**XML Basic**

**Introduction**

In this Pill we are going to explore the XML. In order to do that, initially we explain task distribution, then we explore the Theoretical concepts, and finally, we create an XML file to store data of a restaurant.

**Task distribution**

Since this pill is dealing with theoretical concepts, we need to design the tasks in order to read and comprehend the concept of XML. These tasks will lead us to answer the theoretical questions as well as do the practical part.

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| --- | --- | --- | --- |
| Task Name | Difficulty Level | Task Type | Time required |
| Read about XML | Easy | Theoretical | 2 hours |
| What is Markup Language | Medium | Theoretical | 2 hours |
| What is Metalingual | Medium | Theoretical | 2 hours |
| Differences between XML and JSON | Medium | Theoretical | 2 hours |
| Define five cases in which XML is used | Medium | Theoretical | 2 hours |
| What is the relationship between AJAX and XML? | Hard | Theoretical | 3 hours |
|  |  |  |  |
| Create XML Document for a Restaurant | Hard | Practical | 4 hours |

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**Theoretical Concepts**

In this section we are going to answer the few questions in the pill documentation.

1. **What is Markup Language**

Markup language refer to include some “*semantic syntactic”* in the text which guide reader to distinguish between normal information and “*annotated information”*. The main benefit of markup language refers to the fact that markup text is readable both for human and computer.

One of the universal known examples of Markup Language is HTML (Hypertext Markup Language) which can be easily read by human as well as search engines.

There is another type of markup language such as, Presentational markup, Procedural markup, and descriptive markup. The HTML, and XML are categorized under *descriptive markup* language. Descriptive markup language refers to the label or tags inside the text to create more description to the current passage.

1. **What is a metalanguage?**

Metalanguage is a language used to make statements regarding statements made in another language, known as an object language. Metalanguage helps in describing the concepts, grammar and objects associated with a particular programming language.

Metalanguage is a functional programming, and is mostly used to describe the grammar or any related terminology of the programming languages. There are different types of metalanguages such as ordered, nested and embedded metalanguages.

By getting familiar with Markup Language and Metalanguage, now is a time to ask:

**XML is a markup language or metalanguage?**

The answer is, XML, is metalanguage. Because, it is not a fixed format like HTML (which is a single, predefined markup language). Instead, XML is a metalanguage — a language for describing other languages — which lets you design your own markup languages for limitless different types of documents. XML can do this because it's written in SGML, the international standard metalanguage for text document markup (ISO 8879).

As it mentioned above A markup language is a set of words and symbols for describing the identity or function of the component parts of a document (for example ‘this is a paragraph’, ‘this is a heading’, ‘this is a list’, ‘this is the caption of this figure’, etc.). Programs can use markup with a stylesheet to transform the document into output for screen, print, audio, video, Braille, or reprocessable data formats.

XML is sometimes referred to as ‘self-describing’ because the names of the markup elements can represent the type of content they hold (e.g. title, chapter, link, etc.).

But XML is not just for Web pages: in fact, it's very rarely used on its own for Web pages because browsers still don't provide reliable support for formatting it. Common uses for XML include:

**Information identification**

You can define your own markup, so you can define meaningful names for all your information items.

**Information storage**

Because XML is portable and non-proprietary, it can be used to store information across any platforms. Because it is backed by an international standard, it will remain accessible and processable as a data format.

**Information structure**

XML structures can ‘nest’, so they can be used to store and identify any kind of hierarchical information, especially long, deep, or complex document sets or data sources, which makes it ideal for an information-management back-end to serving the Web. This is one if its most common Web applications, with a transformation system to serve it as HTML.

**Publishing**

The original goal of XML as defined in the quotation at the start of this section. Combining the three previous topics (identity, storage, and structure) means it is possible to get all the benefits of robust document management and control (with XML) and publish to the Web (as HTML) as well as to paper (as PDF) and to other formats (eg Braille, Audio, etc) from a single source document by using the appropriate stylesheets.

**Messaging and data transfer**

XML is also very heavily used for enclosing or encapsulating information in order to pass it between different computing systems which would otherwise be unable to communicate because of their proprietary or secret data formats. By providing a lingua franca for data identity and structure, XML provides a common ‘envelope’ for inter-process communication (messaging).

**Web services**

Building on all of these, as well as its use in browsers, machine-processable data can be exchanged between consenting systems, where before it was only comprehensible by humans (HTML). Weather services, e-commerce sites, blog newsfeeds, AJaX sites, and thousands of other data-exchange services like smartphone apps use XML for data management and transmission, and the web browser or app for display and interaction.

1. **Differences between XML and JSON**

JSON stands for JavaScript Object Notation. It’s an open-standard file format that is used for browser-server communications. It’s a language-independent data format. XML stands for Extensible Markup Language. It’s a set of rules that help the users to encode documents in a human-readable format and machine-readable.

In any case, if a project requires document markup and metadata information, it is better to use XML, otherwise for a more organized data interchange JSON could be your preferred choice.

XML is the default choice for data interchange because virtually every language has a parser for XML, Java, .net or any others. It is easy to fetch particular data from XML and there are schemas that can validate the XML. XML is used extensively in today’s ‘e’ world – banking services, online retail stores, integrating industrial systems, etc.

**The benefit of XML is listed below:**

Create interactive web pages, store and render content data to the user based on processing logic using the XSLT processor.

Gives provision to define metadata in a reusable and portable format.

More accurate web search results because data is stored inside tags.

Makes information exchanges like b2b transactions and b2c transactions easy and more accessible.

Several web tasks can be automated making them efficient.

**Benefit of JSON are:**

A better option for XML for data transfers, JSON definitely requires less coding and has a smaller size, making it faster to process and transmit data. Moreover, though it is written in JavaScript, it is language-independent. But, that’s all JSON can do. It doesn’t have any of the powerful validation and schema related features that XML has.

Moreover, With the popularity of REST APIs over SOAP/WSDL model, JSON gained momentum in the programming of API code and web services. It is text-based, light-weight and has an easy to parse data format requiring no additional code for parsing. JSON thus helps in faster data interchange and web service results. So, for web services, that need to just return a lot of data and display the same, the ideal choice is JSON!

JSON do not need tags, instead it uses key-value pair for identify data.

JSON is shorter than XML.

JSON is quicker to read and write.

JSON can use Array while XML cannot.

1. **Define five cases in which XML is used**
2. XML is often used for distributing data over the world wide web.
3. Is used when you want to separate data from presentation.
4. XML semantically store data, in the case that you need to know what kind of data you are storing, XML is very helpful. Because understanding of XML is easy for human.
5. If the data is added to your XML file, XML can handle it very smoothly.
6. XML is easier to expand and upgrade to new operating system, new application, or new browser, without losing any data.
7. **What is the relationship between AJAX and XML?**