Information Technology Year 2 – Period 2

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Data Processing

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**Introduction**

To create a REST API, I used the “world” database provided by <https://dev.mysql.com/> and the API was created using PHP language and for visualization part I used C# Windows Form Application.

**API**

* 1. **File structure**

├─ api/  
├─── config/  
├────── database.php - connecting to the database.  
├─── objects/  
├────── city.php – queries for city object. ├────── country.php - – queries for country object. ├────── language.php - – queries for language object.  
├─── city/   
├──────.htaccess – rewrites the URLs. ├──────create.php - accepts posted city data to be saved to db.   
├──────delete.php - accepts a city ID to delete a db record.  
├──────read.php - outputs JSON/XML data based from "cities" db records.  
├──────update.php - accepts a city ID to update a db record.  
├──────cities\_schema.xsd - schema for XML file ├──────cities\_schema.json – schema for JSON file.  
├─── country/ ├──────.htaccess – rewrites the URLs.   
├──────create.php - accepts posted country data to be saved to db.  
├──────delete.php - accepts a country Code to delete a db record.  
├──────read.php - outputs JSON/XML data based from "countries" db records.  
├──────update.php - accepts a country Code to update a db record.  
├──────countries\_schema.xsd - schema for XML file ├────── countries\_schema.json – schema for JSON file.  
├─── language/ ├──────.htaccess – rewrites the URLs.   
├──────create.php - accepts posted language data to be saved to db.  
├──────delete.php - accepts a language Name to delete a db record.  
├──────read.php - outputs JSON/XML data based from " languages" db records.  
├──────update.php - accepts a language Name to update a db record.  
├────── languages\_schema.xsd - schema for XML file ├────── languages\_schema.json – schema for JSON file.

**2.1 Programming**

database.php has class ‘Database’ that gets a database connection using mysqli in folder ‘config’.

The city object extends class ‘Database’ to get a database connection. It has methods to do CRUD operations. The same with country and language objects.

Folder(city/country/language) has file read.php that gets an array of data from its corresponding object to return either JSON or XML depending on user’s choice. update.php/create.php/update.php do operations depending on its functionality (POST, PUT, DELETE).

The file .htaccess rewrites the URLs for read.php to get either JSON or XML format. For example: to get one specific city in XML format from database we will use (read.php/Kabul/xml) instead of (read.php?Name=Kabul&type=xml), but to get all the cities we will use read.php?type=xml (Same for JSON format). It also rewrites the URL for delete.php to delete the record in the database. For example: to delete the city by ID, we will use delete.php/12 instead of delete.php?ID=12 (Same for every object).

**3.1 Visualization (C#)**

Firstly, I had to design the Windows form, creating the tab control with general information of chosen city and charts. One chart is used to compare population between two cities and the second chart is used to show the percentage of each language in chosen city.

Secondly, I had to import all namespaces:

using Newtonsoft.Json.Linq;

using System;

using System.Linq;

using System.Windows.Forms;

using System.Xml;

using System.Xml.Linq;

using System.Xml.Schema;

using Newtonsoft.Json.Schema;

using System.Collections;

using Newtonsoft.Json;

using System.IO;

The code has two functions that consumes an API both using WebClient package for JSON and XDocument object to parse XML file. The function collectData() grabs all the data of chosen city. The function cityToCompare() grabs the population of the second city. I also implemented the function that validates the JSON and XML files.

**4.2 Why did I choose those programming languages?**

The reason I created a C# Application is because I wanted to be able to realize the full potential of an API by consuming it by a Non-Web-Based Application. Below are several features given that describes the importance of PHP in web development: performance, compatibility (This language works seamlessly with the major operating system, database, and web servers.), flexibility (It enables the programmers for making changes to the code during different stages of development. You can easily add new features or functionality to the website even after writing the code), scalability (The programmers have the options for creating small and simple websites by embedding PHP code into HTML), Open Source. On the consumer side it is easy to use Windows Form creator, either way I would not recommend to use C# as it takes a lot of time to code and make it work.