

# Pythonic Converter Tool

## 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_TURU;ÜNİVERSİTE;FAKÜLTE;PROGRAM_KODU;PROGRAM;DİL;ÖĞRENİM_TURU;BURS;ÖĞRENİM_SÜRESİ;PUAN_TURU;KONTENJAN;OKUL_BİRİNCİSİ_KONTE
NJANI;GEÇEN_YIL_MİN_SIRALAMA;GEÇEN_YIL_MİN_PUAN
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110442;Bilgisayar_Mühendisliği;İngilizce;;;4;SAY;90;3;37000;425,12447
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110451;Çevre_Mühendisliği;;;4;SAY;80;2;232000;266,94283
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110469;Elektrik-Elektronik
Mühendisliği;İngilizce;;;4;SAY;90;3;41100;418,0695
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110478;Endüstri_Mühendisliği;;;4;SAY;90;3;50000;403,47177
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110487;İnşaat_Mühendisliği;;;4;SAY;90;3;62400;385,17519
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103130128;İnşaat_Mühendisliği;İkinci_Öğretim;4;SAY;90;3;86300;355,9879
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110496;Jeofizik_Mühendisliği;;;4;SAY;20;1;;
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110503;Jeoloji_Mühendisliği;;;4;SAY;30;1;;
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110512;Maden_Mühendisliği;;;4;SAY;60;2;;
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103110521;Makine_Mühendisliği;;;4;SAY;90;3;55200;395,47115
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;103130137;Makine_Mühendisliği;İkinci_Öğretim;4;SAY;90;3;75500;368,18479
Devlet;DOKUZ_EYLÜL_ÜNİVERSİTESİ;Mühendislik_Fakultesi;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>

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