# CS 305 Project One Template

## Document Revision History

| **Version** | **Date** | **Author** | **Comments** |
| --- | --- | --- | --- |
| **1.0** | **11/15/2024** | **Dan Haythorn** |  |

## Client



## Instructions

Submit this completed vulnerability assessment report. Replace the bracketed text with the relevant information. In this report, identify your security vulnerability findings and recommend the next steps to remedy the issues you have found.

* Respond to the five steps outlined below and include your findings.
* Respond using your own words. You may also include images or supporting materials. If you include them, make certain to insert them in the relevant locations in the document.
* Refer to the Project One Guidelines and Rubric for more detailed instructions about each section of the template.

## Developer

Dan Haythorn

**1. Interpreting Client Needs**

Determine your client’s needs and potential threats and attacks associated with the company’s application and software security requirements. Consider the following questions regarding how companies protect against external threats based on the scenario information:

* What is the value of secure communications to the company?
* Are there any international transactions that the company produces?
* Are there governmental restrictions on secure communications to consider?
* What external threats might be present now and in the immediate future?
* What modernization requirements must be considered, such as the role of open-source libraries and evolving web application technologies?

The company values security because they want to update their security framework to modern standards. It wants to do this as part of an overall modernization effort that the company is undertaking, which means that the software will be more web based and therefore more prone to security issues. They don’t say specifically if they’re going to deal with international customers but it’s safe to assume they will. There are data protection and privacy laws out there that developers may need to consider. In most cases, a company can share and trade your data without having to notify you at all. This is good for the software company but maybe not so great for the customer.

**2. Areas of Security**

Refer to the vulnerability assessment process flow diagram. Identify which areas of security apply to Artemis Financial’s software application. Justify your reasoning for why each area is relevant to the software application.

Since the company wants to upgrade to an online web-based RESTful application, a number of new security threats could appear. Four areas stand out to me in particular: input validation, APIs, Cryptography, and Client/Server. Input validation because the application will be taking a lot more input from more insecure sources. Web apps will utilize a whole new set of APIs which will all bring potential vulnerabilities. It is a fundamentally client/server setup and in this web based world cryptography will be used a lot to protect data and communications.

**3. Manual Review**

Continue working through the vulnerability assessment process flow diagram. Identify all vulnerabilities in the code base by manually inspecting the code.

- Project is missing any kind of input validation

- There are unimplemented methods in the myDateTime class

- error information might be in HTTP responses by default

- no HTTPS

- /greeting could cause unwanted access to data

- error handling could expose data

- no rate limiting

**4. Static Testing**

Run a dependency check on Artemis Financial’s software application to identify all security vulnerabilities in the code. Record the output from the dependency-check report. Include the following items:

* The names or vulnerability codes of the known vulnerabilities
* A brief description and recommended solutions provided by the dependency-check report
* Any attribution that documents how this vulnerability has been identified or documented previously

**Project: rest-service**

**com.twk:rest-service:0.0.1-SNAPSHOT**

Scan Information ([show all](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html)):

* *dependency-check version*: 5.3.0
* *Report Generated On*: Wed, 13 Nov 2024 15:05:04 -0500
* *Dependencies Scanned*: 38 (24 unique)
* *Vulnerable Dependencies*: 13
* *Vulnerabilities Found*: 90
* *Vulnerabilities Suppressed*: 0
* ...

## Summary

* Display: [Showing Vulnerable Dependencies (click to show all)](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html)

| **Dependency** | **Vulnerability IDs** | **Package** | **Highest Severity** | **CVE Count** | **Confidence** | **Evidence Count** |
| --- | --- | --- | --- | --- | --- | --- |
| [bcprov-jdk15on-1.46.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l2_991c96a4e31e6c19e2b9136c8955bd423f2dc4c7) | [cpe:2.3:a:bouncycastle:legion-of-the-bouncy-castle-java-crytography-api:1.46:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Abouncycastle&cpe_product=cpe%3A%2F%3Abouncycastle%3Alegion-of-the-bouncy-castle-java-crytography-api&cpe_version=cpe%3A%2F%3Abouncycastle%3Alegion-of-the-bouncy-castle-java-crytography-api%3A1.46) | [pkg:maven/org.bouncycastle/bcprov-jdk15on@1.46](https://ossindex.sonatype.org/component/pkg:maven/org.bouncycastle/bcprov-jdk15on@1.46?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | HIGH | 20 | Highest | 37 |
| [spring-boot-2.2.4.RELEASE.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l3_225a4fd31156c254e3bb92adb42ee8c6de812714) | [cpe:2.3:a:vmware:spring\_boot:2.2.4:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Avmware&cpe_product=cpe%3A%2F%3Avmware%3Aspring_boot&cpe_version=cpe%3A%2F%3Avmware%3Aspring_boot%3A2.2.4) | [pkg:maven/org.springframework.boot/spring-boot@2.2.4.RELEASE](https://ossindex.sonatype.org/component/pkg:maven/org.springframework.boot/spring-boot@2.2.4.RELEASE?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | CRITICAL | 3 | Highest | 32 |
| [logback-core-1.2.3.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l4_864344400c3d4d92dfeb0a305dc87d953677c03c) | [cpe:2.3:a:qos:logback:1.2.3:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aqos&cpe_product=cpe%3A%2F%3Aqos%3Alogback&cpe_version=cpe%3A%2F%3Aqos%3Alogback%3A1.2.3) | [pkg:maven/ch.qos.logback/logback-core@1.2.3](https://ossindex.sonatype.org/component/pkg:maven/ch.qos.logback/logback-core@1.2.3?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | HIGH | 2 | Highest | 32 |
| [log4j-api-2.12.1.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l5_a55e6d987f50a515c9260b0451b4fa217dc539cb) | [cpe:2.3:a:apache:log4j:2.12.1:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aapache&cpe_product=cpe%3A%2F%3Aapache%3Alog4j&cpe_version=cpe%3A%2F%3Aapache%3Alog4j%3A2.12.1) | [pkg:maven/org.apache.logging.log4j/log4j-api@2.12.1](https://ossindex.sonatype.org/component/pkg:maven/org.apache.logging.log4j/log4j-api@2.12.1?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | CRITICAL | 5 | Highest | 46 |
| [snakeyaml-1.25.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l8_8b6e01ef661d8378ae6dd7b511a7f2a33fae1421) | [cpe:2.3:a:snakeyaml\_project:snakeyaml:1.25:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Asnakeyaml_project&cpe_product=cpe%3A%2F%3Asnakeyaml_project%3Asnakeyaml&cpe_version=cpe%3A%2F%3Asnakeyaml_project%3Asnakeyaml%3A1.25) [cpe:2.3:a:yaml\_project:yaml:1.25:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Ayaml_project&cpe_product=cpe%3A%2F%3Ayaml_project%3Ayaml&cpe_version=cpe%3A%2F%3Ayaml_project%3Ayaml%3A1.25) | [pkg:maven/org.yaml/snakeyaml@1.25](https://ossindex.sonatype.org/component/pkg:maven/org.yaml/snakeyaml@1.25?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | CRITICAL | 10 | Highest | 28 |
| [jackson-databind-2.10.2.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l9_0528de95f198afafbcfb0c09d2e43b6e0ea663ec) | [cpe:2.3:a:fasterxml:jackson-databind:2.10.2:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Afasterxml&cpe_product=cpe%3A%2F%3Afasterxml%3Ajackson-databind&cpe_version=cpe%3A%2F%3Afasterxml%3Ajackson-databind%3A2.10.2) | [pkg:maven/com.fasterxml.jackson.core/jackson-databind@2.10.2](https://ossindex.sonatype.org/component/pkg:maven/com.fasterxml.jackson.core/jackson-databind@2.10.2?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | HIGH | 6 | Highest | 39 |
| [tomcat-embed-core-9.0.30.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l13_ad32909314fe2ba02cec036434c0addd19bcc580) | [cpe:2.3:a:apache:tomcat:9.0.30:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aapache&cpe_product=cpe%3A%2F%3Aapache%3Atomcat&cpe_version=cpe%3A%2F%3Aapache%3Atomcat%3A9.0.30) [cpe:2.3:a:apache\_tomcat:apache\_tomcat:9.0.30:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aapache_tomcat&cpe_product=cpe%3A%2F%3Aapache_tomcat%3Aapache_tomcat&cpe_version=cpe%3A%2F%3Aapache_tomcat%3Aapache_tomcat%3A9.0.30) | [pkg:maven/org.apache.tomcat.embed/tomcat-embed-core@9.0.30](https://ossindex.sonatype.org/component/pkg:maven/org.apache.tomcat.embed/tomcat-embed-core@9.0.30?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | CRITICAL | 27 | Highest | 39 |
| [hibernate-validator-6.0.18.Final.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l16_7fd00bcd87e14b6ba66279282ef15efa30dd2492) | [cpe:2.3:a:redhat:hibernate\_validator:6.0.18:\*:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aredhat&cpe_product=cpe%3A%2F%3Aredhat%3Ahibernate_validator&cpe_version=cpe%3A%2F%3Aredhat%3Ahibernate_validator%3A6.0.18) | [pkg:maven/org.hibernate.validator/hibernate-validator@6.0.18.Final](https://ossindex.sonatype.org/component/pkg:maven/org.hibernate.validator/hibernate-validator@6.0.18.Final?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | MEDIUM | 2 | Highest | 36 |
| [spring-web-5.2.3.RELEASE.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l19_dd386a02e40b915ab400a3bf9f586d2dc4c0852c) | [cpe:2.3:a:pivotal\_software:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Apivotal_software&cpe_product=cpe%3A%2F%3Apivotal_software%3Aspring_framework&cpe_version=cpe%3A%2F%3Apivotal_software%3Aspring_framework%3A5.2.3) [cpe:2.3:a:springsource:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aspringsource&cpe_product=cpe%3A%2F%3Aspringsource%3Aspring_framework&cpe_version=cpe%3A%2F%3Aspringsource%3Aspring_framework%3A5.2.3) | [pkg:maven/org.springframework/spring-web@5.2.3.RELEASE](https://ossindex.sonatype.org/component/pkg:maven/org.springframework/spring-web@5.2.3.RELEASE?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | HIGH | 7 | Highest | 28 |
| [spring-beans-5.2.3.RELEASE.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l20_0250c8c641433dc06b1b44e4563fa08a2fbf8954) | [cpe:2.3:a:pivotal\_software:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Apivotal_software&cpe_product=cpe%3A%2F%3Apivotal_software%3Aspring_framework&cpe_version=cpe%3A%2F%3Apivotal_software%3Aspring_framework%3A5.2.3) [cpe:2.3:a:springsource:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aspringsource&cpe_product=cpe%3A%2F%3Aspringsource%3Aspring_framework&cpe_version=cpe%3A%2F%3Aspringsource%3Aspring_framework%3A5.2.3) | [pkg:maven/org.springframework/spring-beans@5.2.3.RELEASE](https://ossindex.sonatype.org/component/pkg:maven/org.springframework/spring-beans@5.2.3.RELEASE?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | HIGH | 1 | Highest | 28 |
| [spring-webmvc-5.2.3.RELEASE.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l21_745a62502023d2496b565b7fe102bb1ee229d6b7) | [cpe:2.3:a:pivotal\_software:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Apivotal_software&cpe_product=cpe%3A%2F%3Apivotal_software%3Aspring_framework&cpe_version=cpe%3A%2F%3Apivotal_software%3Aspring_framework%3A5.2.3) [cpe:2.3:a:springsource:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aspringsource&cpe_product=cpe%3A%2F%3Aspringsource%3Aspring_framework&cpe_version=cpe%3A%2F%3Aspringsource%3Aspring_framework%3A5.2.3) | [pkg:maven/org.springframework/spring-webmvc@5.2.3.RELEASE](https://ossindex.sonatype.org/component/pkg:maven/org.springframework/spring-webmvc@5.2.3.RELEASE?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | HIGH | 2 | Highest | 30 |
| [spring-context-5.2.3.RELEASE.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l22_7750c95c96c7a1885c8b1b503ba915bc33ca579a) | [cpe:2.3:a:pivotal\_software:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Apivotal_software&cpe_product=cpe%3A%2F%3Apivotal_software%3Aspring_framework&cpe_version=cpe%3A%2F%3Apivotal_software%3Aspring_framework%3A5.2.3) [cpe:2.3:a:springsource:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aspringsource&cpe_product=cpe%3A%2F%3Aspringsource%3Aspring_framework&cpe_version=cpe%3A%2F%3Aspringsource%3Aspring_framework%3A5.2.3) | [pkg:maven/org.springframework/spring-context@5.2.3.RELEASE](https://ossindex.sonatype.org/component/pkg:maven/org.springframework/spring-context@5.2.3.RELEASE?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | MEDIUM | 1 | Highest | 28 |
| [spring-expression-5.2.3.RELEASE.jar](file:///C:\Users\DanDesktop\eclipse-workspace\rest-service\target\dependency-check-report.html#l23_d0c6bb10758805b2153c589686b8045554bfac2d) | [cpe:2.3:a:pivotal\_software:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Apivotal_software&cpe_product=cpe%3A%2F%3Apivotal_software%3Aspring_framework&cpe_version=cpe%3A%2F%3Apivotal_software%3Aspring_framework%3A5.2.3) [cpe:2.3:a:springsource:spring\_framework:5.2.3:release:\*:\*:\*:\*:\*:\*](https://nvd.nist.gov/vuln/search/results?form_type=Advanced&results_type=overview&search_type=all&cpe_vendor=cpe%3A%2F%3Aspringsource&cpe_product=cpe%3A%2F%3Aspringsource%3Aspring_framework&cpe_version=cpe%3A%2F%3Aspringsource%3Aspring_framework%3A5.2.3) | [pkg:maven/org.springframework/spring-expression@5.2.3.RELEASE](https://ossindex.sonatype.org/component/pkg:maven/org.springframework/spring-expression@5.2.3.RELEASE?utm_source=dependency-check&utm_medium=integration&utm_content=5.3.0) | MEDIUM | 4 | Highest | 30 |

**The following is list of dependencies that had vulnerabilities that were published in the report.**

**bcprov-jdk15on-1.46.jar**

**spring-boot-2.2.4.RELEASE.jar**

**logback-core-1.2.3.jar**

**log4j-api-2.12.1.jar**

**snakeyaml-1.25.jar**

**jackson-databind-2.10.2.jar**

**tomcat-embed-core-9.0.30.jar**

**hibernate-validator-6.0.18.Final.jar**

**spring-web-5.2.3.RELEASE.jar**

**spring-beans-5.2.3.RELEASE.jar**

**spring-webmvc-5.2.3.RELEASE.jar**

**spring-context-5.2.3.RELEASE.jar**

**spring-expression-5.2.3.RELEASE.jar**

**5. Mitigation Plan**

Interpret the results from the manual review and static testing report. Then identify the steps to mitigate the identified security vulnerabilities for Artemis Financial’s software application.

To mitigate the issues found in the reports the team should implement more proactive testing procedures. Using the dependency checking tool and finding errors and following the tools advice for fixing those problems is a good starting point. Also, taking the developers advice in their code reviews and implementing their changes would help as well.

**Sources:**

<https://www.nytimes.com/wirecutter/blog/state-of-privacy-laws-in-us/>

https://www.oracle.com/java/technologies/javase/seccodeguide.html