# *Assignment #2* - Pythonic Converter Tool

**Due date:** 12nd April Sunday, 23:59

## Goal

In this assignment, you are asked to develop a tool to convert files among CSV, XML and JSON formats in Python. In addition, the tool must be able to validate your XML file via the corresponding XSD file.

## Implementation Details & Requirements

- The tool takes command line arguments according to the formats you want to convert between them. A typical command line usage is as follows:

  ```
  python <filename> <input file> <output file/xsd file> <type>
  ```

- The first argument, `<filename>` is the python file for conversion operations, `<input file>` refers to the source filename which will be converted and the third one, `<output file>`, refer to the target filename, or XSD file. The last argument, `<type>`, defines conversion type (1=CSV to XML, 2=XML to CSV, 3=XML to JSON, 4=JSON to XML, 5=CSV to JSON, 6=JSON to CSV,7=XML validates with XSD)

- The sample command line usage converting from XML to JSON as follows::

  ```
  python student_id.py test.xml test.json 3
  ```

- For XML operations, you should use `xml.etree.ElementTree` and for JSON operations you should use `json` library of python. XSD validation should be implemented using `etree` library under `lxml`. Any other libraries for file types other than these are not allowed.

- We give a sample CSV to test your program.

```
ÜNİVERSİTE_TÜRÜ;ÜNİVERSİTE;FAKÜLTE;PROGRAM_KODU;PROGRAM;DİL;ÖĞRENİM_TÜRÜ;BURS;ÖĞRENİM_SÜRESİ;PUAN_TÜRÜ;KONTENJAN;OKUL_BİRİNCİSİ_KONTE
NJANI;GEÇEN_YIL_MİN_SIRALAMA;GEÇEN_YIL_MİN_PUAN
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110442;Bilgisayar Mühendisliği;İngilizce;;;4;SAY;90;3;37000;425,12447
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110451;Çevre Mühendisliği;;;;4;SAY;80;2;232000;266,94283
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110469;Elektrik-Elektronik
Mühendisliği;İngilizce;;;4;SAY;90;3;41100;418,0695
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110478;Endüstri Mühendisliği;;;;4;SAY;90;3;50000;403,47177
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110487;İnşaat Mühendisliği;;;;4;SAY;90;3;62400;385,17519
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103130128;İnşaat Mühendisliği;;İkinci Öğretim;;4;SAY;90;3;86300;355,9879
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110496;Jeofizik Mühendisliği;;;;4;SAY;20;1;;
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110503;Jeoloji Mühendisliği;;;;4;SAY;30;1;;
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110512;Maden Mühendisliği;;;;4;SAY;60;2;;
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110521;Makine Mühendisliği;;;;4;SAY;90;3;55200;395,47115
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103130137;Makine Mühendisliği;;İkinci Öğretim;;4;SAY;90;3;75500;368,18479
Devlet;DOKUZ EYLÜL ÜNİVERSİTESİ;Mühendislik Fakültesi;103110539;Metalurji ve Malzeme Mühendisliği;;;;4;SAY;70;2;142000;309,13777
```

In this file, the separator character is semicolon (;). It has 14 columns and their details are given below:

| **Header Title** | **Header Description** |
|---|---|
| ÜNİVERSİTE_TÜRÜ | Displays the type of university and may have 2 values: "*Devlet*", "*Vakıf*" |
| ÜNİVERSİTE | Displays the name of university. |
| FAKÜLTE | Displays the name of faculty. |
| PROGRAM_KODU | Displays the department ID and has 9 digits. |
| PROGRAM | Displays the name of program. |
| DİL | Displays the language of department and may have 2 values: "*İngilizce*" *(en)* or *empty*. "*empty*" value means "*Türkçe*" (tr). |
| ÖĞRENİM_TÜRÜ | Displays the type of department and may have 2 values: "İkinci Öğretim" (*iö*) or *empty*. "*empty*" value means "*Örgün Öğretim*" (*öö*). |
| BURS | If the department gives scholarship, the field shows its percentage and may be these values: 25, 50, 100. It may be empty if it doesn't give. |
| ÖĞRENİM_SÜRESİ | Displays the education period of department and it must be numeric value. |
| PUAN_TÜRÜ | Displays the score type of department and may be 4 values: "*SAY*", "*EA*","*SÖZ*","*DİL*" |
| KONTENJAN | Displays the quota of department and it must be numeric value. |
| OKUL_BİRİNCİSİ_KONTENJANI | Displays the quota that students who graduate as the top of the school can prefer and it may be numeric value or empty (0). |
| GEÇEN_YIL_MİN_SIRALAMA | Displays the score of the person who has the minimum success ranking among those who preferred last year and it may be numeric value or empty (0). |
| GEÇEN_YIL_MİN_PUAN | Displays the score of the person who has the minimum score of those who preferred last year and and it must be decimal value or empty (0). |

- XSD file you will prepare for the sample CSV file should include all properties including restrictions.

- The general XML format should be as follows (JSON file will use the same structure):

```
<departments>
      <university name=”DOKUZ EYLÜL ÜNİVERSİTESİ” uType=”Devlet”>
            <item id=”103110442” faculty=”Mühendislik Fakültesi”>
                  <name lang=”en” second=”No”>Bilgisayar
Mühendisliği</name>
                  <period>4</period>
                  <quota spec=”3”>90</quota>
                  <field>SAY</field>
                  <last_min_score
order=”37000”>425,12447</last_min_score>
                  <grant/>
            </item>
            <item ...>
            …
            </item>
      </university>
</departments>
```

## Documentation

In this assignment, in line documentation is expected, as well as good coding practices such as consistent naming, proper usage of indentation and high readability of code.

## Submission

Submission will be via Github.

- Invitation link: https://classroom.github.com/a/v6N9dH71
- After accepting the invitation, your repository will be created automatically for this assignment. Then, you can commit the code into this repository.
- Name your source code file *xxx*.py, where *xxx* is your ***student id***. If you don’t follow the naming rules, a penalty applies. (10 pts)
- Late submission is accepted, but 10-points penalty applies for each day.

## Honesty

Your submissions will be scanned among each other as well as the Internet repository. Any assignments that are over the similarity threshold of a system for Detecting Software Similarity will get zero. We strongly encourage you not to submit your assignment rather than a dishonest submission.

## Grading policy

- Conversion Processes
  - CSV <-> XML 20%
  - CSV <-> JSON 20%
  - XML <-> JSON 20%
  - XSD validation 20%
- Documentation/coding style 20%

## For Questions

For any questions about the assignment please use Classroom systems comments under Assignment announcement. Before asking your question, please check carefully previous questions and answers, where similar questions were already asked by someone else already answered.

- No private questions via email will be answered!!!
- We will try to answer any of your questions as soon as possible, except the ones “Hocam my code does not work, can you fix it” or “I have implemented it but it does not work, can you look at it”. Debuggers are far more suitable options.

*Good luck!!!*

**Read all of the instructions carefully, if you find something UNCLEAR, please ask help to CLARIFY it!**