Modifying DOCX custom document properties

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Given that the thesis template and the integrated cover and thesis template have a set of custom Doc Properties (here after DocProp), one thought was to be able to generate pre-customized DOCX files that could contain information that was already know. For example, if one knows the name of the student or students who will be the authors this information could be "injected" into the custom DocProp file. The idea was that such a pre-configured file could be given to the student and they would not need to enter this information themselves.

1 Extracting custom DocProp

Extracting custom DocProp from an existing file can be done using a program such as `extract_custom_DOCX_properties.py`, as shown in Figure 1. In this case zb1.docx is a copy of `Template-thesis-English-2022-with-cover_and_for-DiVA-v2.docx` (the integrated cover and thesis template. This produced a JSON file whose contents are shown in Figure 2.

```
./extract_custom_DOCX_properties.py --file zb1.docx
```

Figure 1: Command to extract the existing custom DocProp from a DOCX file

```
{"2": {"ZOTERO_PREF_1": "&lt;data data-version=\"3\" zotero-version=\"4.0.29.16\"&gt;&lt;session
id=\"txwJq0tU\"/&gt;&lt;style id=\"http://people.kth.se/~maguire/ExampleStyle-with-access.csl\"
hasBibliography=\"1\" bibliographyStyleHasBeenSet=\"1\"/&gt;&lt;prefs&gt;&lt;pref name=\"fieldType\"
value=\"Field\"/&gt;&lt;pref name=\""}, "3": {"ZOTERO_PREF_2": "storeReferences\"
value=\"true\"/&gt;&lt;pref name=\"automaticJournalAbbreviations\" value=\"true\"/&gt;&lt;pref
name=\"noteType\" value=\"\"/&gt;&lt;/prefs&gt;&lt;/data&gt;"}, "4": {"Subtitle": "An subtitle in the
language of the thesis"}, "5": {"Alternative_main_title": "Detta är den svenska översättningen av
titeln"}, "6": {"Alternative_subtitle": "Detta är den svenska översättningen av undertiteln"}, "7":
{"Author1_Last_name": "Student"}, "8": {"Author1_First_name": "Fake A."}, "9": {"Author1_Local User
Id": "u100001"}, "10": {"Author1_E-mail": "a@kth.se"}, "11": {"Author1_organization_L1": "School of
Electrical Engineering and Computer Science"}, "12": {"Author1_organization_L2": "&lt;NA&gt;"}, "13":
{"Author1_Other_organisation": "&lt;NA&gt;"}, "14": {"Author2_Last_name": "Student"}, "15":
{"Author2_First_name": "Fake B."}, "16": {"Author2_E-mail": "b@kth.se"}, "17":
{"Author2_organization_L1": "School of Architecture and the Built Environment"}, "18":
{"Author2_organization_L2": "&lt;NA&gt;"}, "19": {"Author2_Other_organisation": "&lt;NA&gt;"}, "20":
{"Author2_Local User Id": "u100002"}, "21": {"Cooperation_Partner_name": "Företaget AB"}, "22":
{"Cycle": "1"}, "23": {"Course_code": "IA150X"}, "24": {"Credits": "15"}, "25": {"programcode":
"TCOMK"}, "26": {"Educational program": "Bachelor’s Programme in Information and Communication
Technology"}, "27": {"Degree": "Bachelors degree"}, "28": {"subjectArea": "Information and
Communication Technology"}, "29": {"Second_programcode": "LÄGER"}, "30": {"Second_Educational_program":
"Second_Educational_program"}, "31": {"Second_degree": "Master of Science in Engineering and in
Education"}, "32": {"Second_subjectarea": "Mathematics and Chemistry"}, "33": {"Examiner1_Last_name":
"Maguire Jr."}, "34": {"Examiner1_First_name": "Gerald Q."}, "35": {"Examiner1_Local User Id":
"u1d13i2c"}, "36": {"Examiner1_E-mail": "maguire@kth.se"}, "37": {"Examiner1_organization_L1": "School
of Electrical Engineering and Computer Science"}, "38": {"Examiner1_organization_L2": "Computer
Science"}, "39": {"Supervisor1_Last_name": "Supervisor"}, "40": {"Supervisor1_First_name": "A. Busy"},
"41": {"Supervisor1_Local User Id": "u100003"}, "42": {"Supervisor1_E-mail": "sa@kth.se"}, "43":
{"Supervisor1_organization_L1": "School of Electrical Engineering and Computer Science"}, "44":
{"Supervisor1_organization_L2": "Computer Science"}, "45": {"Supervisor1_Other_organisation":
"&lt;NA&gt;"}, "46": {"Supervisor2_Last_name": "Supervisor"}, "47": {"Supervisor2_First_name": "Another
Busy"}, "48": {"Supervisor2_Local User Id": "u100003"}, "49": {"Supervisor2_E-mail": "sb@kth.se"},
"50": {"Supervisor2_organization_L1": "School of Architecture and the Built Environment"}, "51":
{"Supervisor2_organization_L2": "Architecture"}, "52": {"Supervisor2_Other_organisation":
"&lt;NA&gt;"}, "53": {"Supervisor3_Last_name": "Supervisor"}, "54": {"Supervisor3_First_name": "Third
Busy"}, "55": {"Supervisor3_Local User Id": "uxxxxx"}, "56": {"Supervisor3_E-mail": "sc@tu.va"}, "57":
{"Supervisor3_organization_L1": "&lt;NA&gt;"}, "58": {"Supervisor3_organization_L2": "&lt;NA&gt;"},
"59": {"Supervisor3_Other_organisation": "Timbuktu University, Department of Pseudoscience"}, "60":
{"Opponents_Name": "A. B. Normal &amp; A. X. E. Normalè"}, "61": {"Presentation_Date": "2021-03-15
13:00"}, "62": {"Presentation_Language": "eng"}, "63": {"Presentation_Room": "via Zoom https://kth-
se.zoom.us/j/ddddddddddd"}, "64": {"Presentation_Address": "Isafjordsgatan 22 (Kistagången 16)"}, "65":
{"Presentation_City": "Stockholm"}, "66": {"Series_name": "EECS-EX"}, "67": {"Number_in_series":
"2021:00"}, "68": {"National Subject Categories": "10201, 10206"}}
```

Figure 2: `zb1-extracted.json`

The extraction works by getting the names of the DocProp and their values from the file within the ZIP archive of the DOCX file. The specific file is: '`docProps/custom.xml`'.

2 Generate a modified JSON file with the DOCProp contents that you want

Next we generated a JSON file that will be used later to modify a DOCX file. In this case, the file is called `zb1-customize.json`. In this case, the first names of the two authors have been changed. These changes are highlighted in the figure.

```
{"7": {"Author1_Last_name": "Student"}, "8": {"Author1_First_name":
"Fake C."}, "9": {"Author1_Local User Id": "u100001"}, "10":
{"Author1_E-mail": "a@kth.se"}, "11": {"Author1_organization_L1":
"School of Electrical Engineering and Computer Science"}, "12":
{"Author1_organization_L2": "&lt;NA&gt;"}, "13":
{"Author1_Other_organisation": "&lt;NA&gt;"}, "14":
{"Author2_Last_name": "Student"}, "15": {"Author2_First_name": "Fake
D."}, "16": {"Author2_E-mail": "b@kth.se"}}
```

Figure 3: `zb1-customize.json` *(showing just part of the file).*

3 Modifying the DOCX file

The next step is to actually make the desired changes in the DocProp values. This is done using the program `customize_DOCX_file.py` with a command such as shown in Figure 4. The command produces a file called `zb1-modfied.docx`.

```
./customize_DOCX_file.py --json zb1-customize.json --file zb1.docx
```

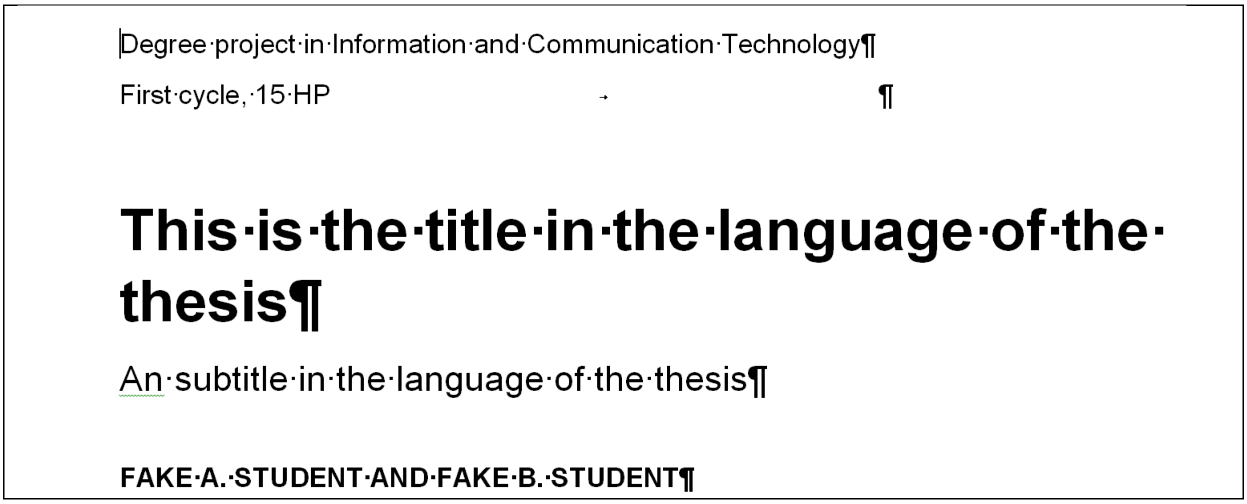
Figure 4: Command to customize a DOCX file

4 Viewing the modified DOCX file

When we view the file zb1-modfied.docx in Word we see the unexpected results shown in Figure 5. This is unexpected because the first names of the authors do not appear to be changed.

Unfortunately, even if we do **`Cntrl-A`** (to selected all the content in the document) and then type **`F9`** to update all of the fields, the fields are **not** updated! However, if we explicitly selected the contents of the authors control box and type **`F9`**, the fields are updated.

So what is going on? It seems that this is a problem with Word and is well document in many postings about this problem. There are three solutions: (1) find all of the fields and manually selected them and update the fields, (2) use a macro (such as shown in Figure 6 or Figure 7)*, or (3) simply set up the document to update fields before printing (see Figure 8 and Figure 9) and then initiate printing. The results is shown in



Degree·project·in·Information·and·Communication·Technology¶

First·cycle,·15·HP ¶

This·is·the·title·in·the·language·of·the·thesis¶

An·subtitle·in·the·language·of·the·thesis¶

FAKE·A.·STUDENT·AND·FAKE·B.·STUDENT¶

Figure 5: Initial view of the cover page

```
Sub UpdateAllFields()
    With ActiveDocument
        .PrintPreview
        .ClosePrintPreview
    End With
End Sub
```

Figure 6: Macro to update all of the fields in a document (from https://wordribbon.tips.net/T013475_Updating_Fields_Automatically.html)

* An even more elegant was is shown in https://wordribbon.tips.net/T013475_Updating_Fields_Automatically.html

```
Sub UpdateAllFields()
Application.ScreenUpdating = False
With ActiveDocument
  .Fields.Update
  .PrintPreview
  .ClosePrintPreview
End With
Application.ScreenUpdating = True
End Sub
```

Figure 7: An alternative macro document (from https://answers.microsoft.com/en-us/msoffice/forum/all/updating-all-fields-in-a-word-document/4462e35a-6284-4804-bd38-0514c852b616)

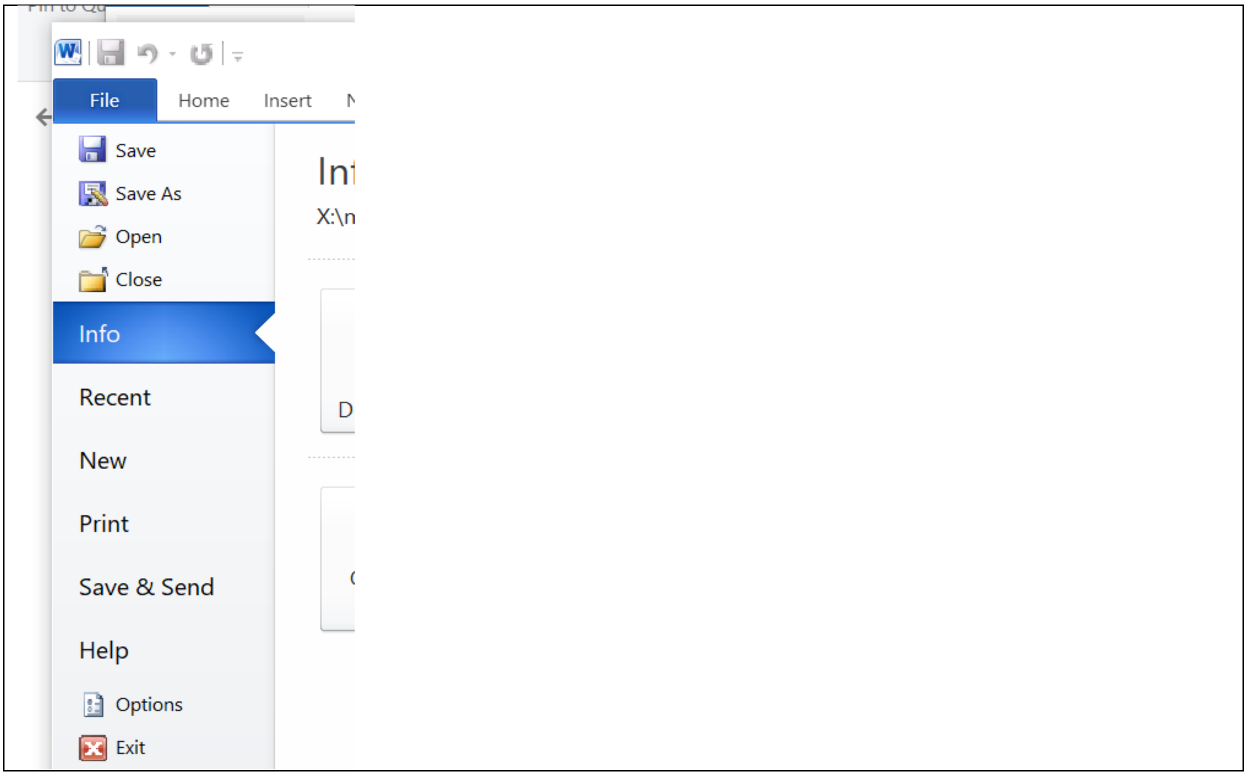
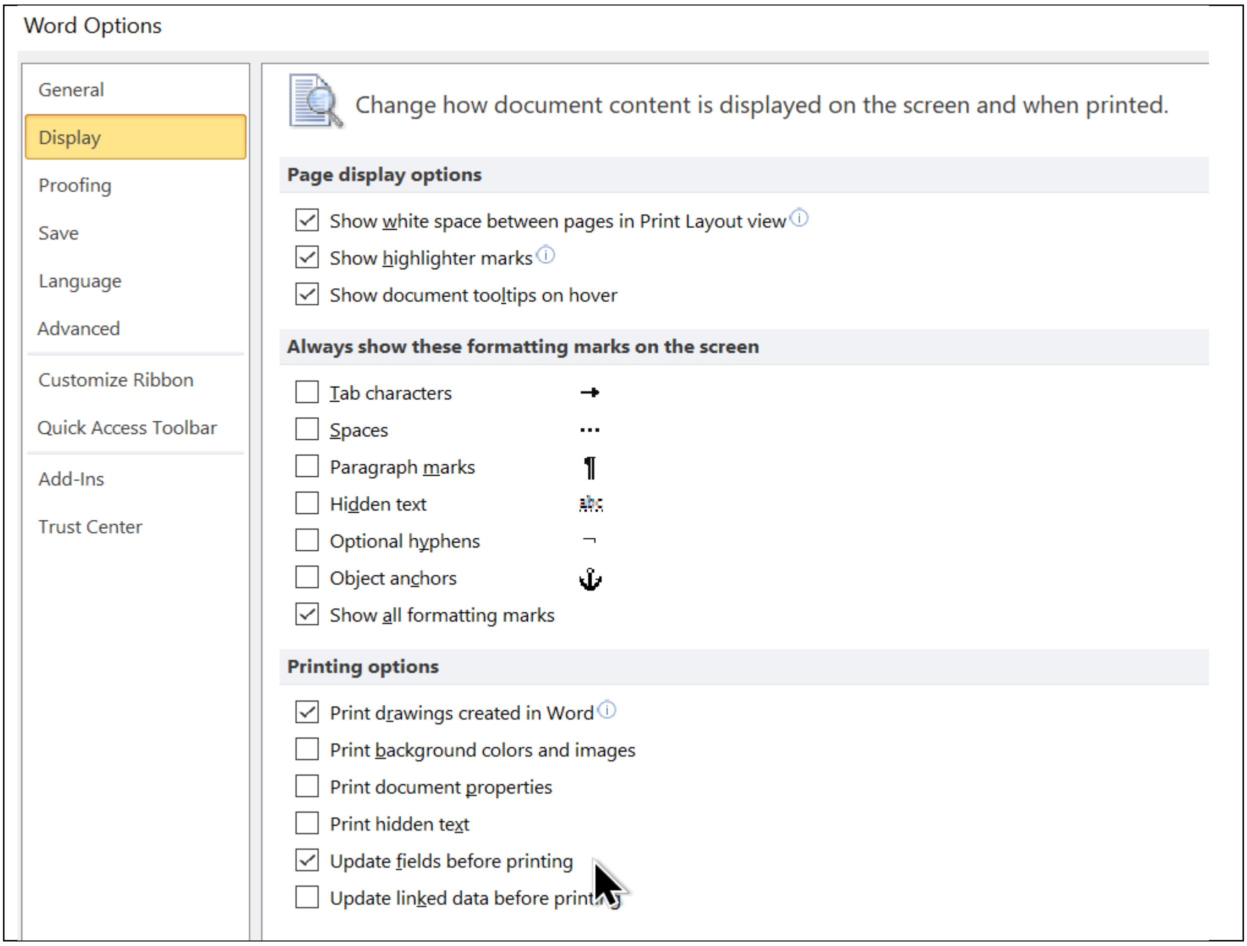


Figure 8: Setting the options via the File menu



Word Options

Change how document content is displayed on the screen and when printed.

Page display options

☑ Show white space between pages in Print Layout view
☑ Show highlighter marks
☑ Show document tooltips on hover

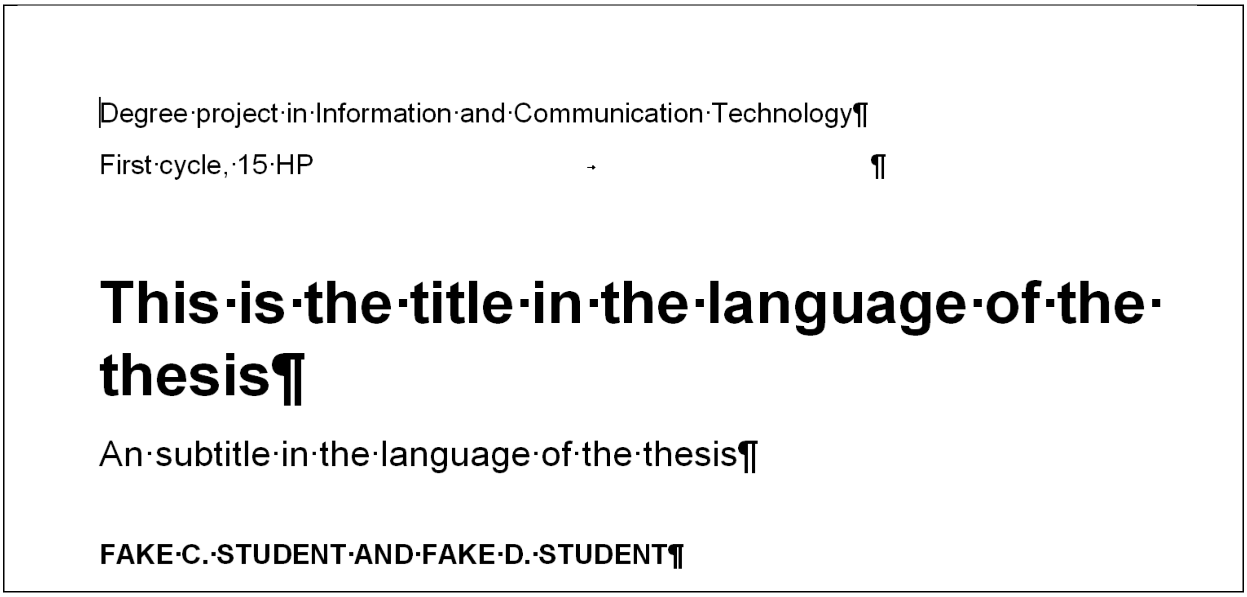
Always show these formatting marks on the screen

☐ Tab characters →
☐ Spaces ···
☐ Paragraph marks ¶
☐ Hidden text abc
☐ Optional hyphens ¬
☐ Object anchors ⚓
☑ Show all formatting marks

Printing options

☑ Print drawings created in Word
☐ Print background colors and images
☐ Print document properties
☐ Print hidden text
☑ Update fields before printing
☐ Update linked data before printing

Figure 9: Setting the options to update fields before printing



Degree·project·in·Information·and·Communication·Technology¶

First·cycle,·15·HP → ¶

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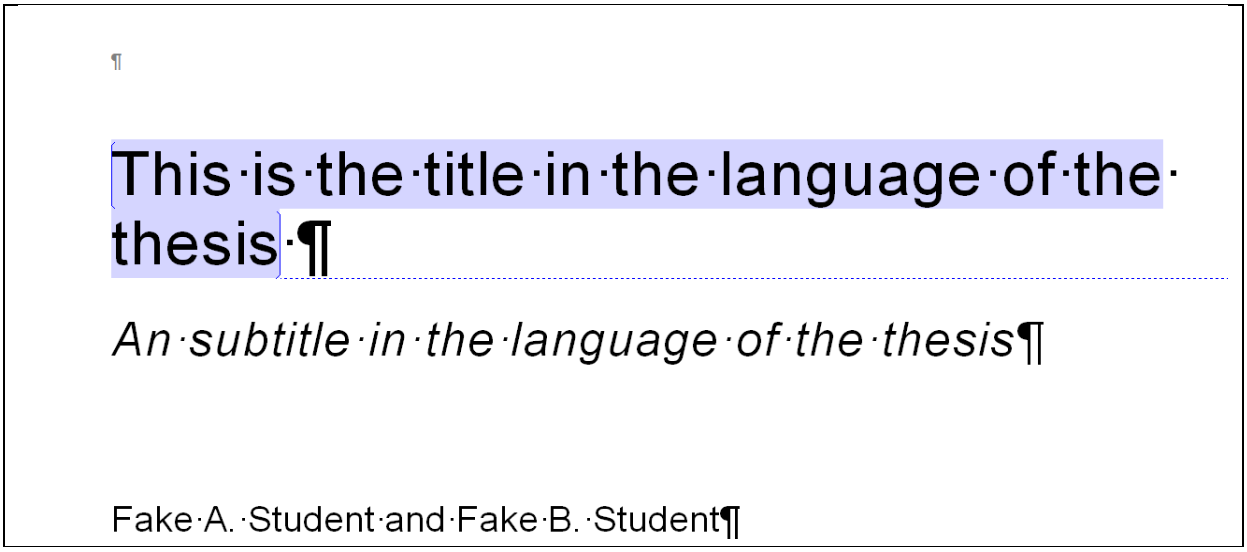
An·subtitle·in·the·language·of·the·thesis¶

FAKE·C.·STUDENT·AND·FAKE·D.·STUDENT¶

Figure 10: Resulting cover with the desired changes

Note that the same problem affects the title page as can be seen in the *before* printing picture in Figure 11 and the results *after* printing (Figure 12).



¶

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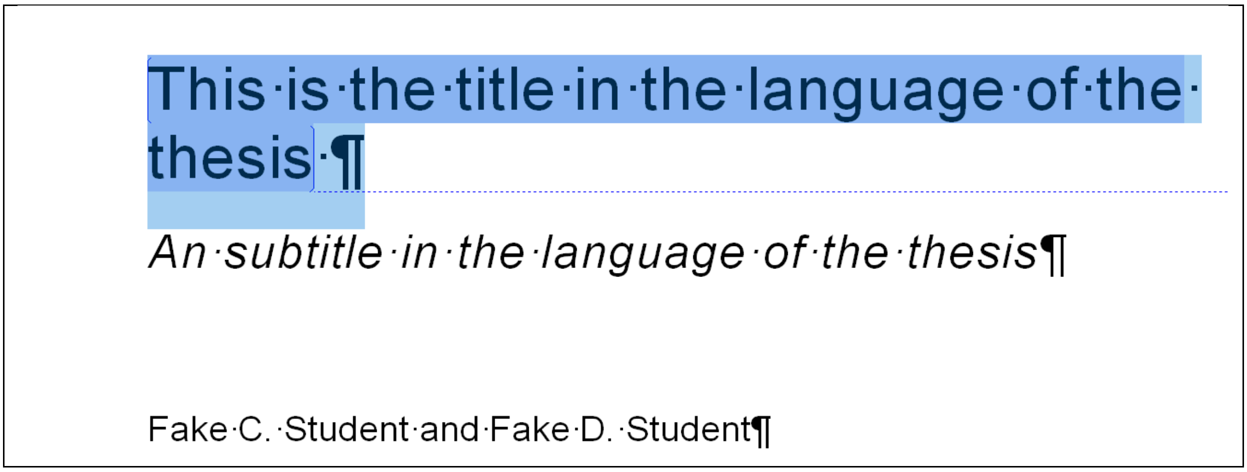
An·subtitle·in·the·language·of·the·thesis¶

Fake·A.·Student·and·Fake·B.·Student¶

Figure 11: Inside title page after making the changes but before printing



This·is·the·title·in·the·language·of·the·thesis·¶

An·subtitle·in·the·language·of·the·thesis¶

Fake·C.·Student·and·Fake·D.·Student¶

Figure 12: Inside title page after making the desired changes and triggering printing

5 Conclusions

While the feasibility of pre-configuring a DOCX file has been shown, it is less than smooth – since the user has to actively print the file to easily see the modified document. One possible way of hiding this complexity is to create the preconfigured file, programmatically do a print, and then use the resulting updated DOCX file as the preconfigured file to be used by the student.

While the examples in this document have used an integrated thesis with cover and thesis template, this approach of modifying custom DocProp could be applied to any document where there are custom DocProp values. Some examples, of alternative applications are customized forms, customized exams, customized written assignments.