# Posting degree project presentations as Canvas calendar events and announcements and in the KTH Calendar

Gerald Q. Maguire Jr.

KTH Royal Institute of Technology would like to have Swedish and English languages as parallel languages within the university. As all KTH theses should have English **and** Swedish abstracts and ideally keywords and titles, it would be advantageous to include this information in the announcements of degree project presentations. Additionally, many students doing degree projects need to be an active listener for some number of other degree project presentations. Moreover, degree project presentations are supposed to be public. I have written some software to make it easier to announce these events[*] to make it easier for people to know about them and so that they can attend.

## 1   Put information into LaTeX template to generate a draft or final thesis

Figure 1 shows the title page of a thesis created using a LaTeX.template that I have developed. The idea is to capture the information needed for the announcement of the oral presentation and for reporting the final approved thesis in DiVA via the thesis itself.

Note that the following information is present in the order of this exposition, not necessarily the order it is in the LaTeX source file. However, all of this information is prior to `\begin{document}.`

Information about the title and the student authors of the thesis is entered via the set of macros as shown in Figure 2. Note that you can have either one or two authors (the latter in the case of a $1^{st}$ cycle degree project). There are several other elements of metadata collected about the student (primarily driven by the current author metadata fields in DiVA). A brief description of them and why they are there are given below:

- One might question why have an e-mail address (when under the current policy the student will lose their e-mail address upon graduation)? One of the main reasons is so that the library (i.e., KTHB) can notify the student that the thesis has be stored in DiVA. A second reason is if the library needs to contact the student.
- One might also wonder, why include the student's `kthid`. The main reason is that this identifier uniquely identifies this author within KTH, so that all of their publications can be found in a DiVA search.
- Note that ORCiD information is unnecessary, but if the student has an ORCiD identifier, it will be added to the record in DiVA. Student's may find it useful to have such an identifier if they are going to go on to write conference, journal, and other publications in the future.
- A very questionable field is `authorsSchool`. In a discussion with DiVA administrators at KTH on 2021-04-29, the consensus was that this should be the school of the thesis examiner, since $1^{st}$ and $2^{nd}$ cycle students are in *programs of study* and **not** schools, department, etc.
- Finally, there is `programcode` – this is used to generate the degree information just above the data on the title page and is also used to compute the "lead" for the calendar entry (which differs depending upon whether it is a $1^{st}$ or $2^{nd}$ cycle degree project presentation).

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[*] All of the names (except my own) are fictitious and not meant to be associated with any real persons. However, the names of KTH's schools and program are the actual names.

**NB**: A limitation of the current template is that I do not handle the case of two students who are in different programs.



**This is the title in the language of the thesis**

**An subtitle in the language of the thesis**

FAKE A. STUDENT

FAKE B. STUDENT

Bachelor's Programme in Information and Communication Technology
Date: May 6, 2021

Supervisors: A. Busy Supervisor, Another Busy Supervisor
Examiner: Gerald Q. Maguire Jr.
    School of Electrical Engineering and Computer Science
Host company: Företaget AB
Swedish title: Detta är den svenska översättningen av titeln
Swedish subtitle: Detta är den svenska översättningen av undertiteln

*Figure 1: Example of title page of a thesis*

```
%% Information for inside title page
\title{This is the title in the language of the thesis}
\subtitle{An subtitle in the language of the thesis}
% give the alternative title - i.e., if the thesis is in English, then give
a Swedish title
\alttitle{Detta är den svenska översättningen av titeln}
\altsubtitle{Detta är den svenska översättningen av undertiteln}

\authorsLastname{Student}
\authorsFirstname{Fake A.}
\email{a@kth.se}
\kthid{u100001}
% If the student has an ORCiD - add it here
\orcid{0000-0002-00001-1234}
\authorsSchool{\schoolAcronym{EECS}}

\programcode{TCOMK}
%% Alternatively, you can say \programme{Civilingenjör Datateknik} to
directly set the programme string

% If there is a second author - add them here:
\secondAuthorsLastname{Student}
\secondAuthorsFirstname{Fake B.}
\secondemail{b@kth.se}
\secondkthid{u100002}
% If the student has an ORCiD - add it here
\secondorcid{0000-0002-00001-5678}
\secondAuthorsSchool{\schoolAcronym{ABE}}
```

*Figure 2: Information about the title and the student authors of the thesis*

Figure 3 shows the information entered about the supervisor or supervisors and the examiner.

**NB**: A limitation of the current template is that I do not handle (a) more than three supervisors or (b) the case of multiple examiners.

```
\supervisorAsLastname{Supervisor}
\supervisorAsFirstname{A. Busy}
\supervisorAsEmail{sa@kth.se}
% If the supervisor is from within KTH add their KTHID, School and
Department info
\supervisorAsKTHID{u100003}
\supervisorAsSchool{\schoolAcronym{EECS}}
\supervisorAsDepartment{Computer Science}
% other for a supervisor outside of KTH add their organization info
%\supervisorAsOrganization{Timbuktu University, Department of
Pseudoscience}

%If there is a second supervisor add them here:
\supervisorBsLastname{Supervisor}
\supervisorBsFirstname{Another Busy}
\supervisorBsEmail{sb@kth.se}
% If the supervisor is from within KTH add their KTHID, School and
Department info
\supervisorBsKTHID{u100003}
\supervisorBsSchool{\schoolAcronym{ABE}}
\supervisorBsDepartment{Public Buildings}
% other for a supervisor outside of KTH add their organization info
%\supervisorBsOrganization{Timbuktu University, Department of
Pseudoscience}

\examinersLastname{Maguire Jr.}
\examinersFirstname{Gerald Q.}
\examinersEmail{maguire@kth.se}
% If the examiner is from within KTH add their KTHID, School and Department
info
\examinersKTHID{u100004}
\examinersSchool{\schoolAcronym{EECS}}
\examinersDepartment{Computer Science}
% other for a examiner outside of KTH add their organization info
%\examinersOrganization{Timbuktu University, Department of Pseudoscience}
```

*Figure 3: Supervisors and examiner information*

Figure 4 shows how to enter data about where the thesis is being done if outside of KTH.

**NB**: A limitation of the current template is that I do not handle multiple companies, as I assume that there is a single host company. However, you can have a list of names within the two text fields (but only a hostcompany or a hostorganization).

```
\hostcompany{Företaget AB} % Remove this line if the project was not done
at a host company
%\hostorganization{CERN}   % if there was a host organization
\date{\today}
```

*Figure 4: Information about where the thesis is taking place*

Figure 5 collects the information regarding the time, place, and language of the presentation. Note that the opponents names are simply separated by '\&' – so it is easy to have one more opponents.

```
%%%% for the oral presentation
\presentationDateAndTimeISO{2021-03-15 13:00}
\presentationLanguage{eng}
\presentationRoom{via Zoom}
%\presentationAddress{}
\presentationCity{Stockholm}

% Opponent's information
\opponentsNames{A. B. Normal \& A. X. E. Normalè}

\nationalsubjectcategories{10201, 10206}
```

*Figure 5: Information relevant to the oral presentation (both the location and the opponent or opponents)*

Finally, Figure 6 collects the information regarding the National Subject Categories – this is simply a list of 3 or 5 digit numbers separated by commas. The numbers come from https://www.scb.se/contentassets/10054f2ef27c437884e8cde0d38b9cc4/oversattningsnyckel-forskningsamnen.pdf while the Swedish and English versions are given in https://www.scb.se/contentassets/3a12f556522d4bdc887c4838a37c7ec7/standard-for-svensk-indelning--av-forskningsamnen-2011-uppdaterad-aug-2016.pdf. This information is for a required field in DiVA. Note that 5 digit codes are preferred over 3 digit codes.

```
\nationalsubjectcategories{10201, 10206}
```

*Figure 6: Information relevant to the oral presentation (both the location and the opponent or opponents)*

Figure 7 and Figure 8 show examples of abstracts that in a real thesis would be in English and Swedish with the first to appear being the abstract in the language of the thesis. Note that the actual content of these two abstracts is primarily for testing and is not meant to suggest real abstracts.

The template also supports a number of other languages (based upon the languages used for abstracts in undergraduate theses in 2020). It is straight forward to add additional language as necessary. One of the reason for having abstracts in additional languages so that dual degree students do not have to write another document for their home/other university. While the template includes a number of place holders for these other abstracts, if they are unused they can simply be deleted.

The three character code used for the language is the ISO 639-2 Code – specifically the "B" (bibliographic) variant of these codes as these seem to be the codes used in DiVA when one access the MODS formatted metadata for publications. In the example below we see "eng" being stored into a scontents buffer called "lang".

```
\begin{scontents}[store-env=lang]
eng
\end{scontents}
```

The abstract itself is stored into an scontents buffer called "abstracts" and the keywords are stored in an scontents buffer called "keywords". These buffers are part of the LaTeX scontents package and allow contents to be stored and later retrieved.

```
\begin{abstract}
  \markboth{\abstractname}{}
\begin{scontents}[store-env=lang]
eng
\end{scontents}
\begin{scontents}[store-env=abstracts,print-env=true]
All theses at KTH are \textbf{required} to have an abstract in both
\textit{English} and \textit{Swedish}.

Exchange students many want to include one or more abstracts in the language(s)
used in their home institutions to avoid the need to write another thesis when
returning to their home institution.

Keep in mind that most of your potential readers are only going to read your
\texttt{title} and \texttt{abstract}. This is why it is important that the
abstract give them enough information that they can decide is this document
relevant to them or not. Otherwise the likely default choice is to ignore the rest
of your document.

A abstract should stand on its own, i.e., no citations, cross references to the
body of the document, acronyms must be spelled out, … .

Write this early and revise as necessary. This will help keep you focused on what
you are trying to do.

Example of a formula in an abstract: $c=2 \cdot \pi \cdot r$ or \[ \int_{a}^{b}
x^2 \,dx \]
two chemical formulas: H\textsubscript{2}O or $(C_5O_2H_8)_n$, copyright symbol:
\textcopyright Maguire 2021, and some superscripts: \textsuperscript{99m}Tc,
A\textsuperscript{*},
A\textsuperscript{\textregistered}, and A\texttrademark.

Write an abstract with the following components:% key parts of the abstract
\begin{itemize}
  \item What is the topic area? (optional) Introduces the subject area for the
project.
  \item Short problem statement
  \item Why was this problem worth a Master's thesis project? (i.e., why is the
problem both significant and of a suitable degree of difficulty for a Master's
thesis project? Why has no one else solved it yet?)
  \item How did you solve the problem? What was your method/insight?
  \item Results/Conclusions/Consequences/Impact: What are your key
results/\linebreak[4]conclusions? What will others do based upon your results?
What can be done now that you have finished - that could not be done before your
thesis project was completed?
\end{itemize}
% comment at end
\end{scontents}


\subsection*{Keywords}
\begin{scontents}[store-env=keywords,print-env=true]
Canvas Learning Management System, Docker containers, performance tuning
\end{scontents}
\end{abstract}
```
*Figure 7: LaTeX to produce the English abstract*

```
 \selectlanguage{swedish}
\begin{abstract}
    \markboth{\abstractname}{}
\begin{scontents}[store-env=lang]
swe
\end{scontents}
\begin{scontents}[store-env=abstracts,print-env=true]
Alla avhandlingar vid KTH måste ha ett abstrakt på både engelska och
svenska.


If you are writing your thesis in English, you can leave this until the
final version. If you are writing your thesis in Swedish then this should
be done first – and you should revise as necessary along the way.

If you are writing your thesis in English, then this section can be a
summary targeted at a more general reader. However, if you are writing your
thesis in Swedish, then the reverse is true – your abstract should be for
your target audience, while an English summary can be written targeted at a
more general audience.

This means that the English abstract and Swedish sammnfattning
or Swedish abstract and English summary need not be literal translations of
each other.

The abstract in the language used for the thesis should be the first
abstract, while the Summary/Sammanfattning in the other language can
follow.
\end{scontents}
\subsection*{Nyckelord}
\begin{scontents}[store-env=keywords,print-env=true]
Canvas Lärplattform,Dockerbehållare, prestandajustering
\end{scontents}
\end{abstract}
```

*Figure 8: LaTeX input to produce the Swedish abstract*

## 2   Now that data is in the template, what happens?

The first thing that happens in the LaTeX code automatically generates one or more pages at the end of the PDF document that contain the data – primarily to be used to report the final approved thesis in DiVA. However, a secondary use is that if this information is added to the draft copy that is going to the opponent – then one can potentially automate many of the steps in announcing the oral presentation.

Figure 9 and Figure 10 show this information "For DIVA". The format is supposed to look like JSON.

The "organisation": {"L1": "School of Electrical Engineering and Computer Science ","L2": "Computer Science" }} that for the examiner is used to determine which local part of the KTH calendar a calendar announcement should appear in. The Cortina calendar is divided by school and then by department. Note that the department name must be in Swedish.

*Figure 9: First part of the "For DiVA" information*

```
Example of a formula in an abstract: $c=2 \cdot \pi \cdot r$ or \[ \int_{a}^{b} x^2 \,dx \]
two chemical formulas: H\textsubscript{2}O or $(C_5O_2H_8)_n$, copyright symbol: \textcopyright
Maguire 2021, and some superscripts: \textsuperscript{99m}Tc, A\textsuperscript{*},
A\textsuperscript{\textregistered}, and A\texttrademark.

Write an abstract with the following components:% key parts of the abstract
\begin{itemize}
  \item What is the topic area? (optional) Introduces the subject area for the project.
  \item Short problem statement
  \item Why was this problem worth a 'Masters thesis project? (i.e., why is the problem both
  significant and of a suitable degree of difficulty for a 'Masters thesis project? Why has no one
  else solved it yet?)
  \item How did you solve the problem? What was your method/insight?
  \item Results/Conclusions/Consequences/Impact: What are your key results/\linebreak[4]conclusions?
  What will others do based upon your results? What can be done now that you have finished - that
  could not be done before your thesis project was completed?
\end{itemize}
% comment at end

€€€€,
"Keywords[eng]": €€€€
Canvas Learning Management System, Docker containers, performance tuning €€€€,
"Abstract[swe]": €€€€

Alla avhandlingar vid KTH måste ha ett abstrakt på både engelska och svenska.

If you are writing your thesis in English, you can leave this until the final version. If you are
writing your thesis in Swedish then this should be done first - and you should revise as necessary
along the way.

If you are writing your thesis in English, then this section can be a summary targeted at a more
general reader. However, if you are writing your thesis in Swedish, then the reverse is true - your
abstract should be for your target audience, while an English summary can be written targeted at a
more general audience.

This means that the English abstract and Swedish sammnfattning
or Swedish abstract and English summary need not be literal translations of each other.

The abstract in the language used for the thesis should be the first abstract, while the
Summary/Sammanfattning in the other language can follow.

€€€€,
"Keywords[swe]": €€€€
Canvas Lärplattform,Dockerbehållare, prestandajustering €€€€,
"Abstract[fre]": €€€€

Résumé en français.

€€€€,
"Keywords[fre]": €€€€
5-6 mots-clés €€€€,
"Abstract[spa]": €€€€

Résumé en espagnol.

€€€€,
"Keywords[spa]": €€€€
5-6 Palabras claves €€€€,
"Abstract[ita]": €€€€

Sommario in italiano.

€€€€,
"Keywords[ita]": €€€€
5-6 parole chiave €€€€,
"Abstract[nor]": €€€€

Sammendrag på norsk.

€€€€,
"Keywords[nor]": €€€€
5-6 nøkkelord €€€€,
"Abstract[ger]": €€€€

Zusammenfassung in Deutsch.

€€€€,
"Keywords[ger]": €€€€
5-6 Schlüsselwörter €€€€,
"Abstract[dan]": €€€€

Abstrakt på dansk.
```

*Figure 10: Second part of the "For DiVA" information*

## 3  How did the abstracts and the keywords appear?

The `\divainfo` command that generates the For DiVA information pages has the following little bit of code that walks the set of scontents buffers using the lang scontents buffer to put the language and the corresponding abstract and keywords (see Figure 11). Originally, I used `\getstored[\i]{abstracts}` to get an abstract, but this turns out to process the LaTeX into something to render in the PDF. However, I realized that it would be far better to get the actual LaTeX source code and then process it myself into HTML for the announcement and calendars.

The \typestored command that the scontents package provides will not take a variable argument, i.e., it only takes a constant, such as \ typestored[2]{abstracts}. Unfortunately, I need to have a loop to handle the variable number of abstracts that could be used. To do this required a new command \typestoredx that evaluates the variable and the calls the internal function that gets the contents of the

correct scontents buffer! This new command is shown in Figure 12 – it uses ExplSyntax – see the LaTeX package expl3. The quad euro symbols are used as markers to avoid problems with quotation marks in the abstract itself. I have assumed that such a combination of characters will never occur in an abstract.

```
"Number of lang instances": \textquotedbl\relax\countsc{lang}\textquotedbl\relax,\\
\foreach \i in {1,...,\countsc{lang}} {
 "Abstract[\getstored[\i]{lang}]": €€€€\\
 \typestoredx{\i}{abstracts}
 €€€€,\\
 "Keywords[\getstored[\i]{lang}]": €€€€\\
 \getstored[\i]{keywords}
 €€€€,\\
 }
```

*Figure 11: Code in* `\divainfo` *command to output the abstracts and keywords*

Figure 12 also shows how to configure the listings environment to put the abstract into. One of the tricks here is that it was important to reduce the hyphenation penalty to enable the abstract text to nicely wrap text on the page. As an added benefit, the LaTeX syntax highlighting is on – so one can easily see the LaTeX commands that are used – as this might need manual editing before the event is announced.

```
\ExplSyntaxOn
\newcommand\typestoredx[2]{\expandafter\__scontents_typestored_internal:nn\expandafter{#1}
{#2}}
\ExplSyntaxOff
\makeatletter
\let\verbatimsc\@undefined
\let\endverbatimsc\@undefined
\lst@AddToHook{Init}{\hyphenpenalty=50\relax}
\makeatother


\lstnewenvironment{verbatimsc}
  {
  \lstset{%
    basicstyle=\ttfamily\tiny,
    %basicstyle=\tiny,
    %columns=fullflexible,
    columns=[l]fixed,
    language=[LaTeX]TeX,
    %numbers=left,
    %numberstyle=\tiny\color{gray},
    keywordstyle=\color{red},
    breaklines=true,           % sets automatic line breaking
    breakatwhitespace=true,        % sets if automatic breaks should only happen at whitespace
    %keepspaces=false,
    breakindent=0em,
    %fancyvrb=true
  }
}{}
```

*Figure 12: Code in the document file to set up the command \typestoredx and to configure the listing environment to put the abstract into.*

## 4    Extracting the information from the PDF file

Now that the JSON-like information is in the PDF file, the next step is to extract it. We use a command line, as shown in Figure 13, to extract the information. Figure 14 shows an example of the resulting file.

```
./extract_pseudo_JSON-from_PDF.py --pdf test5.pdf --json event.json
```

*Figure 13: Extract the JSON like information*

```
{"Author1": {"Last name": "Student", "First name": "Fake A.", "Local User Id": "u100001", "E-mail":
"a@kth.se", "ORCiD": "0000-0002-00001-1234", "organisation": {"L1": "School of Electrical Engineering
and Computer Science "}}, "Author2": {"Last name": "Student", "First name": "Fake B.", "Local User Id":
"u100002", "E-mail": "b@kth.se", "ORCiD": "0000-0002-00001-5678", "organisation": {"L1": "School of
Architecture and the Built Environment "}}, "Degree": {"Educational program": "Bachelor's Programme in
Information and Communication Technology"}, "Title": {"Main title": "This is the title in the language
of the thesis", "Subtitle": "An subtitle in the language of the thesis", "Language": "eng"},
"Alternative title": {"Main title": "Detta är den svenska översättningen av titeln", "Subtitle": "Detta
är den svenska översättningen av undertiteln", "Language": "swe"}, "Supervisor1": {"Last name":
"Supervisor", "First name": "A. Busy", "Local User Id": "u100003", "E-mail": "sa@kth.se",
"organisation": {"L1": "School of Electrical Engineering and Computer Science ", "L2": "Computer
Science"}}, "Supervisor2": {"Last name": "Supervisor", "First name": "Another Busy", "Local User Id":
"u100003", "E-mail": "sb@kth.se", "organisation": {"L1": "School of Architecture and the Built
Environment ", "L2": "Public Buildings"}}, "Examiner1": {"Last name": "Maguire Jr.", "First name":
"Gerald Q.", "Local User Id": "u100004", "E-mail": "maguire@kth.se", "organisation": {"L1": "School of
Electrical Engineering and Computer Science ", "L2": "Computer Science"}}, "Cooperation":
{"Partner_name": "Företaget AB"}, "Other information": {"Year": "2021", "Number of pages":
"xxxiii,35"}, "Opponents": {"Name": "A. B. Normal & A. X. E. Normalè"}, "Presentation": {"Date": "2021-
03-16 13:00", "Language": "eng", "Room": "via Zoom", "City": "Stockholm"}, "Number of lang instances":
"10", "abstracts": {"eng": "<p>All theses at KTH are <bold>required</bold> to have an abstract in both
<i>English</i> and <i>Swedish</i>.</p><p>Exchange students many want to include one or more abstracts
in the language(s) used in their home institutions to avoid the need to write another thesis when
returning to their home institution.</p><p>Keep in mind that most of your potential readers are only
going to read your <tt>title</tt> and <tt>abstract</tt>. This is why it is important that the abstract
give them enough information that they can decide is this document relevant to them or not. Otherwise
the likely default choice is to ignore the rest of your document.</p><p>A abstract should stand on its
own, i.e., no citations, cross references to the body of the document, acronyms must be spelled out, …
.</p><p>Write this early and revise as necessary. This will help keep you focused on what you are
trying to do.</p><p>Example of a formula in an abstract: $c=2 \\cdot \\pi \\cdot r$ or \\[
\\int_{a}^{b} x^2 \\,dx \\] two chemical formulas: H<sub>2</sub>O or $(C_5O_2H_8)_n$, copyright symbol:
&copy; Maguire 2021, and some superscripts: <sup>99m</sup>Tc, A<sup>*</sup>, A<sup>&reg;</sup>, and
A&trade;.</p><p>Write an abstract with the following components: </p><ul><li> What is the topic area?
(optional) Introduces the subject area for the project. </li><li> Short problem statement </li><li> Why
was this problem worth a 'Masters thesis project? (i.e., why is the problem both significant and of a
suitable degree of difficulty for a 'Masters thesis project? Why has no one else solved it yet?)
</li><li> How did you solve the problem? What was your method/insight? </li><li>
Results/Conclusions/Consequences/Impact: What are your key results/conclusions? What will others do
based upon your results? What can be done now that you have finished - that could not be done before
your thesis project was completed?</li></ul>", "swe": "<p>Alla avhandlingar vid KTH måste ha ett
abstrakt på både engelska och svenska.</p><p>If you are writing your thesis in English, you can leave
this until the final version. If you are writing your thesis in Swedish then this should be done first
– and you should revise as necessary along the way.</p><p>If you are writing your thesis in English,
then this section can be a summary targeted at a more general reader. However, if you are writing your
thesis in Swedish, then the reverse is true – your abstract should be for your target audience, while
an English summary can be written targeted at a more general audience.</p><p>This means that the
English abstract and Swedish sammnfattning or Swedish abstract and English summary need not be literal
translations of each other.</p><p>The abstract in the language used for the thesis should be the first
abstract, while the Summary/Sammanfattning in the other language can follow.</p>", "fre": "<p>Résumé en
français.</p>", "spa": "<p>Résumé en espagnol.</p>", "ita": "<p>Sommario in italiano.</p>", "nor":
"<p>Sammendrag på norsk.</p>", "ger": "", "dan": "<p>Abstrakt på dansk.</p><p>Zusammenfassung in
Deutsch.</p>", "dut": "<p>Samenvatting in het Nederlands.</p><p>Eesti keeles kokkuvõte.</p>", "est":
""}, "keywords": {"eng": "Canvas Learning Management System, Docker containers, performance tuning ",
"swe": "Canvas Lärplattform,Dockerbehållare, prestandajustering ", "fre": "5-6 mots-clés ", "spa": "5-6
Palabras claves ", "ita": "5-6 parole chiave ", "nor": "5-6 nøkkelord ", "ger": "5-6 Schlüsselwörter ",
"dan": "5-6 Søgeord ", "dut": "5-6 trefwoorden ", "est": "5-6 Märksõnad "}}
```

*Figure 14: Example event.json output*

# 5    What can we do with this event.json file?

Now that you have a JSON file, you can edit the HTML to deal with equations and things that were not automatically processed by the extraction program.

Once you are happy with the JSON file contents, the next step is to generate something interesting with this data – for this we use the program `JSON_to_calendar.py`.
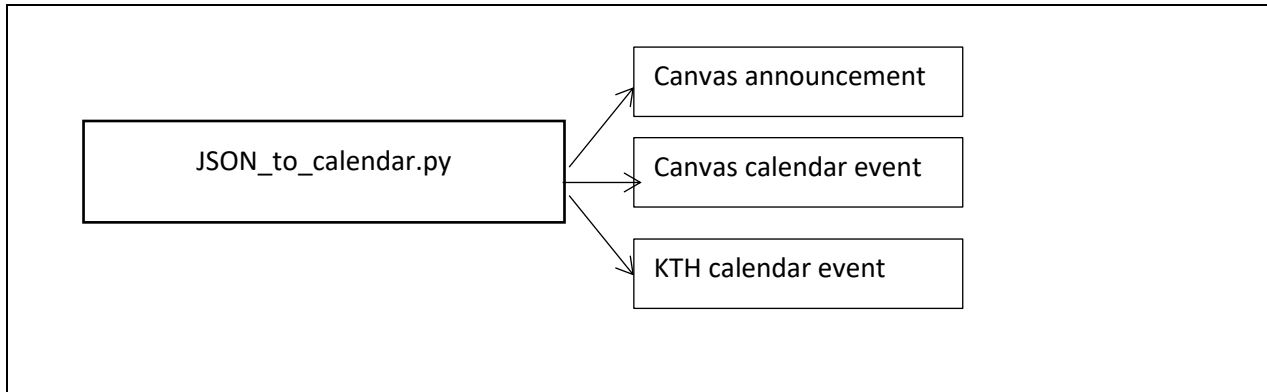


*Figure 15: The several outputs of `JSON_to_calendar.py`*

We can produce all three outputs with the command shown in Figure 16. Note that the program was run with the event.json file to produce a Canvas course announcement, as shown in Figure 17. Note that this is being run in the Canvas test instance (hence the pink bar across the bottom of the figure).

```
JSON_to_calendar.py -c 11 --config config-test.json
```
*Figure 16: Funning JSON_to_calendar.py to produce all three outputs*

**Announcements** › Bachelor's thesis presentation/Kandidate Examensarbete presentation on 2021-03-15 at 13:00

✎ Edit    ⋮

## Bachelor's thesis presentation/Kandidate Examensarbete presentation on 2021-03-15 at 13:00

Gerald Quentin Maguire Jr

All Sections

May 6 at 1:13pm

```
Student:      Fake A. Student & Fake B. Student
Title:  This is the title in the language of the thesis: An subtitle in the language of the thesis
Titl:   Detta är den svenska översättningen av titeln: Detta är den svenska översättningen av undertiteln
Place:  via Zoom
Examiner:     Gerald Q. Maguire Jr.
Academic Supervisor:   A. Busy Supervisor & Another Busy Supervisor
Opponent:     A. B. Normal & A. X. E. Normalè
Language:     English
```

## Abstract

All theses at KTH are required to have an abstract in both *English* and *Swedish*.

Exchange students many want to include one or more abstracts in the language(s) used in their home institutions to avoid the need to write another thesis when returning to their home institution.

Keep in mind that most of your potential readers are only going to read your `title` and `abstract`. This is why it is important that the abstract give them enough information that they can decide is this document relevant to them or not. Otherwise the likely default choice is to ignore the rest of your document.

A abstract should stand on its own, i.e., no citations, cross references to the body of the document, acronyms must be spelled out, ... .

Write this early and revise as necessary. This will help keep you focused on what you are trying to do.

Example of a formula in an abstract: $c=2 \cdot \pi \cdot r$ or $\[ \int_{a}^{b} x^2 \,dx \]$ two chemical formulas: $H_2O$ or $(C_5O_2H_8)_n$, copyright symbol: © Maguire 2021, and some superscripts: $^{99m}Tc$, $A^*$, $A^®$, and $A^™$.

Write an abstract with the following components:

- What is the topic area? (optional) Introduces the subject area for the project.
- Short problem statement
- Why was this problem worth a 'Masters thesis project? (i.e., why is the problem both significant and of a suitable degree of difficulty for a 'Masters thesis project? Why has no one else solved it yet?)

## Sammanfattning

Alla avhandlingar vid KTH måste ha ett abstrakt på både engelska och svenska.

If you are writing your thesis in English, you can leave this until the final version. If you are writing your thesis in Swedish then this should be done first – and you should revise as necessary along the way.

If you are writing your thesis in English, then this section can be a summary targeted at a more general reader. However, if you are writing your thesis in Swedish, then the reverse is true – your abstract should be for your target audience, while an English summary can be written targeted at a more general audience.

This means that the English abstract and Swedish sammnfattning or Swedish abstract and English summary need not be literal translations of each other.

The abstract in the language used for the thesis should be the first abstract, while the Summary/Sammanfattning in the other language can follow.

*Figure 17: Canvas course announcement*

Figure 17 and Figure 18  show the event in the Canvas calendar (when I have selected to display the events for course 11 in green).



*Figure 18: A course event in the Canvas calendar (the figure is zoomed in on 15 March 2021*



*Figure 19: Zoomed view of the opened Canvas calendar event*

I also edited the event.json to create an event on the following data. The result is two Calendar events as shown in KTH's Cortina calendar (in this case, it is in the development version of the Polopoly web – as this is the only place where I can use the as of yet unreleased Cortina API which is being developed by KTH's IT unit. Figure 21 and Figure 22 show the English and Swedish versions of the event in the calendar.s
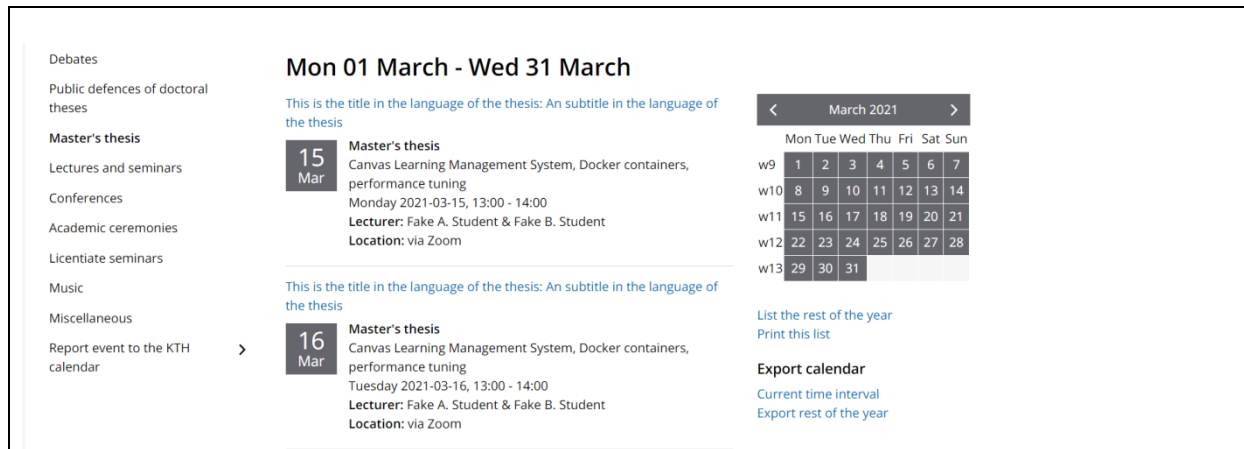


*Figure 20: KTH's Cortina calendar showing two degree project events*
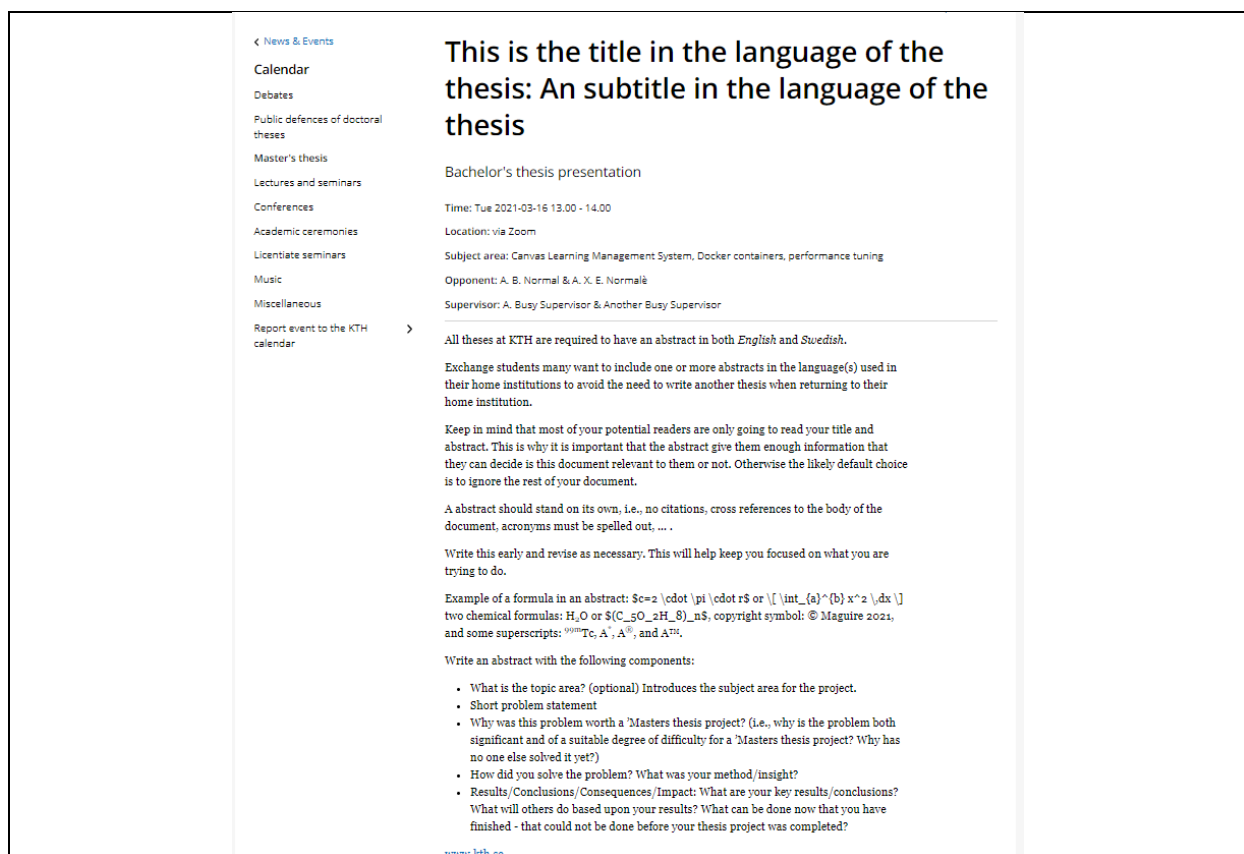


*Figure 21: English version of the calendar*

*Figure 22: Swedish version of the calendar event*

Figure 23 shows the response from doing a POST to the KTH Cortina API. Note that this is a prototype and as of the date of my experiments did not yet support having an examiner in a calendar event (hence I had to save and remove this element of the dict before passing the data to the API, then I restored this element for use by the subsequent routines).

```
{
  "advisor": "A. Busy Supervisor & Another Busy Supervisor",
  "contentId": "1.1010375",
  "contentName": {
    "en_GB": "This is the title in the language of the thesis: An subtitle in the language of the
thesis",
    "sv_SE": "Detta är den svenska översättningen av titeln: Detta är den svenska översättningen av
undertiteln"
  },
  "dates_endtime": "2021-03-16T13:00:00.000Z",
  "dates_starttime": "2021-03-16T12:00:00.000Z",
  "lead": {
    "en_GB": "Bachelor's thesis presentation",
    "sv_SE": "Kandidate Examensarbete presentation"
  },
  "lecturer": "Fake A. Student & Fake B. Student",
  "location": "via Zoom",
  "opponent": "A. B. Normal & A. X. E. Normalè",
  "organisation": {
    "school": "EECS",
    "department": "Datavetenskap"
  },
  "respondent": "",
  "respondentDepartment": "",
  "subjectarea": {
    "en_GB": "Canvas Learning Management System, Docker containers, performance tuning ",
    "sv_SE": "Canvas Lärplattform,Dockerbehållare, prestandajustering "
  },
  "seminartype": "thesis",
  "paragraphs_text": {
    "en_GB": "<p>All theses at KTH are required to have an abstract in both <i>English</i> and
<i>Swedish</i>.</p> \n<p>Exchange students many want to include one or more abstracts in the
language(s) used in their home institutions to avoid the need to write another thesis when returning to
their home institution.</p> \n<p>Keep in mind that most of your potential readers are only going to
read your title and abstract. This is why it is important that the abstract give them enough
information that they can decide is this document relevant to them or not. Otherwise the likely default
choice is to ignore the rest of your document.</p> \n<p>A abstract should stand on its own, i.e., no
citations, cross references to the body of the document, acronyms must be spelled out, … .</p>
\n<p>Write this early and revise as necessary. This will help keep you focused on what you are trying
to do.</p> \n<p>Example of a formula in an abstract: $c=2 \\cdot \\pi \\cdot r$ or \\[ \\int_{a}^{b}
x^2 \\,dx \\] two chemical formulas: H<sub>2</sub>O or $(C_5O_2H_8)_n$, copyright symbol: © Maguire
2021, and some superscripts: <sup>99m</sup>Tc, A<sup>*</sup>, A<sup>®</sup>, and A™.</p> \n<p>Write an
abstract with the following components: </p> \n<ul> \n <li> What is the topic area? (optional)
Introduces the subject area for the project. </li> \n <li> Short problem statement </li> \n <li> Why
was this problem worth a 'Masters thesis project? (i.e., why is the problem both significant and of a
suitable degree of difficulty for a 'Masters thesis project? Why has no one else solved it yet?) </li>
\n <li> How did you solve the problem? What was your method/insight? </li> \n <li>
Results/Conclusions/Consequences/Impact: What are your key results/conclusions? What will others do
based upon your results? What can be done now that you have finished - that could not be done before
your thesis project was completed?</li> \n</ul>\n",
    "sv_SE": "<p>Alla avhandlingar vid KTH måste ha ett abstrakt på både engelska och svenska.</p>
\n<p>If you are writing your thesis in English, you can leave this until the final version. If you are
writing your thesis in Swedish then this should be done first – and you should revise as necessary
along the way.</p> \n<p>If you are writing your thesis in English, then this section can be a summary
targeted at a more general reader. However, if you are writing your thesis in Swedish, then the reverse
is true – your abstract should be for your target audience, while an English summary can be written
targeted at a more general audience.</p> \n<p>This means that the English abstract and Swedish
sammnfattning or Swedish abstract and English summary need not be literal translations of each
other.</p> \n<p>The abstract in the language used for the thesis should be the first abstract, while
the Summary/Sammanfattning in the other language can follow.</p>\n"
  },
  "uri": "https://www.kth.se"
}
```

*Figure 23: Response from the KTH Cortina API*

## 6    Change in how to enter the abstracts in LaTeX

In order to deal with both babl and Polyglossia and both bibtex and biblatex, I have changed how the abstracts should be entered. Basically the idea is to insert a \babelpolyLangStart{language_name} before the start of the abstract and \*babelpolyLangStop* after the end of the abstract. These macros hide the difference between using Babel or Polyglossia. Additionally, they avoid the problem of the Overleaf GUI being confused about matching beginning and ending statements. Figure 24 and Figure 25 show examples of how to enter an abstract and keywords while Figure 26 shows the defition of the two macros.

Note that both Babel and Polyglossia expand the \abstractname into the correct version of the name for an abstract in the current language. Unfortunately, neither package has an equivalent to provide the language specific version of "keywords", so these have to be provided by the person entering the keywords.

```
\babelpolyLangStart{swedish}
\begin{abstract}
    \markboth{\abstractname}{}
\begin{scontents}[store-env=lang]
swe
\end{scontents}
\begin{scontents}[store-env=abstracts,print-env=true]
Alla avhandlingar vid KTH måste ha ett abstrakt på både engelska och
svenska.

Om du skriver din avhandling på svenska ska detta göras först (och placera
det som det första abstraktet) - och du bör revidera det vid behov.

If you are writing your thesis in English, you can leave this until the
draft version that goes to your opponent for the written opposition. In
this way you can provide the English and Swedish abstract/summary
information that can be used in the announcement for your oral
presentation.

If you are writing your thesis in English, then this section can be a
summary targeted at a more general reader. However, if you are writing your
thesis in Swedish, then the reverse is true – your abstract should be for
your target audience, while an English summary can be written targeted at a
more general audience.

This means that the English abstract and Swedish sammnfattning
or Swedish abstract and English summary need not be literal translations of
each other.

The abstract in the language used for the thesis should be the first
abstract, while the Summary/Sammanfattning in the other language can
follow.
\end{scontents}
\subsection*{Nyckelord}
\begin{scontents}[store-env=keywords,print-env=true]
Canvas Lärplattform,Dockerbehållare, prestandajustering
\end{scontents}
\end{abstract}
\babelpolyLangStop{swedish}
```

*Figure 24. Example of the revised format for entering an abstract*

```
\todo[inline]{Use the relevant language for abstracts for your home
university.\\
Note that you may need to augment the set of language used in polyglossia
or
babel (see the file kththesis.cls). The following languages include those
languages that were used in theses at KTH in 2018-2019, except for one in
Chinese.\\
Remove those versions that you do not need.\\
If adding a new language, when specifying the language for the abstract use
the three letter ISO 639-2 Code – specifically the "B" (bibliographic)
variant of these codes (note that this is the same language code used in
DiVA).
\babelpolyLangStart{french}
\begin{abstract}
    \markboth{\abstractname}{}
\begin{scontents}[store-env=lang]
fre
\end{scontents}
\begin{scontents}[store-env=abstracts,print-env=true]
Résumé en français.
\end{scontents}
\subsection*{Mots clés}
\begin{scontents}[store-env=keywords,print-env=true]
5-6 mots-clés
\end{scontents}
\end{abstract}
\babelpolyLangStop{french}
\cleardoublepage
```

*Figure 25. Second example of the revised format for entering an abstract*

```
\ifxeorlua
  \newcommand{\babelpolyLangStop}[1]{\end{#1}}
\else
  \newcommand{\babelpolyLangStop}[1]{\end{otherlanguage}}
\fi

\ifxeorlua
  \newcommand{\babelpolyLangStart}[1]{\begin{#1}}
\else
  \newcommand{\babelpolyLangStart}[1]{\begin{otherlanguage}{#1}}
\fi
```

*Figure 26: The two macros used to help enter the language specification*

## 7   Adding keywords and PDF meta data

In an effort to add the PDF meta via the hyperref package, I also decided to add the keywords part of the PDF meta. However, in order to do this I had to have the keywords before the `\begin{document}` command in the LaTeX file. To do so, I added three new commands to the `kththesis.cls` file, as shown in Figure 27. The commands are used in the examplethesis.tex file to set up the keywords in both English and Swedeish as well as include a new set of LaTeX commands to store the PDF meta data (as shown in Figure 28) using a file called `lib/pdf_related_includes.tex` (shown in Figure 29). Later the keywords that have been stored are inserted into the LaTeX after their

respective language abstracts as shown in Figure 30 and Figure 31. The title page of the thesis and the PDF meta data are shown in Figure 32 Finally, the keywords appear (as expected) in the for DiVA data at the end of the PDF file as shown in Figure 33.

Note that \makeatletter and \makeatother are use to include the character "@" as a letter and then return "@" to being a punction code. This use of "@" protects the internal names from being accessed outside of these two commands. More explicitly, \EnglishKeywords is a function that takes one argument, the text of the English keywords, and then stores them into "@EnglishKeywords". Later the text can be retried with the command \InsertKeywords{english} or \InsertKeywords{swedish}.

```
% Keywords
\let\@EnglishKeywords\@empty
\newcommand{\EnglishKeywords}[1]{\def\@EnglishKeywords{#1}}

\let\@SwedishKeywords\@empty
\newcommand{\SwedishKeywords}[1]{\def\@SwedishKeywords{#1}}

\makeatletter
\newcommand{\InsertKeywords}[1]{
    \IfEqCase{#1}{%
    {english}{\@EnglishKeywords}
    {swedish}{\@SwedishKeywords}
  }[\typeout{argument must be english or swedish}]
}
```
*Figure 27: New commands in kththesis.cls*

Figure 28 shows the storing of the keywords using the above commands and the include of the library to set up the PDF meta data.

```
% Enter the English and Swedish keywords here for use in the PDF meta data
_and_ for later use
% following the respective abstract.
% Try to put the words in the same order in both to facilitate matching.
\EnglishKeywords{Canvas Learning Management System, Docker containers,
performance tuning}
\SwedishKeywords{Canvas Lärplattform, Dockerbehållare, prestandajustering}

% Put the title, author, and keyword information into the PDF meta
information
\include{lib/pdf_related_includes}
```
*Figure 28: New additions to examplethesis.text*

The lib/pdf_related_includes.tex file contains the LaTeX to add information to the PDF file (specifically, author(s), title(s), and keywords). It uses the hyperref package and should be be included before the \begin{document}.

I want to acknowledge the inspiration of Karl Voit's template for TU Graz that inspired me to add the PDF document information. For more information about his template see https://github.com/novoid/LaTeX-KOMA-template

Note that this template does not use anything from his template other than the names of the information for the PDF meta fields, i.e., mytitle, myauthor, and mykeywords together with the idea of defining the corresponding newcommand to set the relevant hyperref parameters. A result is that these command names are visible to the rest of the LaTeX file.

```
\makeatletter
\ifx\@subtitle\@empty
    \newcommand{\mytitle}{\@title}
\else
    \newcommand{\mytitle}{\@title: \@subtitle}
\fi


\hypersetup{
    pdftitle={\mytitle}         % Title field
}

\ifx\@secondAuthorsLastname\@empty
    \newcommand{\myauthor}{\@authorsFirstname \@authorsLastname}
\else
    \ifinswedish
    \newcommand{\myauthor}{\@authorsFirstname\space\@authorsLastname\space\relax
och\space\@secondAuthorsFirstname \@secondAuthorsLastname}
    \else
        \newcommand{\myauthor}{\@authorsFirstname\space\@authorsLastname\space\relax
and\space\@secondAuthorsFirstname \@secondAuthorsLastname}
    \fi
\fi


\hypersetup{
    pdfauthor={\myauthor}       % Author field
}

% Put the alternative title (and subtitle) into the PDF Subject meta
\ifx\@altsubtitle\@empty\relax
    \newcommand{\myalttitle}{\@alttitle}
\else
    \newcommand{\myalttitle}{\@alttitle: \@altsubtitle}
\fi


\hypersetup{
    pdfsubject={\myalttitle}        % Subject field
}

\ifx\@EnglishKeywords\@empty
    \ifx\@SwedishKeywords\@empty
        \newcommand{\mykeywords}{}
    \else
    \newcommand{\mykeywords}{\@SwedishKeywords}
    \fi
\else
    \ifx\@SwedishKeywords\@empty
        \newcommand{\mykeywords}{\@EnglishKeywords}
    \else
        \ifinswedish
            \newcommand{\mykeywords}{\@SwedishKeywords, \@EnglishKeywords}
        \else
            \newcommand{\mykeywords}{\@EnglishKeywords, \@SwedishKeywords}
        \fi
    \fi
\fi
\makeatother

\hypersetup{
    pdfkeywords={\mykeywords}           % Keywords field
}
```

*Figure 29: lib/pdf_related_includes.tex (edited for readability)*

```
\subsection*{Keywords}
\begin{scontents}[store-env=keywords,print-env=true]
% If you set the EnglishKeywords earlier, you can retrieve them with:
% Alternative 1:
%\makeatletter
%\@EnglishKeywords
%\makeatother
%
% Alternative 2:
\InsertKeywords{english}
% If you did not set the EnglishKeywords earlier then simply enter the
keywords here:
% Alternative 3:
% comma separate keywords, such as: Canvas Learning Management System,
Docker containers, performance tuning
\end{scontents}
```

*Figure 30: Including the English language keywords below the English abstract*

```
\subsection*{Nyckelord}
\begin{scontents}[store-env=keywords,print-env=true]
% SwedishKeywords were set earlier, hence we can use alternative 2
\InsertKeywords{swedish}
\end{scontents}
\end{abstract}
```

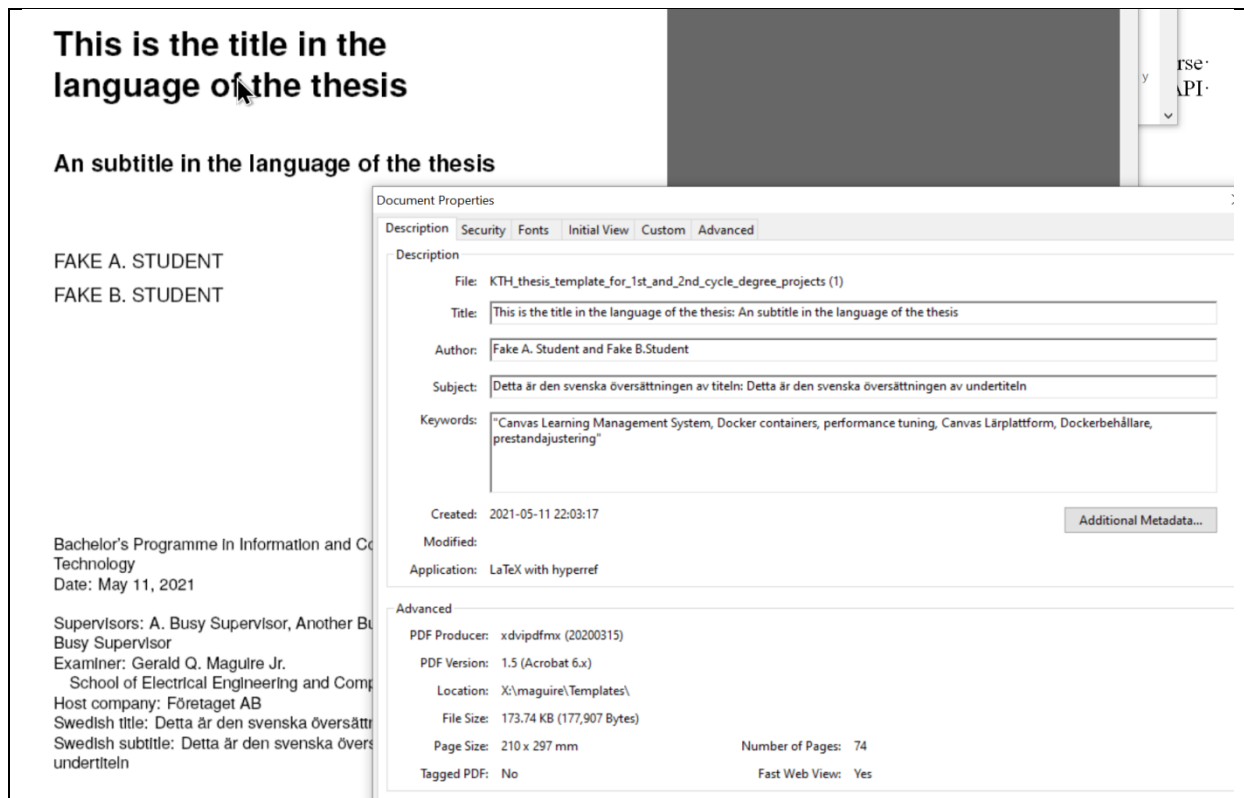*Figure 31: Including the Swedeish language keywords below the Swedish abstract*

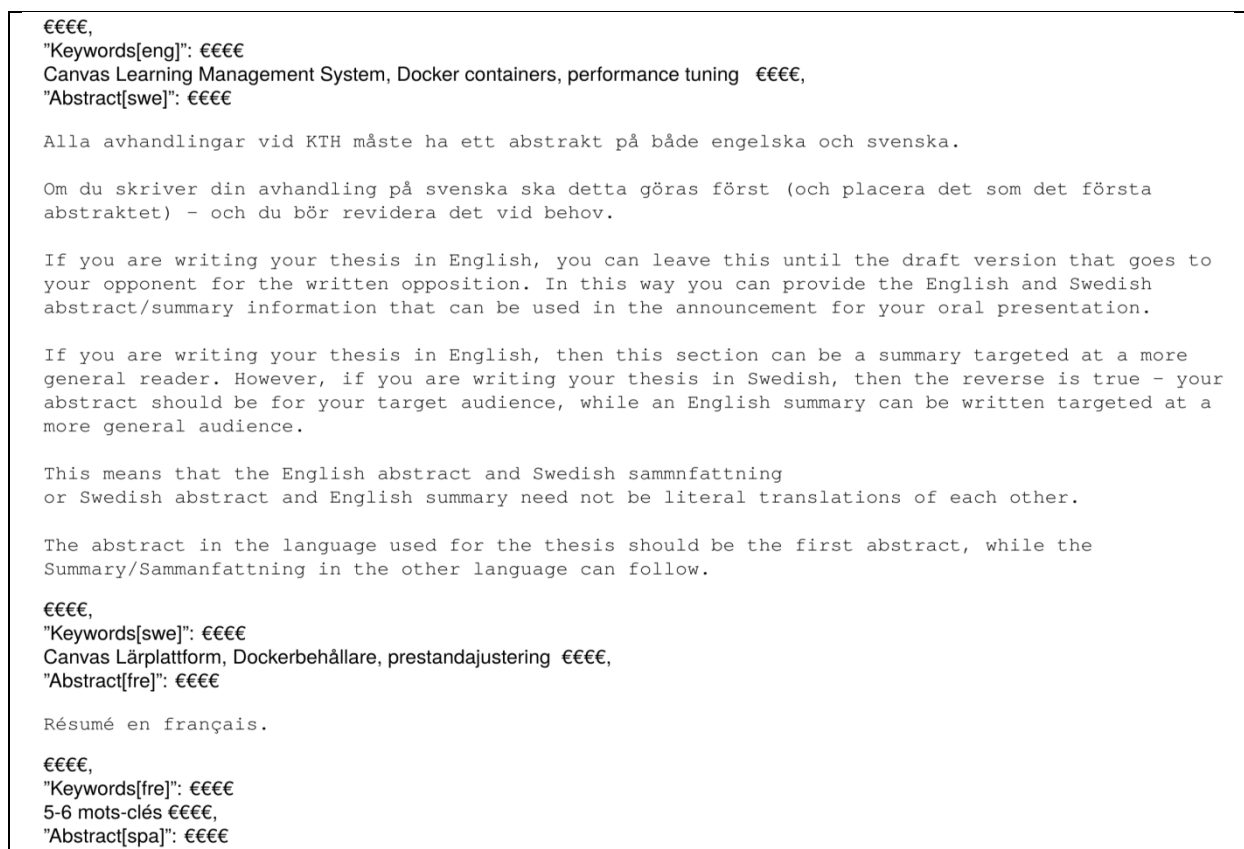*Figure 32: The title page of the thesis and the PDF meta data*



*Figure 33: The keywords appear as expected in the for DiVA data at the end of the PDF file*

# 8    Other variants of the JSON_to_calendar.py

For testing purposes, I also created functionality in JSON_to_calendar.py to insert a fixed event (this was my first test) and take in a MODS file. The MODS file was created from a DiVA feed of theses presented in 2020 through to the 25$^{th}$ of April. However, one limitation that I found is that other than myself, few people have been entering the date and time for the oral presentation. Since I wanted to test making calendar announcements, I needed data and time!

**NB**: I have assumed that each degree project presentation lasts one hour – since the KTH Cortina calendar needs both a starting and ending time.

These other variants probably should not be kept, but rather the architecture should be similar to that shown in Figure 34. Additionally, when taking data from other types of sources, one can take advantage of the data that is in a Canvas degree project course to help out the processing of the source data.
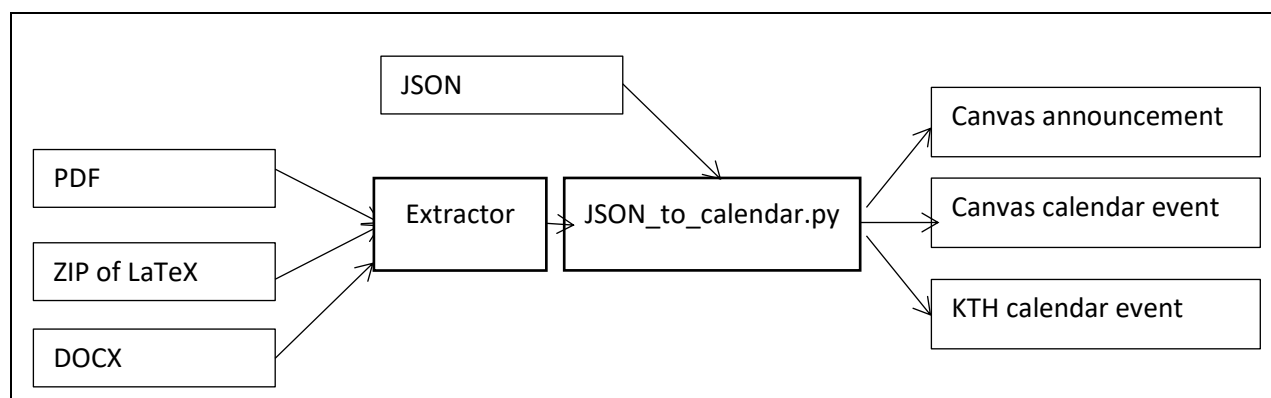


*Figure 34: Several possible inputs to* `JSON_to_calendar.py` *and its outputs*

# 9    Can someone else use these programs?

The source code is at https://github.com/gqmaguirejr/E-learning

Any users with the Canvas permissions to post announcements in a course and insert course calendar events can use the Canvas-related functionality. However, the KTH Cortina Calendar API requires an access key (which you have to get from the IT unit).

# 10   LaTeX template in Overleaf

The template used to make the examples in this document is at:

https://www.overleaf.com/read/xmrfhcchgnvq

**NB**: This is where I do experiments with the template and is not intended to be stable.