

# COMM108 Data Systems

## Week 1 Practical – Working with Data

### Introduction

In this week's lecture you learned how data is stored in computer systems. Two of the approaches covered in the lecture were JSON (JavaScript Object Notation), and XML (eXtensible Markup Language).

In this lab you will practice encoding data provided as a table format in JSON and XML formats and, given the importance of ensuring that the strict formatting requirements of each are respected, you will validate your data using online tools.

### Exercise 1

Your first task is to create a JSON file about some people. Create a new file in a text editor (not Microsoft Word...) and call it **people.json**. Within it, add (do not copy and paste – there may be invisible formatting characters in the PDF) the following text:

```
{
  "people": [
    {
      "name": "Alice Summers",
      "age": 28
    },
    {
      "name": "John Blake",
      "age": 35
    },
    {
      "name": "Maria Lopez",
      "age": 42
    }
  ]
}
```

You need to confirm that you've edited the JSON correctly, which you can do by copying the text into the JSON validator here: <https://jsonformatter.curiousconcept.com/#>.

### Exercise 2

You must now create XML data describing the same data. Open a new file and call it **people.xml**. Again, without copying and pasting, enter the following:

```
<people>
  <person>
    <name>Alice Summers</name>
    <age>28</age>
  </person>
  <person>
    <name>John Blake</name>
    <age>35</age>
  </person>
</people>
```

```
<person>
  <name>Maria Lopez</name>
  <age>42</age>
</person>
</people>
```

Validate the XML using the W3Schools XML validator:

[https://www.w3schools.com/xml/xml\\_validator.asp](https://www.w3schools.com/xml/xml_validator.asp).

### Exercise 3

Here is some sample data:

<i>Title</i>	<i>Author</i>	<i>ISBN</i>	<i>Publication date</i>	<i>Genre</i>	<i>Publisher</i>
<b>The Great Gatsby</b>	F. Scott Fitzgerald	978-0743273565	1925	Fiction, Drama	Scribner
1984	George Orwell	978-0451524935	1949	Dystopian, Political	Penguin
To Kill a Mockingbird	Harper Lee	978-0060935467	1960	Fiction, Legal Drama	Harper Perennial Modern
Brave New World	Aldous Huxley	978-0060850524	1932	Dystopian, Sci-Fi	Harper Perennial Modern
Animal Farm	George Orwell	978-0451526342	1945	Political Satire	Penguin
Pride and Prejudice	Jane Austen	978-0141439518	1813	Romance, Fiction	Penguin Classics

Your first task is to convert this data to JSON. Open a text editor and create a file called **books.json**. Using the example in Exercise 1 as a guide, create a JSON representation of the table.

**Hint:** you can use the following format to have a key map to a list of values:

```
"key": ["item_1", "item_2", ...]
```

Once you have done that, you should repeat the exercise to create XML. Begin a file called **books.xml** and create an XML representation of the table.

Validate **books.json** and **books.xml** in the same way as you did for Exercises 1 and 2.

### Exercise 4

Find a data set that interests you on the website of the UK's Office for National Statistics: <https://www.ons.gov.uk/>. Download the data and open it – explore the way in which data is represented. As a stretch activity, can you plot any of it?