

## CODING STYLE

02BY

### Contents

1. List of style comments	1
2. Other chapters	3
References	5

### 1. List of style comments

02BZ These will be changed over time, but having some here now will hopefully encourage a consistent LaTeX style. We will call “code<sup>1</sup>” the contents of the source files.

- (1) Keep all lines in all tex files to at most 80 characters.
- (2) Do not use indentation in the tex file. Use syntax highlighting in your editor, instead of indentation, to visualize environments, etc.
- (3) Use

`\medskip\noindent`

to start a new paragraph, and use

`\noindent`

to start a new paragraph just after an environment.

- (4) Do not break the code for mathematical formulas across lines if possible. If the complete code complete with enclosing dollar signs does not fit on the line, then start with the first dollar sign on the first character of the next line. If it still does not fit, find a mathematically reasonable spot to break the code.
- (5) Displayed math equations should be coded as follows

`$$`

`...`

`...`

`$$`

In other words, start with a double dollar sign on a line by itself and end similarly.

- (6) *Do not use any macros.* Rationale: This makes it easier to read the tex file, and start editing an arbitrary part without having to learn innumerable macros. And it doesn’t make it harder or more timeconsuming to write. Of course the disadvantage is that the same mathematical object may be TeXed differently in different places in the text, but this should be easy to spot.

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This is a chapter of the Stacks Project, version b78fe50a, compiled on Oct 17, 2019.

<sup>1</sup>It is all Knuth’s fault. See [Knu79].

- (7) The theorem environments we use are: “theorem”, “proposition”, “lemma” (plain), “definition”, “example”, “exercise”, “situation” (definition), “remark”, “remarks” (remark). Of course there is also a “proof” environment.

- (8) An environment “foo” should be coded as follows

```
\begin{foo}
...
...
\end{foo}
```

similarly to the way displayed equations are coded.

- (9) Instead of a “corollary”, just use “lemma” environment since likely the result will be used to prove the next bigger theorem anyway.
- (10) Directly following each lemma, proposition, or theorem is the proof of said lemma, proposition, or theorem. No nested proofs please.
- (11) The files `preamble.tex`, `chapters.tex` and `fdl.tex` are special `tex` files. Apart from these, each `tex` file has the following structure

```
\input{preamble}
\begin{document}
\title{Title}
\maketitle
\tableofcontents
...
...
\input{chapters}
\bibliography{my}
\bibliographystyle{amsalpha}
\end{document}
```

- (12) Try to add labels to lemmas, propositions, theorems, and even remarks, exercise, and other environments. If labelling a lemma use something like

```
\begin{lemma}
\label{lemma-bar}
...
\end{lemma}
```

Similarly for all other environments. In other words, the label of a environment named “foo” starts with “foo-”. In addition to this please make all labels consist only of lower case letters, digits, and the symbol “-”.

- (13) Never refer to “the lemma above” (or proposition, etc). Instead use:

```
Lemma \ref{lemma-bar} above
```

This means that later moving lemmas around is basically harmless.

- (14) Cross-file referencing. To reference a lemma labeled “lemma-bar” in the file `foo.tex` which has title “Foo”, please use the following code

```
Foo, Lemma \ref{foo-lemma-bar}
```

If this does not work, then take a look at the file `preamble.tex` to find the correct expression to use. This will produce the “Foo, Lemma <link>” in the output file so it will be clear that the link points out of the file.

- (15) If at all possible avoid forward references in proof environments. (It should be possible to write an automated test for this.)
- (16) Do not start any sentence with a mathematical symbol.

- (17) Do not have a sentence of the type “This follows from the following” just before a lemma, proposition, or theorem. Every sentence ends with a period.
- (18) State all hypotheses in each lemma, proposition, theorem. This makes it easier for readers to see if a given lemma, proposition, or theorem applies to their particular problem.
- (19) Keep proofs short; less than 1 page in pdf or dvi. You can always achieve this by splitting out the proof in lemmas etc.
- (20) In a defining property foobar use
 

```
{\it foobar}
```

 in the code inside the definition environment. Similarly if the definition occurs in the text of the document. This will make it easier for the reader to see what it is that is being defined.
- (21) Put any definition that will be used outside the section it is in, in its own definition environment. Temporary definitions may be made in the text. A tricky case is that of mathematical constructions (which are often definitions involving interrelated lemmas). Maybe a good solution is to have them in their own short section so users can refer to the section instead of a definition.
- (22) Do not number equations unless they are actually being referenced somewhere in the text. We can always add labels later.
- (23) In statements of lemmas, propositions and theorems and in proofs keep the sentences short. For example, instead of “Let  $R$  be a ring and let  $M$  be an  $R$ -module.” write “Let  $R$  be a ring. Let  $M$  be an  $R$ -module.”. Rationale: This makes it easier to parse the trickier parts of proofs and statements.
- (24) Use the
 

```
\section
```

 command to make sections, but try to avoid using subsections and subsections.
- (25) Avoid using complicated latex constructions.

## 2. Other chapters

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>Preliminaries</li> <li>(1) Introduction</li> <li>(2) Conventions</li> <li>(3) Set Theory</li> <li>(4) Categories</li> <li>(5) Topology</li> <li>(6) Sheaves on Spaces</li> <li>(7) Sites and Sheaves</li> <li>(8) Stacks</li> <li>(9) Fields</li> <li>(10) Commutative Algebra</li> <li>(11) Brauer Groups</li> <li>(12) Homological Algebra</li> <li>(13) Derived Categories</li> <li>(14) Simplicial Methods</li> </ul> | <ul style="list-style-type: none"> <li>(15) More on Algebra</li> <li>(16) Smoothing Ring Maps</li> <li>(17) Sheaves of Modules</li> <li>(18) Modules on Sites</li> <li>(19) Injectives</li> <li>(20) Cohomology of Sheaves</li> <li>(21) Cohomology on Sites</li> <li>(22) Differential Graded Algebra</li> <li>(23) Divided Power Algebra</li> <li>(24) Hypercoverings</li> <li>Schemes</li> <li>(25) Schemes</li> <li>(26) Constructions of Schemes</li> <li>(27) Properties of Schemes</li> <li>(28) Morphisms of Schemes</li> </ul> |
|--|---|

- (29) Cohomology of Schemes
  - (30) Divisors
  - (31) Limits of Schemes
  - (32) Varieties
  - (33) Topologies on Schemes
  - (34) Descent
  - (35) Derived Categories of Schemes
  - (36) More on Morphisms
  - (37) More on Flatness
  - (38) Groupoid Schemes
  - (39) More on Groupoid Schemes
  - (40) Étale Morphisms of Schemes
- Topics in Scheme Theory
- (41) Chow Homology
  - (42) Intersection Theory
  - (43) Picard Schemes of Curves
  - (44) Weil Cohomology Theories
  - (45) Adequate Modules
  - (46) Dualizing Complexes
  - (47) Duality for Schemes
  - (48) Discriminants and Differents
  - (49) de Rham Cohomology
  - (50) Local Cohomology
  - (51) Algebraic and Formal Geometry
  - (52) Algebraic Curves
  - (53) Resolution of Surfaces
  - (54) Semistable Reduction
  - (55) Fundamental Groups of Schemes
  - (56) Étale Cohomology
  - (57) Crystalline Cohomology
  - (58) Pro-étale Cohomology
  - (59) More Étale Cohomology
  - (60) The Trace Formula
- Algebraic Spaces
- (61) Algebraic Spaces
  - (62) Properties of Algebraic Spaces
  - (63) Morphisms of Algebraic Spaces
  - (64) Decent Algebraic Spaces
  - (65) Cohomology of Algebraic Spaces
  - (66) Limits of Algebraic Spaces
  - (67) Divisors on Algebraic Spaces
  - (68) Algebraic Spaces over Fields
  - (69) Topologies on Algebraic Spaces
  - (70) Descent and Algebraic Spaces
  - (71) Derived Categories of Spaces
  - (72) More on Morphisms of Spaces
  - (73) Flatness on Algebraic Spaces
- (74) Groupoids in Algebraic Spaces
  - (75) More on Groupoids in Spaces
  - (76) Bootstrap
  - (77) Pushouts of Algebraic Spaces
- Topics in Geometry
- (78) Chow Groups of Spaces
  - (79) Quotients of Groupoids
  - (80) More on Cohomology of Spaces
  - (81) Simplicial Spaces
  - (82) Duality for Spaces
  - (83) Formal Algebraic Spaces
  - (84) Restricted Power Series
  - (85) Resolution of Surfaces Revisited
- Deformation Theory
- (86) Formal Deformation Theory
  - (87) Deformation Theory
  - (88) The Cotangent Complex
  - (89) Deformation Problems
- Algebraic Stacks
- (90) Algebraic Stacks
  - (91) Examples of Stacks
  - (92) Sheaves on Algebraic Stacks
  - (93) Criteria for Representability
  - (94) Artin's Axioms
  - (95) Quot and Hilbert Spaces
  - (96) Properties of Algebraic Stacks
  - (97) Morphisms of Algebraic Stacks
  - (98) Limits of Algebraic Stacks
  - (99) Cohomology of Algebraic Stacks
  - (100) Derived Categories of Stacks
  - (101) Introducing Algebraic Stacks
  - (102) More on Morphisms of Stacks
  - (103) The Geometry of Stacks
- Topics in Moduli Theory
- (104) Moduli Stacks
  - (105) Moduli of Curves
- Miscellany
- (106) Examples
  - (107) Exercises
  - (108) Guide to Literature
  - (109) Desirables
  - (110) Coding Style
  - (111) Obsolete
  - (112) GNU Free Documentation License
  - (113) Auto Generated Index

### References

- [Knu79] Donald Ervin Knuth, *Tau Epsilon Chi, a system for technical text*, American Mathematical Society, Providence, R.I., 1979, Revised version of Stanford Computer Science report number STAN-CS-78-675.