# Performance Report

*Research and determine the most appropriate code optimisers and performance tools that could be beneficial for the project, create a Performance Report for submission with the Software Development Master Document at the Sprint Two milestone.*

## HTML

Website creation tools such as WordPress, Joomla, Drupal, etc which can be used to create websites without having to know much about HTML and CSS. Good HTML coding practise can help reduce the file size ad decrease page load time. There are multiple general rules, guide lines and HTML templates which can help to do this such as:

* Using strict Document Type Definition (DTD) to enable standard mode for maximum rendering speed.
* Reducing or minimizing HTTP requests by converting graphic text to text and consolidating.
* Removing whitespace within your code (spaces, tabs, returns, comments etc).
* Removing old or unneeded code.
* Commenting within your code to help easier identify what it is doing.

There are multiple HTML code optimisers and performance tools which can help you achieve good HTML coding practises, file configurations and even creating a website from start to finish.

### Dr. Watson

[Dr. Wastion](http://watson.addy.com/) is an error debugger that gather information within a program or via a URL. It has multiple options which the user can select from to vary the type of debugging or verification it does.

### Web Page Analyzer

[Web Page Analyzer](http://www.websiteoptimization.com/services/analyze/) can be used to calculate the page size, composition, download time, size of individual elements and then sums up each type of web page component. It can also provide information and advice on how to improve/optimise the page load time.

### WordPress

[WordPress](https://wordpress.com/) is a Content Management System (CMS) which can be used to create a websites with little to none coding knowledge as it provides graphical user interfaces (GUI) templates and options which manipulate the HTML itself without the user having to know the code. WordPress is based on PHP and MySQL and is one of the most popular CMS tools.

### Joomla

[Joomla](https://www.joomla.org/) is a free and open-source Content Management System (CMS) which can be used to create a websites with little to none coding knowledge as it provides graphical user interfaces (GUI) templates, options and plug-ins which manipulate the HTML itself without the user having to know the code.

## CSS

Good CSS coding practises can help reduce the file size and decrease page load time. There are multiple general rules and guide lines which help to do this when writing CSS such as:

* Using image sprites to package images into on large .png file reducing HTTP requests and improving page load time
* Minifying CSS which is to remove as much of the white space within a CSS file.
* Reducing unnecessary code such as old code, code which applies the same style but is written twice.
* Splitting CSS files can be done if multiple browsers are supported eg IE, Chrome or Firefox, this allows for only the required CSS code to be loaded and ran.
* Commenting within your code to help easier identify what it is doing.

There are multiple CCS code optimisers and performance tools which can help you achieve good CSS coding practises and file configurations.

### CSS LINT

[CSS LINT](http://csslint.net/) is an open source CSS code quality tool released in June 2011 which can be used to point out problems within your CSS Code by doing basic syntax checking as well as applying a set of rules to the code which look for problematic patterns or signs of inefficiency.

### Code Beautifier

[Code Beautifer](http://www.codebeautifier.com/) is a CSS optimisation tool which can be used to clean the chosen CSS file. It has multiple options which the user can select from and allows you to insert your CSS code via a link or direct upload.

### W3C CSS Validator

[W3C CSS Validator](http://jigsaw.w3.org/css-validator/#validate_by_uri+with_options) can be used to validate your CSS code against the W3C CSS specs. It can help validate a CSS file against specific devices such as handheld or desktop, printing, projection, etc.

## PHP

PHP performance should not just rely on how quickly it’s code can perform but also should take into account the accuracy and scalability of the code or action being performed. There are multiple general rules, guide lines and supported features which can be used to help optimise your PHP such as:

* Using native PHP functions can save you from having to write a function yourself.
* PHP also has native functions which support the use of JSON which are quiet fast, which is why JSON is preferable to using XML.
* Using Caching techniques.
* Closing database connections can save memory consumption.

There are multiple PHP code optimisers, performance tools and profilers which can help you achieve fast, reliable and easy to read PHP code, coding practises and file configurations.

### Xdebug’s Profiler

[Xdebug’s Profiler](http://xdebug.org/docs/profiler) can be used to analyse your PHP code to find bottlenecks and see which parts of your code are slow and could be improved. It can also provide information about how much memory is being used and which functions and methods increased memory usage.

### Retrace

[Retrace](https://stackify.com/retrace/) is an application performance management (APM) tool which can help track how a web application behave in specific or certain scenarios. It is mainly used to track the performance of database queries and application program interface (API) calls. This can help developers understand and find bottlenecks.

### PHP Code Beautifier

[PHP Code Beautifier](https://www.tools4noobs.com/online_tools/beautify_php/) can be used to format PHP code so it can be viewed nicely.

## SQL

SQL Database need to be constantly tuned, optimised and reviewed as they can hold significant amounts of data. As the database grows larger the longer queries and statements till take to execute. There are multiple general rules, guide lines and supported features which can be used to help optimise your SQL Database such as:

* Avoid using functions in predicates
* Avoid using wildcard (%) in the beginning of a predicate
* Avoid unnecessary columns in SELECT clause
* Use inner join, instead of outer join if possible
* Use DISTINCT and UNION only if it is necessary
* The ORDER BY clause is mandatory in SQL if you expect to get a sorted result

### Database Performance Analyzer

### [Database Performance Analyzer](https://www.solarwinds.com/database-performance-analyzer) can be used for multiple types of analysis including Intuitive performance analysis, Blocking analysis, Database, index, and query tuning advisors and more.

### Redgate SQL Monitor

[Redgate SQL Monitor](https://www.red-gate.com/products/dba/sql-monitor/) can be used for multiple type of analysis and can produce reports which can help identify area for improvement or areas which are experience issues.

### Idera DB Optimizer

[Idera DB Optimizer](https://www.idera.com/dboptimizer-sql-database-optimization) offer multiple ways to help optimise a database such as streamline tuning of SQL code on major DBMSs from one interface, tuning SQL with automated performance optimization suggestions, visual SQL tuning diagrams and database profiling of wait-time analysis and load test alternative SQL queries in simulated production environment.