Insert some space before the actual feedback given.
1310 ]{
1311 \end{trivlist}
1312 }
1313
1314 \fi
1315 \end{classXimera}
```

Feedback environments take an optional parameter (which describes when the feedback is to be provided)

```
1316 \newcommand{\feedback}[1][attempt]{
1317 \def\feedbackcode{\ifnextchar[{\@feedbackcode}{\@feedbackattempt}}
1318 \def\@feedbackattempt{\@feedbackcode[attempt]}
1319 \def\@feedbackcode[#1]{\stepcounter{identification}%
1320 \ifvmode \IgnorePar\fi \EndP%
1321 \ifthenelse{\equal{#1}{attempt}}{\HCode{<div class="feedback" data-feedback="attempt" id="fe
1322 {\ifthenelse{\equal{#1}{correct}}{\HCode{<div class="feedback" data-feedback="correct" id="f
1323 {\HCode{<div class="feedback" data-feedback="script" id="feedback\arabic{identification}><s
1324 \def\endfeedback{\HCode{</div>}\IgnoreIndent}
1325 \end{classXimera}
```

### 2.12.3 Ungraded activities

`ungraded` The `ungraded` environment is used to record that certain parts of activities should not be worth points. For example, if you want to use a `multipleChoice` as a survey question, you can place it inside an `ungraded` environment. On the  $\text{\LaTeX}$  side, the `ungraded` environment does nothing.

```
1326 \begin{Ximera}
1327 \newenvironment{ungraded}{}{}
1328 \end{Ximera}
```

But on the html side, `ungraded` wraps the activities in a `div` in order to assign some weight to them for grading.

```
1329 \begin{htmlXimera}
1330 \renewenvironment{ungraded}{%
1331 \ifvmode \IgnorePar\fi \EndP\HCode{<div class="ungraded">}\IgnoreIndent%
1332 }{
1333 \ifvmode \IgnorePar\fi \EndP\HCode{</div>}\IgnoreIndent%
1334 }
1335 \end{htmlXimera}
```

## 2.13 Support for the web

### 2.13.1 MathJax support

When using mathjax, dump all the `\newcommands` to a `.jax` file.

First, create the `.jax` file.

```
1336 \begin{Ximera}
1337 \ifdefined\HCode
1338 \else
1339 \newwrite\myfile
1340 \immediate\openout\myfile=\jobname.jax
1341 \fi
1342 \end{Ximera}
```

From `only.dtx` we must also create prompt on the MathJax side.

```
1343 \begin{Ximera}
1344 \ifdefined\HCode
1345 \else
1346 \immediate\write\myfile{\unexpanded{\newenvironment}{prompt}}{}{}
1347 \fi
1348 \end{Ximera}
```

Redefine newcommand appropriately.

```
1349 \begin{Ximera}
1350 \ifdefined\HCode
1351 \else
1352 \let\@oldargdef\@argdef
1353 \long\def\@argdef#1[#2]#3{%
1354 \immediate\write\myfile{\unexpanded{\newcommand}{\unexpanded{#1}}[\unexpanded{#2}]{\unexpanded{#3}}}%
1355 \@oldargdef#1[#2]#3}%
1356 }
1357
1358 \let\@OldDeclareMathOperator\DeclareMathOperator
1359 \renewcommand{\DeclareMathOperator}[2]{\@OldDeclareMathOperator{#1}{#2}\immediate\write\myfile{\unexpanded{\newcommand}{\unexpanded{#1}}[\unexpanded{#2}]{\unexpanded{#3}}}%
1360
1361 \fi
1362 \end{Ximera}
```

Include the jax'ed newcommands

```
1363 \begin{cfgXimera}
1364 % Remove commands that use @
1365 \immediate\write18{sed -i "/@/d" \jobname.jax}
1366 % Replace ##1 with #1 and so forth
1367 \immediate\write18{sed -i "s/\string#\string#\string\\([0-9]\string\\)/\string#\string\\1/g" \jobname.jax}
1368 \end{cfgXimera}
```

```

1369 \Configure{BVerbatimInput}{-}{-}{-}
1370
1371 \Configure{verbatiminput}{-}{-}{-}
1372
1373 % Instead of a nonbreaking space, use a standard space
1374 \makeatletter
1375 \def\FV@Space{\space}
1376 \makeatother
1377
1378 % Include the mathjax newcommands in a math/tex script right at the beginning of the body
1379 \Configure{BODY}{-%
1380 \HCode{<body>\Hnewline}%
1381 \Tg<div class="preamble">%
1382 \Tg<script type="math/tex">%
1383 \BVerbatimInput{\jobname.jax}%
1384 \Tg</script>%
1385 \IfFileExists{\jobname.ids}{\HCode{<script type="text/javascript">\Hnewline}%
1386 \BVerbatimInput{\jobname.ids}%
1387 \HCode{</script>\Hnewline}%
1388 \Tg</div>%
1389 }{-}
1390 }{-}
1391 \HCode{</body>\Hnewline}%
1392 }

```

Now I just need to add a newcommand command which outputs the appropriate new-commands to MathJax; then this should be "good enough" for our purposes.

```

1393 \newtoks\eqtoks
1394 \def\AltMath#1$\{ \eqtoks{#1}%
1395     \HCode{<script type="math/tex">\the\eqtoks</script>}}$}
1396 \Configure{$}{-}{-}{\expandafter\AltMath}
1397
1398 \def\Alt1MathI#1\){ \eqtoks{#1}%
1399     \HCode{<script type="math/tex">\the\eqtoks</script>}\)}
1400 \Configure{()}{-}{-}{\Alt1MathI}{-}
1401
1402 \def\Alt1Display#1\{ \eqtoks{#1}%
1403     \HCode{<script type="math/tex; mode=display">\the\eqtoks</script>}\]}
1404 \Configure{[]}{-}{-}{\Alt1Display}{-}
1405
1406 \def\Alt1DisplayI#1$$\{ \eqtoks{#1}%
1407     \HCode{<script type="math/tex; mode=display">\the\eqtoks</script>}}$$}
1408 \Configure{$$}{-}{-}{\expandafter\Alt1DisplayI}

```

Need to turn off htmlpar too, as explained in <http://tex.stackexchange.com/questions/204930/vertical-spaces-in-htlatex-scriptenv>

```

1409 \newcommand\VerbMath[1]{%
1410 \renewenvironment{#1}{\NoFonts}{\EndNoFonts}
1411 \ScriptEnv{#1}{\ifvmode \IgnorePar\fi \EndP\HCode{<script type="math/tex; mode=display"> \st
1412 }

```

This is a fix for the LAODE book, which uses matlabEquation as if it were an equation

```

1413 \ScriptEnv{matlabEquation}{\ifvmode \IgnorePar\fi \EndP\HCode{<script type="math/tex; mode=d
1414
1415 \VerbMath{equation}
1416 \VerbMath{equation*}
1417 \VerbMath{align}
1418 \VerbMath{align*}
1419 \VerbMath{alignat}
1420 \VerbMath{alignat*}
1421 \VerbMath{eqnarray}
1422 \VerbMath{eqnarray*}
1423
1424 </cfgXimera>

```

### 2.13.2 Semantic HTML

`\textbf` Using `\textbf` emits a `<strong>` tag.

```
1425 (*cfgXimera)
1426 \Configure{textbf}{\ifvmode\ShowPar\fi\HCode{<strong>}}{\HCode{</strong>}}
1427 \</cfgXimera>
```

`\textit` Using `\textit` or similar emits an `<em>` tag.

```
1428 (*cfgXimera)
1429 \Configure{textit}{\ifvmode\ShowPar\fi\HCode{<em>}}{\HCode{</em>}}
1430 \Configure{emph}{\ifvmode\ShowPar\fi\HCode{<em>}}{\HCode{</em>}}
1431 \</cfgXimera>
```

`\texttt` Using `\texttt` emits a `<code>` tag.

```
1432 (*cfgXimera)
1433 \Configure{texttt}{\ifvmode\ShowPar\fi\HCode{<code>}}{\HCode{</code>}}
1434 \</cfgXimera>
```

## 2.14 Tools

### 2.14.1 Suppress

**suppress** The suppress environment is a good way to suppress output without commenting it. This way we can avoid many of the places we use `environ` package and this should also avoid most of the verbatim conflicts. This is code adapted from `syntonly.sty`.

```
1435 (*classXimera)
1436 \font\dummyft@=dummy \relax
1437 \def\suppress{%
1438   \begingroup\par
1439   \parskip\z@
1440   \offinterlineskip
1441   \baselineskip=\z@skip
1442   \lineskip=\z@skip
1443   \lineskiplimit=\maxdimen
1444   \dummyft@
1445   \count@\sixt@@n
1446   \loop\ifnum\count@ >\z@
1447     \advance\count@\m@ne
1448     \textfont\count@\dummyft@
1449     \scriptfont\count@\dummyft@
1450     \scriptscriptfont\count@\dummyft@
1451   \repeat
1452   \let\selectfont\relax
1453   \let\mathversion@gobble
1454   \let\getanddefine@fonts@gobbletwo
1455   \tracinglostchars\z@
1456   \frenchspacing
1457   \hbadness\@M}
1458 \def\endsuppress{\par\endgroup}
1459 \</classXimera>
```

### 2.14.2 The End

It seems that some of the files need to conclude with something or another.

```
1460 (*htXimera)
1461 \Hinput{ximera}
1462 \</htXimera>
1463 (*htXourse)
1464 \Hinput{xourse}
1465 \</htXourse>
1466 (*cfgXimera)
1467 \begin{document}
1468 \EndPreamble
1469 \</cfgXimera>
```



### 3 xourse.cls

```

1470 (*classXourse)

notoc The default behavior of the class is to provide a table of contents listing all activities in
the course. This option will suppress this table of contents.

1471 \newif\ifnotoc
1472 \notocfalse
1473 \DeclareOption{notoc}{\notoctrue}

nonewpage The default behavior of the class is to start each activity on a new page. This option
will start activities without making a new page.

1474 \newif\ifnonewpage
1475 \nonewpagefalse
1476 \DeclareOption{nonewpage}{\nonewpagetrue}

1477 \DeclareOption*{\PassOptionsToClass{\CurrentOption}{ximera}}
1478 \ProcessOptions\relax
1479 \LoadClass{ximera}
1480 % \begin{macrocode}
1481 \end{classXourse}

```

#### 3.1 Activities

The core of the `xourse` system. It works by redefining the `document` environment, thus making the `\begin` and `\end{document}` of the subfile ‘transparent’ to the inclusion. The redefinition of `\documentclass` is analogous, just having a required and an optional arguments which mean nothing to `\subfile`.

```

1482 (*classXourse)
1483 \newcommand{\skip@preamble}{%
1484   \let\document\relax\let\enddocument\relax%
1485   \newenvironment{document}{\let\input\otherinput}{}%
1486   \renewcommand{\documentclass}[2][subfiles]{}}

```

Note that the new command `\subfile` calls for `\skip@preamble` *within a group*. The changes to `document` and `\documentclass` are undone after the inclusion of the subfile.

Numbering starts a page too soon without this:

```

1487 \let\otherinput\input
Store usual \maketitle as \othermaketitle
1488 \let\othermaketitle\maketitle

\maketitle In a xourse file, \maketitle is redefined to give course packet title page and toc.

1489 \renewcommand{\maketitle}{ %
1490 \pagestyle{empty}
1491 \begin{center}
1492 ~\ %puts space at top of page to move title down.
1493 \vskip .25\textheight
1494 \hrulefill\
1495 \vskip 1em
1496 \bfseries{\Huge \@title} \
1497 \hrulefill\
1498 \vskip 3em
1499 {\Large \@author}
1500 \vskip 2em
1501 {\large \@date}
1502 \end{center}
1503 \clearpage

```

When `notoc` option is used, we do not include a table of contents. Otherwise we include a table of contents in every course packet.

```

1504 \ifnotoc
1505 \else
1506   \tableofcontents\clearpage

```

```

1507 \clearpage
1508 \fi
Switch to main pagestyle, just like a document with documentclass ximera.
1509 \pagestyle{main}
Renew maketitle to usual definition.
1510 \let\maketitle\othermaketitle
And we finish with our redefinition of \maketitle.
1511 }
1512 \relax
1513 \end{classXourse}

```

### 3.1.1 Regular activities

`\activity` Documents included with `\activity` will be included in the body of the xourse document. Any `\input` commands within included ximera documents will be ignored. Any `\usepackage` commands within included ximera documents will cause an error. Overlapping `\newcommand` definitions within multiple ximera documents included simultaneously will cause an error. The `\activity` command inputs the file name provided without `\documentclass`, without `\begin{document}`/`\end{document}` and without any inputs in the preamble of the included file.

```

1514 \begin{classXourse}
1515 \ifnonewpage
1516 \newcommand{\activity}[2][]{\%
1517 \setkeys{activity}{#1}
1518 \renewcommand{\input}[1]{\%
1519 \begin{group}\skip@preamble\otherinput{#2}\end{group}\par\vspace{\topsep}
1520 \let\input\otherinput}
1521 \else
1522 \newcommand{\activity}[2][]{\%
1523 \setkeys{activity}{#1}
1524 \renewcommand{\input}[1]{\%
1525 \begin{group}\skip@preamble\otherinput{#2}\end{group}\clearpage
1526 \let\input\otherinput}
1527 \fi
1528 \relax
1529 \end{classXourse}

1530 \begin{htXourse}
1531 \renewcommand{\activity}[2][]{\%
1532 \ifvmode \IgnorePar\fi \EndP\HCode{<a class="activity card \activitystyle" href="#2" data-opt
1533 }
1534 \end{htXourse}

```

When running xake, we can just ignore activities

```

1535 \begin{classXourse}
1536 \ifxake
1537 \renewcommand{\activity}[2][]{\%
1538 \fi
1539 \end{classXourse}

```

### 3.1.2 Practice activities

`\practice` Like `\activity` but not expecting a title.

```

1540 \begin{classXourse}
1541 \ifhandout
1542 \newcommand{\practice}[2][]{\%
1543 \setkeys{practice}{#1}%!!!!
1544 \renewcommand{\input}[1]{\%
1545 \begin{group}\skip@preamble\otherinput{#2}\end{group}
1546 \let\input\otherinput}
1547 \else

```

```

1548 \newcommand{\practice}[2][\texttt{\detokenize{#2}}}% gives file name for practice
1549 \setkeys{practice}{#1}%!!!!
1550 \renewcommand{\input}[1]{
1551 \begingroup\skip@preamble\otherinput{#2}\endgroup
1552 \let\input\otherinput}
1553 \fi
1554 \relax
1555 \end{classXourse}

```

The practice environment does nothing, but will eventually produce exercises at the end of an activity

```

1556 \end{classXourse}
1557 \ifxake
1558 \renewcommand{\practice}[2][{}]{
1559 \fi
1560 \end{classXourse}

```

I suppose it is reasonable for practice cards to NOT have an activitystyle, since the activitystyle is basically PRACTICE.

```

1561 \end{htXourse}
1562 \renewcommand{\practice}[2][{}]{%
1563 \ifvmode\IgnorePar\fi\EndP%
1564 \HCode{<a class="activity card practice" href="#2" data-options="#1">#2</a>}%
1565 \IgnoreIndent%
1566 }
1567 \end{htXourse}

```

## 3.2 Sectioning

Makes the table of contents look a bit better. This can be redefined in the preamble if you do not like the appearance. The name of a section inside an activity.

```

\section
1568 \end{classXourse}
1569 \renewcommand*\l@section{\@dottedtocline{1}{1.5em}{4.2em}}
1570 \end{classXourse}

```

\subsection The name of a subsection inside an activity.

```

1571 \end{classXourse}
1572 \renewcommand*\l@subsection{\@dottedtocline{2}{3.8em}{4.2em}}
1573 \end{classXourse}

```

\part Xourse files can have parts. The name of a large part of a xourse.

```

1574 \end{htXourse}
1575 \newcounter{ximera@part}
1576 \setcounter{ximera@part}{0}
1577 \renewcommand\part[1]{%
1578 \stepcounter{ximera@part}%
1579 \ifvmode \IgnorePar\fi \EndP%
1580 \% \HCode{<h1 id="part\arabic{ximera@part}" class="card part">#1\HCode{</h1>}}% makes cards dis
1581 \HCode{<h1 id="part\arabic{ximera@part}" class="card part">#1</h1>}}%
1582 \IgnoreIndent%
1583 }
1584 \end{htXourse}

```

\paragraph Paragraph commands emit spans. A small heading.

```

1585 \end{cfgXimera}
1586 \renewcommand{\paragraph}[1]{%
1587 \HCode{<span class="paragraphHead">%
1588 #1%
1589 \HCode{</span>}}\par\IgnorePar}
1590 \end{cfgXimera}

```

\subparagraph An even smaller heading.

```

1591 \end{cfgXimera}
1592 \renewcommand{\subparagraph}[1]{%
1593 \HCode{<span class="subparagraphHead">%

```

```

1594 #1%
1595 \HCode{</span>}\par\IgnorePar}
1596 </cfgXimera>

```

### 3.3 Grading by points

**graded** The `graded` environment does nothing in latex, but in html, it wraps the activities in a div in order to assign some weight to them for grading.

```

1597 <*classXourse>
1598 \newenvironment{graded}[1]{%{}
1599 </classXourse>

```

So indeed this environment in html wraps the activities in a div in order to assign some number of points to them.

```

1600 <*htXourse>
1601 \renewenvironment{graded}[1]{%
1602 \ifvmode \IgnorePar\fi \EndP\HCode{<div class="graded" data-weight="#1">}\IgnoreIndent%
1603 }{
1604 \ifvmode \IgnorePar\fi \EndP\HCode{</div>}\IgnoreIndent%
1605 }
1606 </htXourse>

```

### 3.4 Logos

**\logo** A logo for the xourse.

```

1607 <*classXourse>
1608 \newcommand*{\logo}[1]{%
1609 \ifx\@onlypreamble\@notprerr
1610 \ClassError{xourse}{logo can only be used in the preamble}
1611 {Move your logo command to the preamble}
1612 \else %
1613 \IfFileExists{#1}%
1614 {\gdef\xourse@logo{#1}}%
1615 {\ClassError{xourse}{logo file does not exist}
1616 {To use logo, make sure that the referenced image file exists}}%
1617 \fi%
1618 }
1619
1620 </classXourse>

```

The xourse logo is an `og:image` in the `opengraph` taxonomy.

```

1621 <*htXourse>
1622 \Configure{@HEAD}{%
1623 \HCode{<meta name="og:image" content="}%
1624 \ifdefined\xourse@logo%
1625 \xourse@logo%
1626 \fi%
1627 \HCode{" />\Hnewline}}%
1628 </htXourse>

```