Requirements Specification Document

TempConvApp

Temperature Conversion Applet Program

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1 Scope

1.1 Identification

This Software Requirements Specification (SRS) documents the requirements for the Temperature Conversion Applet program, called **TempConvApp**.

1.2 System Overview

The TempConvApp program is based on a Java-enabled web page, consisting of text instructions and a Java applet which will be displayed. This solution provides platform independence.

The applet consists of five labeled entry fields into which temperature values may be typed. Conversions between temperatures are performed when the user presses the "enter" key on the keyboard. Empty and/or non-numeric values are considered as set to a value of zero, and all other fields are updated appropriately with the values calculated from that assumed zero value.

In addition, there is a labeled button to allow the user to clear all the fields at once, and a labeled button to bring up a secondary help and information web page.

1.3 Document Overview

This document is organized as follows. Section 2 presents tables containing pertinent related documents that apply to this program. Section 3 contains a more in-depth description of the system operation. Section 4 provides details of computing, compiling, development, CM tools, and other supporting resources required. Section 5 presents the distribution and maintenance information. Section 6 contains a Verification Cross Reference Index (VCRI) table for tracking requirements verification tracking. Section 7 provides a Validation Cross Reference Matrix (VCRM) table, containing requirements verification information. Finally, section 8 contains appendices and assorted miscellaneous information.

The following table defines the language used in specifying requirements in this document. There are three levels of specification, only one of which constitutes and indicates an actual contractual, verifiable requirement.

Table 1- Document Definitions

Type	Definition
Shall	Expresses a mandatory provision. Any deviations from these contractually imposed mandatory requirements require the approval of the John Q. Public Software REA.
Should	Expresses non-mandatory provision. Unless required by other contract provisions, noncompliance with this requirement does not require John Q. Public Software REA approval and does not require documented technical substantiation.
Will	Declaration of purpose such as a design goal. Unless required by other contract provisions, noncompliance with this requirement does not require John Q. Public Software REA approval and does not require documented technical substantiation.

2 Applicable Documents

The tables in the following subsections contain documents, the latest revisions of which are considered to be part of this specification by their inclusion.

2.1 John Q. Public Software Documents

Table 2- Solution Provider Documents

Document Number	Document Title	Date/Revision
TP86007-H96-123	Software Development Plan Document	07-Aug-1999
TP86007-H96-101	Software Configuration Management Plan Document	04-Jan-2003
VD86007-H23-001	Software Version Description Document	05-Jun-2000
ST86007-H44-002	Software Test and Integration Plan Document	Rev B 06-Jul-1998

2.2 Embraceable Pickle Corporation Documents

Table 3- Customer-provided Documents

Document Number	Document Title	Date/Revision
None		

2.3 Industry Standard Documents

Table 4- Applicable Industry Standard Documents

Document Number	Document Title	Date/Revision
None		

2.4 Government Documents

Table 5- Government Documents

Document Number	Document Title	Date/Revision
None		

3 System Operation and Requirements

3.1 Subsystem Divisions

The Temperature Conversion Applet, TempConvApp, is divided into two main subsystems, or sections. The first section, called the Web Page Subsystem, is the portion which controls the display of the applet, and consists of two web pages. The second section, known as the Java Applet Subsystem, is the subsystem which consists of the applet operation.

3.2 Web Page Subsystem

The following requirements are levied on the Web Page Subsystem of the TempConvApp project.

3.2.1 The subsystem shall be displayed in a web page

3.2.2 The subsystem shall use normal Hypertext Markup Language (HTML).

3.2.3 The subsystem shall consist of two separate pages.

3.2.4 One subsystem page shall contain the Java Applet which operates the Java Applet Subsystem.

This page will be known as the Main Page.

3.2.5 The Main Page shall display instructions for proper use of the Java Applet.

3.2.6 A second subsystem page shall contain information about the different temperature scales, their history, and equivalent calculations or conversions.

This page will be known as the About Page.

3.2.7 The subsystem shall make use of the Java Virtual Machine (JVM) that is resident on the computer on which the application is being used.

3.3 Java Applet Subsystem

3.3.1 The subsystem shall consist of a main panel and two sub-panel types.

3.3.2 The main panel shall contain instances of the sub-panels.

3.3.3 One sub-panel shall contain controls for input and display for a single temperature scale.

This sub-panel will be known as the Input Panel.

3.3.4 One sub-panel shall contain two controls; one to clear all the values in the other sub-panels, and a second to display the other page in the Web Page Subsystem.

This sub-panel will be known as the Control Panel.

3.3.5 There shall be five instances of the Input Panel and a single instance of the Control Panel.

3.3.6 When the user presses the enter key, temperature conversion shall occur.

The conversion process will be based on the location of the cursor. Cursor location in any data entry field makes that field the "active" field.

Temperature conversion calculations will be based on the temperature scale belonging to the panel containing the active field.

3.3.7 Any entry into a display area of an Input Panel shall be checked for validity when that entry is in the active field.

An invalid (non-numeric) entry in any Input Panel, when it contains the active field, should be treated as a zero numeric entry.

An empty entry in any Input Panel, when it contains the active field, should be treated as a zero numeric entry.

3.3.8 Both positive and negative numeric values shall be converted.

3.3.9 Numbers that are lower in absolute value than the lowest possible equivalent value of zero Kelvins shall be treated as zero Kelvins.

Any value entered that would result in a converted value for Kelvins that is less than zero should be changed to its lowest possible value that is equivalent to zero Kelvins.

There should be no maximum value for any temperature scale entry.

3.3.10 A single control on the Control Panel shall clear all fields in all Input Panels.

3.3.11 A single control on the Control Panel shall cause the browser to display the About Page.

The browser "back" controls will be used to return to the Main Page.

3.3.12 Returning to the Main Page from the About Page shall clear all previous temperature information.

3.3.13 The Input Panel labels shall not require any action.

3.3.14 The Input Panel entry fields shall be required to respond to a key press of the keyboard "Enter" key.

3.3.15 The Control Panel "Clear" button shall interface with the entry fields in all instances of the Input Panel.

3.3.16 The Control Panel "About" button shall display a new web page.

4 Computing Resource Requirements

4.1 External Interface Requirements

No additional requirements.

4.2 Software Item Internal Interface Requirements

No additional requirements.

4.3 Software Item Internal Data Requirements

No additional requirements.

4.4 Adaptation Requirements

No additional requirements.

4.5 Safety Requirements

No additional requirements.

4.6 Security and Privacy Requirements

No additional requirements.

4.7 Operating Environment

4.7.1 Computing Hardware Requirements

4.7.1.1 The TempConvApp shall be not require any special computing hardware to operate.

4.7.2 Computing Software Requirements

4.7.2.1 The TempConvApp shall be able to execute using any standard web browser.

4.7.2.2 The TempConvApp shall be able to use any JVM compatible with the Sun Java Standard.

4.7.2.3 The TempConvApp shall be backward compatible with JVM versions 1.3 and above.

4.8 Computing Resource Requirements

No additional requirements.

4.9 Software Quality Factors

No additional requirements.

4.10 Design and Implementation Constraints

No additional requirements.

4.11 Personnel-related Requirements

No additional requirements.

4.12 Training Requirements

No additional requirements.

4.13 Logistical Requirements

No additional requirements.

4.14 Other Requirements

No additional requirements.

4.15 Packaging Requirements

No additional requirements.

4.16 Precedence and Criticality of Requirements

No additional requirements.

5 Qualification Provisions

5.1 Qualification Methods

Requirements shall be qualified by analysis (A), inspection (I), test (T), demonstration (D) or special (S) as described in Table 6.

Table 6 - Qualification Method Descriptions

Qualification Code	Qualification Method	Description
A	Analysis	The processing of accumulated data obtained from other qualification methods. Examples are reduction, interpretation, or extrapolation of test results.
I	Inspection	The visual examination of software item code, documentation, etc.
T	Test	The operation of the software item, or a part of the software item, using instrumentation or other special test equipment to collect data for later analysis.
D	Demonstration	The operation of the software item, or a part of the software item, that relies on observable functional operation not requiring the use of instrumentation, special test equipment, or subsequent analysis.
S	Special	Any special qualification methods for the software item, such as special tools, techniques, procedures, facilities, and acceptance limits.

5.2 Qualification Matrix

Table 7 contains each requirement in section 3.0 and the method of verification. The test names provided in the "Test Name" column are detailed in the "Software Test Plan, TempConvApp Software" document.

Table 7 - Qualification Matrix

Paragraph Number	Requirement	Compliance Synopsis	Verif. Method	Test Name
3.2.1	The subsystem shall be displayed in a web page	Show that a web page browser window is capable of displaying the applet.	D	Integration test
3.2.2	The subsystem shall use normal Hypertext Markup Language (HTML).	Observe the current released version of the web page code.	I	Integration test
3.2.3	The subsystem shall consist of two separate pages.	Observe the installation directory and verify that two files with ".html" extents exist	I	Integration test

Paragraph Number	Requirement	Compliance Synopsis	Verif. Method	Test Name
3.2.4	One subsystem page shall contain the Java Applet which operates the Java Applet Subsystem.	Display the application in a browser window and verify that the applet appears	D	Operation test
3.2.5	The Main Page shall display instructions for proper use of the Java Applet.	Display the application in a browser window and verify that instruction text appears.	D	Operation test
3.2.6	A second subsystem page shall contain information about the different temperature scales, their history, and equivalent calculations or conversions.	Display the “About” page in a browser window and observe that information appears.	I	Integration test
3.2.7	The subsystem shall make use of the Java Virtual Machine (JVM) that is resident on the computer on which the application is being used.	Display the “Main” page in a browser window and verify that the application window appears.	D	Operation test
3.3.1	The subsystem shall consist of a main panel and two sub-panel types.	Observe the current released version of the web page code.	I	Integration test
3.3.2	The main panel shall contain instances of the sub-panels.	Observe the current released version of the web page code.	I	Integration test
3.3.3	One sub-panel shall contain controls for input and display for a single temperature scale.	Observe the current released version of the web page code.	I	Integration test
3.3.4	One sub-panel shall contain two controls; one to clear all the values in the other sub-panels, and a second to display the other page in the Web Page Subsystem.	Observe the current released version of the web page code.	I	Integration test
3.3.5	There shall be five instances of the Input Panel and a single instance of the Control Panel.	Observe the current released version of the web page code.	I	Integration test

Paragraph Number	Requirement	Compliance Synopsis	Verif. Method	Test Name
3.3.6	When the user presses the enter key, temperature conversion shall occur.	Display the “Main” page in a browser window and enter a numeric value in the top display area. Press the enter key and verify that values display in all display areas.	D	Operation test
3.3.7	Any entry into a display area of an Input Panel shall be checked for validity when that entry is in the active field.	Display the “Main” page in a browser window and enter a non-numeric value in the top display area. Press the enter key and verify that values display in all display areas, and that the starting text area contains a value of zero.	D	Operation test
3.3.8	Both positive and negative numeric values shall be converted.	Display the “Main” page in a browser window and enter a negative numeric value in the top display area. Press the enter key and verify that values display in all display areas.	D	Operation test
3.3.9	Numbers that are lower in absolute value than the lowest possible equivalent value of zero Kelvins shall be treated as zero Kelvins.	Display the “Main” page in a browser window and enter a negative numeric value in the Kelvin display area. Press the enter key and verify that values display in all display areas, and that the Kelvin display area contains a value of zero.	D	Operation test
3.3.9	Any value entered that would result in a converted value for Kelvins that is less than zero should be changed to its lowest possible value that is equivalent to zero Kelvins.	Display the “Main” page in a browser window and enter a numeric value in the top display area. Press the enter key and verify that values display in all display areas. Click the “Clear” button and observe that all display areas are cleared.	D	Operation test
3.3.11	A single control on the Control Panel shall cause the browser to display the About Page.	Display the “Main” page in a browser window and click the “About” button; observe that the “About” page is displayed.	D	Operation test

Paragraph Number	Requirement	Compliance Synopsis	Verif. Method	Test Name
3.3.12	Returning to the Main Page from the About Page shall clear all previous temperature information.	Perform the preceding test, then click the browser “back” button. Verify that all display areas are clear.	D	Operation test
3.3.13	The Input Panel labels shall not require any action.	Click on any or all labels and observe that no action is taken	D	Operation test
3.3.14	The Input Panel entry fields shall be required to respond to a key press of the keyboard “Enter” key.	Display the “Main” page in a browser window and enter a numeric value in the top display area. Press either enter key and verify that values display in all display areas.	D	Operation test
3.3.15	The Control Panel “Clear” button shall interface with the entry fields in all instances of the Input Panel.	Display the “Main” page in a browser window and enter a numeric value in the top display area. Press the enter key and verify that values display in all display areas. Click the “Clear” button and observe that all display areas are cleared.	D	Operation test
3.3.16	The Control Panel “About” button shall display a new web page.	Display the “Main” page in a browser window and click the “About” button; observe that the “About” page is displayed.	D	Operation test
4.7.1.1	The TempConvApp shall be not require any special computing hardware to operate.	Execute the operation test using TempConvApp applications installed on several different platforms. Verify all operations work properly.	D	Operation test
4.7.2.1	The TempConvApp shall be able to execute using any standard web browser.	Execute the operation test using several different web browsers. Verify all operations work properly.	D	Operation test
4.7.2.2	The TempConvApp shall be able to use any JVM compatible with the Sun Java Standard.	Execute the operation test using TempConvApp applications installed on several platforms with different versions of Java. Verify all operations work properly.	D	Operation test

Paragraph Number	Requirement	Compliance Synopsis	Verif. Method	Test Name
4.7.2.3	The TempConvApp shall be backward compatible with JVM versions 1.3 and above.	Execute the operation test using TempConvApp applications installed on several platforms with different versions of Java. Verify all operations work properly.	D	Operation test

5.3 Distribution Provisions

The completed software will be distributed as a set of Java "class" files, along with the corresponding two HTTP web pages and associated graphics files, on a standard CD-ROM disk. Installation files and instructions will be provided for all three platforms specified.

Installation may be provided either on individual machines in the enterprise, or on a central server machine accessible from a company intranet, but not both.

In the case of individual installations, no extra licensing is required; the program may be installed on as many machines as is required, as long as the files remain only on the machines located at the company of issue, and as long as the machines are located inside a firewall preventing access from outside.

In the case of a central server installation, the individual machines may access the program without restriction, with the proviso that the program may not be copied onto the individual machines.

It is incumbent upon the system administration personnel installing the application to ensure that the proper version of the Java Virtual Machine is provided on all machines which will use the program.

6 Requirements Traceability

Table 8 shows the traceability of the TempConvApp Subsystem requirements to the requirements in this document. Any requirements not mapped to a higher level system requirement are considered as derived requirements.

Table 8- Verification Cross Reference Matrix

TempConvApp Statement of Work Requirement		TempConvApp Requirements Document Paragraph
Paragraph Number	**Description**	
3.2.3.1.1	The subsystem shall be displayed in a web page.	3.2.1
3.2.3.1.2	The subsystem shall use normal Hypertext Markup Language (HTML).	3.2.2
3.2.3.1.3	The subsystem shall consist of two separate pages.	3.2.3
3.2.3.1.4	One subsystem page shall contain the Java Applet which operates the Java Applet Subsystem.	3.2.4
3.2.3.1.5	The Main Page shall display instructions for proper use of the Java Applet.	3.2.5
3.2.3.1.6	A second subsystem page shall contain information about the different temperature scales, their history, and equivalent calculations or conversions.	3.2.6
3.2.3.1.7	The subsystem shall make use of the Java Virtual Machine (JVM) that is resident on the computer on which the application is being used.	3.2.7
3.2.3.2.1	The subsystem shall consist of a main panel and two sub-panel types.	3.3.1
3.2.3.2.2	The main panel shall contain instances of the sub-panels.	3.3.2
3.2.3.2.3	One sub-panel shall contain controls for input and display for a single temperature scale.	3.3.3
3.2.3.2.4	One sub-panel shall contain two controls; one to clear all the values in the other sub-panels, and a second to display the other page in the Web Page Subsystem.	3.3.4
3.2.3.2.5	There shall be five instances of the Input Panel specified in item 3.2.3.2.4, and a single instance of the Control Panel specified in item 3.2.3.2.5.	3.3.5
3.2.3.2.6	When the user presses the enter key, temperature conversion shall occur.	3.3.6
3.2.3.2.7	Any entry into a display area of an Input Panel shall be checked for validity when that entry is in the active field.	3.3.7
3.2.3.2.8	Both positive and negative numeric values shall be	3.3.8

TempConvApp Statement of Work Requirement		TempConvApp Requirements Document Paragraph
Paragraph Number	**Description**	
3.2.3.1.1	The subsystem shall be displayed in a web page.	3.2.1
	converted.	
3.2.3.2.9	Numbers that are lower in absolute value than the lowest possible equivalent value of zero Kelvins shall be treated as zero Kelvins.	3.3.9
3.2.3.2.10	A single control on the Control Panel shall clear all fields in all Input Panels.	3.3.10
3.2.3.2.11	A single control on the Control Panel shall cause the browser to display the About Page.	3.3.11
3.2.3.2.12	Returning to the Main Page from the About Page shall clear all previous temperature information.	3.3.12
3.2.4.2.1	The Input Panel labels shall not require any action.	3.3.13
3.2.4.2.2	The Input Panel entry fields shall be required to respond to a key press of the keyboard “Enter” key.	3.3.14
3.2.4.2.3	The Control Panel “Clear” button shall interface with the entry fields in all instances of the Input Panel.	3.3.15
3.2.4.2.4	The Control Panel “About” button shall display a new web page.	3.3.16
3.2.10.1	The TempConvApp application shall operate in all standard web browser applications including, but not limited to, Microsoft Internet Explorer, Netscape Navigator, Opera Web Browser, and Mozilla FireFox Browser.	4.7.2.1
Derived Requirement	The TempConvApp shall be not require any special computing hardware to operate.	4.7.1.1
Derived Requirement	The TempConvApp shall be able to execute using any standard web browser.	4.7.2.1
Derived Requirement	The TempConvApp shall be able to use any JVM compatible with the Sun Java Standard.	4.7.2.2
Derived Requirement	The TempConvApp shall be backward compatible with JVM versions 1.3 and above.	4.7.2.3

7 Appendices

7.1 Acronyms

Table 9- Acronyms

Acronym	Definition / Description
HTML	Hyper Text Markup Language
JVM	Java Virtual Machine
SRS	Software Requirement Specification
VCRI	Verification Cross Reference Index
VCRM	Verification Cross Reference Matrix