Requirements Analysis Document

Employee Scheduling System
CSCI 4711 Software Engineering
Fall 2016
Augusta University
Augusta, GA
Date: 10 October 2016
Version 2

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Abstract

This document contains the requirements, analysis and design artifacts for the Employee Scheduling System (ESS) software system. ESS is a personnel scheduling system that facilitates the employee submission and subsequent supervisor approval or denial of time off requests.

The rest of this document is structured as follows: Chapter 1 contains the introduction. This chapter presents a brief description of the system. Chapter 2 outlines the functional requirements of the system. In addition, Chapter 2 contains use case diagrams and use case descriptions for all use cases involved in ESS. Lastly, the requirement analysis will be outlined in Chapter 2 on next revision of RAD document. Chapter 3 illustrates key GUI screen mockups for the Employee Scheduling System.

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1 INTRODUCTION

1.1 OVERVIEW OF SYSTEM

The Employee Scheduling System (ESS) is a system for Employers to manage time off requests. ESS includes actors such as Employees and Supervisors who represent workers of any given business. ESS allows Employees and Supervisors to schedule time off. Supervisors have administrative authority to approve or deny all time off requests from Employees and Supervisors. Supervisors will have access to a queue that will hold all time off requests from Employees and Supervisors. The ESS software will allow efficient management of submitting time off requests, approval of time off requests, denial of time off requests, and status of time off requests.

1.2 SCOPE OF SYSTEM

The Employee Scheduling System (ESS) is a system used to provide simple and efficient means for an employee to request time off and for appointed supervisors to administrate, approve, or deny those requests. ESS has an internal database with authorized users and their password hashes. Employees can submit requests for time off, which are stored in the database. Supervisors are then able to see the contents of the time off requests, the employee that initiated it, and the reason for the request. Once the Supervisor responds to a request, it is removed from the Supervisor's queue and the database. The system includes secure login, logout functionality in addition to the primary scheduling applications.

1.2 OVERVIEW OF DOCUMENT

The rest of the document is structured as follows: Chapter 2 outlines the functional requirements of the system, then the use case diagram. Individual detailed use case descriptions are then listed. Chapter 3 depicts several individual user interface mockups.

2 REQUIREMENTS OF SYSTEM

2.1 FUNCTIONAL REQUIREMENTS

- **Login –** All users, **Employees** and **Supervisors**, must supply valid login credentials (EmployeeID and password) to be authorized to access and use the system. Upon doing so, the user will have created a session with ESS, where a user can modify database contents through normal usage. Valid login will direct the user to his or her appropriate activity based on the user's class.
    - **InvalidLogin** – Handle invalid credentials, out-of-scope characters, and exploitation attempts. Returns control to user after job.
- **Logoff –** All users must have clear and immediate access to a Logoff button in order to gracefully and securely close the connection with ESS. Resources allocated to a user session must be terminated in an orderly fashion as to eliminate potential software bugs. Every form or interface must have a clearly marked Logoff button.
- **TimeOffRequest – Employees** must be able to supply a time off request in the Time Off Request form. Employee will select dates via the calendar GUI. Radio buttons enable the **Employee** to indicate the reason (and weight) of his or her request. The user can then submit or logout from that form. Then the system sends time off request to the database.
- **RequestResponse – Supervisors** must be able to view the time off requests that have been submitted in a scroll box queue. The queue will have highlighted regions that correspond to the reason (or weight) supplied by the user's time off request. The **Supervisor** can then approve, deny, or logout from this window. Approvals and denials modify database contents and update the queue, while logout will terminate the session gracefully.
    - **ApproveRequest** – Approves Employee request and updates relevant database data.
    - **DenyRequest** – Denies Employee request and updates relevant database data

2.2 USE CASE DIAGRAM

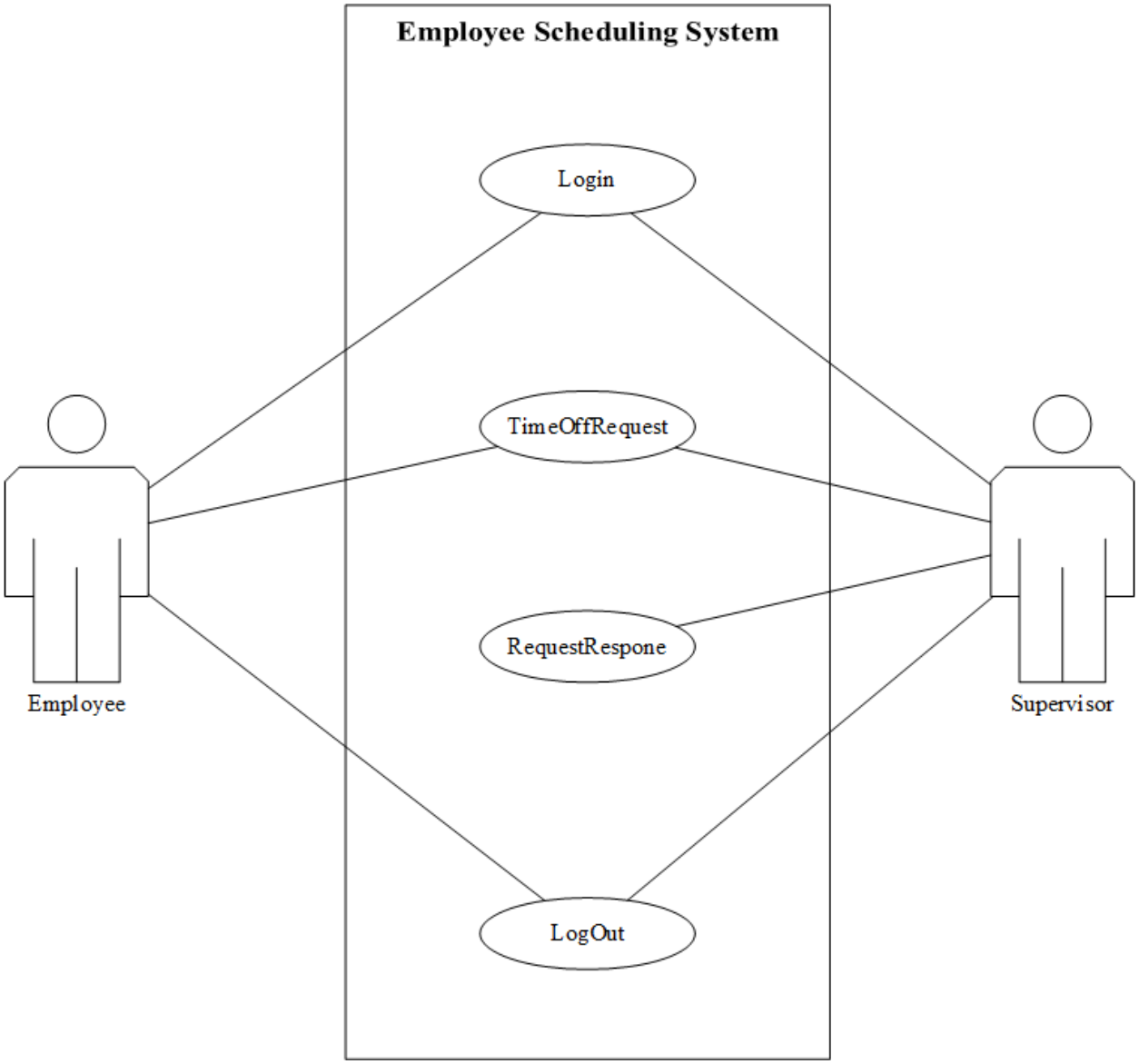

Figure 2.1 use case diagram for ESS

2.3 USE CASE DESCRIPTIONS

Use case name	Login
Participating actors	Initiated by Employee or Supervisor
Flow of events	1. Employee enters their user ID in User ID field and Password in Password field. 2. **ESS responds by authenticating the entered user ID and Password**. 3. **The ESS will distinguish if User is Employee or Supervisor via SQL query.** 4. **The Time Off Request interface will open for Employee and the Supervisor Menu interface will open for Supervisor.**
Entry condition	
Exit condition	User ID and password are authenticated via SQL query.
Security requirements	The password must be hashed at all times. The dialogue boxes that handle username and password must be shielded against code execution and SQL injections. Password policy must be used to eliminate malicious input. Windows shortcut-key exploits must be disabled to avoid accessing a shell or forcing an exploit. Only <ENTER> will be recognized for acknowledgement of the message/dialogue box.

Figure 2.2: Login: valid login

Use case name	Login
Participating actors	Initiated by Employee or Supervisor**.**
Flow of events	1. User supplies invalid credentials to the login interface. 2. **System handles the input, returning a user-specific error in a pop-up message/dialog box. A dialogue box pops up to alert User of invalid login.** 3. The user must acknowledge the button in the dialog/box in order to proceed. 4. **System returns the user to the login page, where the user is then able to try to enter valid credentials once more.**
Entry condition	
Exit condition	The user acknowledges the invalid entry.
Security requirements	The password must be hashed at all times. The dialogue boxes that handle username and password must be shielded against code execution and SQL injections. Password policy must be used to eliminate malicious input. Windows shortcut-key exploits must be disabled to avoid accessing a shell or forcing an exploit. Only <ENTER> will be recognized for acknowledgement of the message/dialogue box.

Figure 2.3: Login: invalid login

Use case name	Logout
Participating actors	Initiated by Employee or Supervisor
Flow of events	1. Employee presses the logout button on the Time Off Request interface or Supervisor presses logout button on Supervisor Menu Form, Time Off Request interface, or Request Response interface. **2. System closes any open form (Supervisor Dashboard, Time Off Request interface, or Response Request interface) and returns user to the login interface.**
Entry condition	Employee or Supervisor is logged in to the ESS system.
Exit condition	Employee or Supervisor is logged out and returned to the login interface.
Security requirements	Resources allocated to the session must be terminated properly to ensure there are no bugs in the software.

Figure 2.4: Logout

Use case name	RequestResponse
Participating actors	Initiated by Supervisor
Flow of events	1. **ESS displays Employee Time Off Request in the Supervisor's Time Off Request queue**. 2. Supervisor selects the appropriate request from Time Off Request queue on the Request Response interface. 3. Supervisor clicks Approve. 4. **ESS updates Time Off Request status field in database with "Approved".**
Entry condition	The Supervisor selects Time Off Request Response button from Supervisor Menu Form.
Exit condition	Time Off Request status field in database with "Approved".
Security requirements	All responses are tracked by User ID ensuring that no unauthorized individuals are able to surreptitiously gain access to a request.

Figure 2.5: RequestResponse: Approve

Use case name	RequestResponse
Participating actors	Initiated by Supervisor
Flow of events	1. **ESS displays Employee Time Off Request in the Supervisor's Time Off Request queue**. 2. Supervisor selects the appropriate request from Time Off Request queue on the Request Response interface. 3. Supervisor clicks Deny. 4. **ESS updates Time Off Request status field in database with "Denied".**
Entry condition	The Supervisor selects Time Off Request Response button from Supervisor Menu Form.
Exit condition	Time Off Request status field in database with "Denied".
Security requirements	All responses are tracked by User ID ensuring that no unauthorized individuals are able to surreptitiously gain access to a request.

Figure 2.6: RequestResponse: Deny

Use case name	TimeOffRequest
Participating actors	Initiated by Supervisor or Employee
Flow of events	1. Employee successfully logs into the system or Supervisor selects Time Off Request from Supervisor Menu form. **2. ESS presents the Time Off Request form for the Employee or Supervisor to select a date to request time off.** 3. The Employee or Supervisor select a date, time and a reason per request. **4. ESS receives the form and pushes following fields to the database tables: Employee/Supervisor name, request date, request time, and request reason.** **5. ESS populates the appropriate employee and supervisor time off request queues.**
Entry condition	The Supervisor selects Request Time Off button from Supervisor Menu Form.
Exit condition	The employee's time off request is reflected in the appropriate employee and supervisor queues.
Security requirements	

Figure 2.7: TimeOffRequest

2.4 Requirements Analysis

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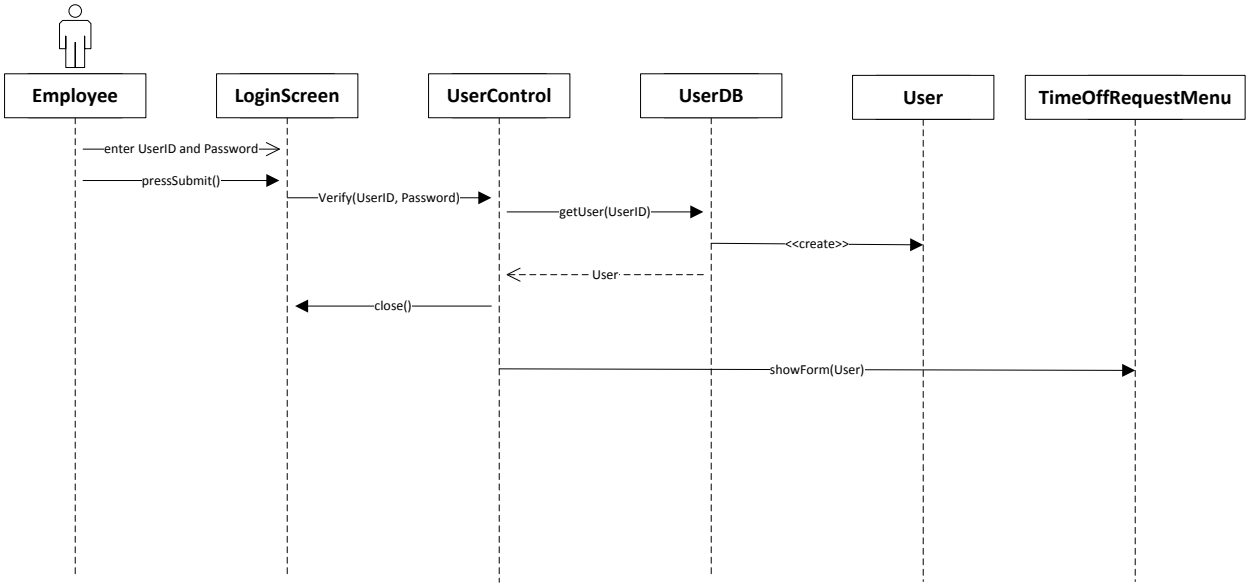
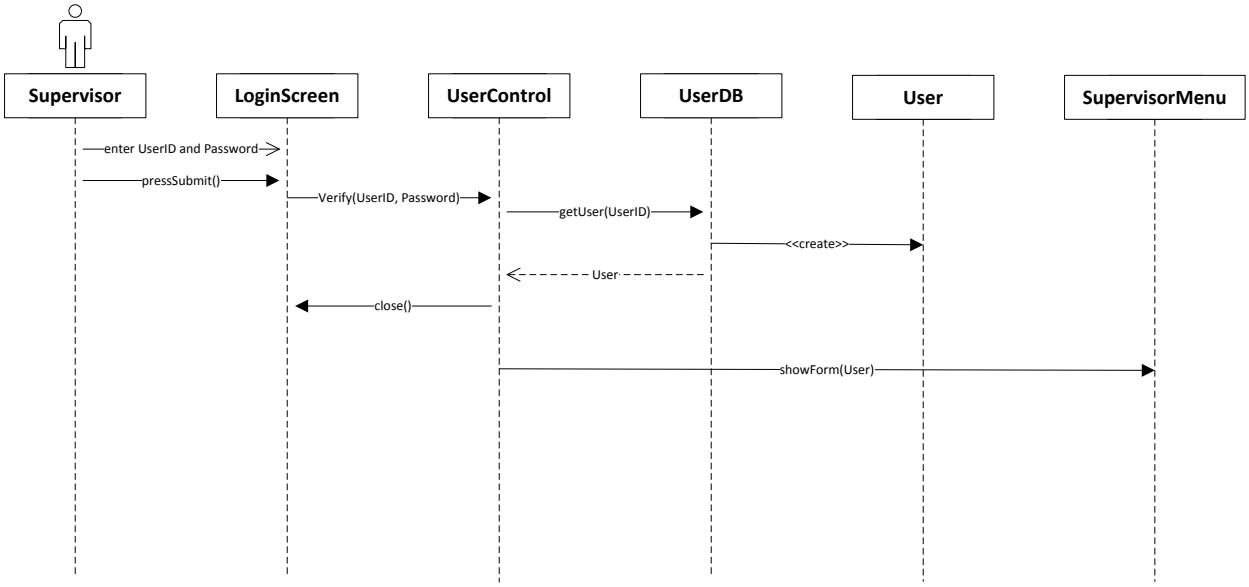
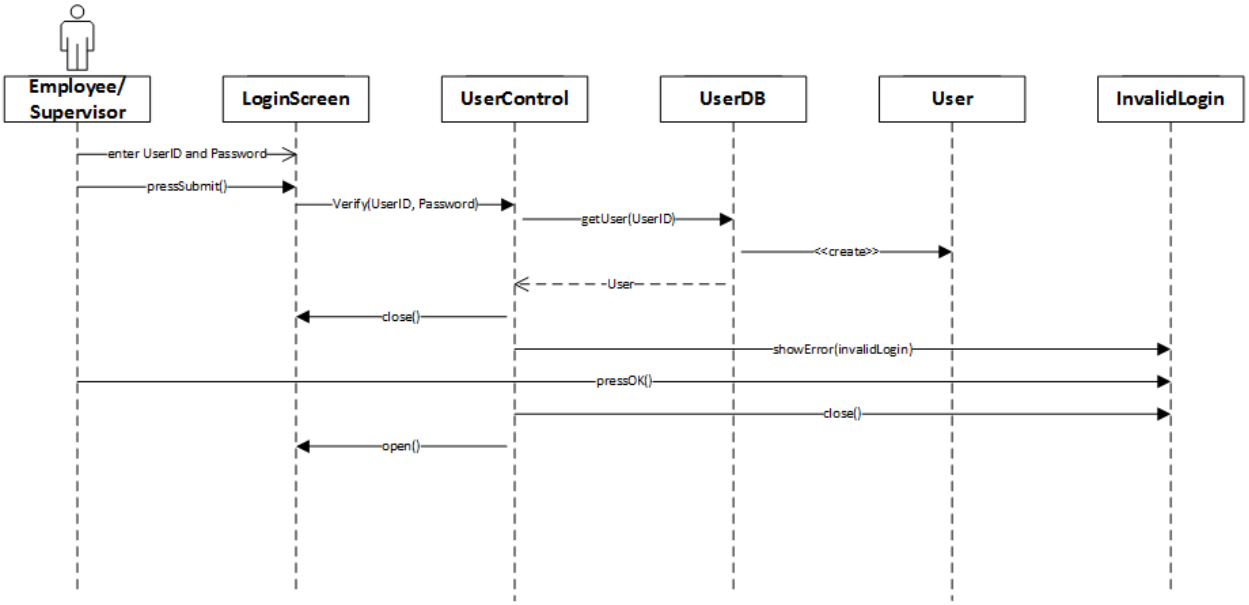


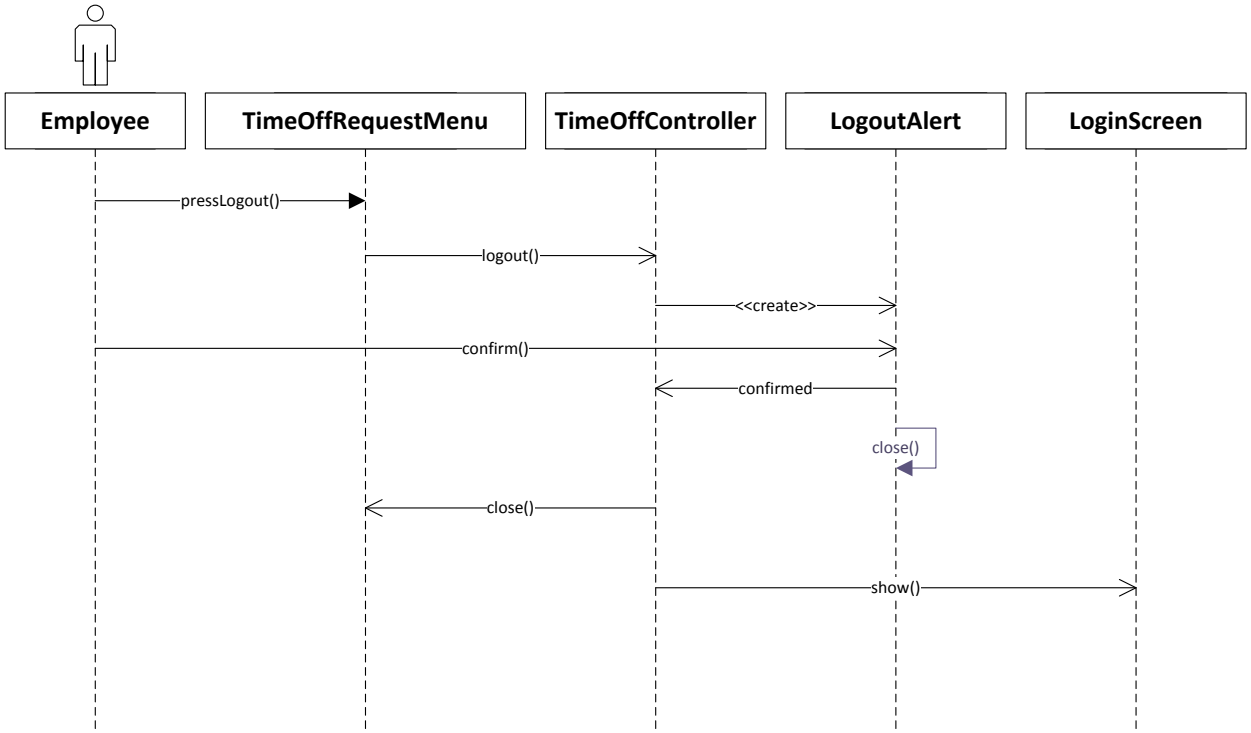
EmployeeLogin (non-supervisor) sequence



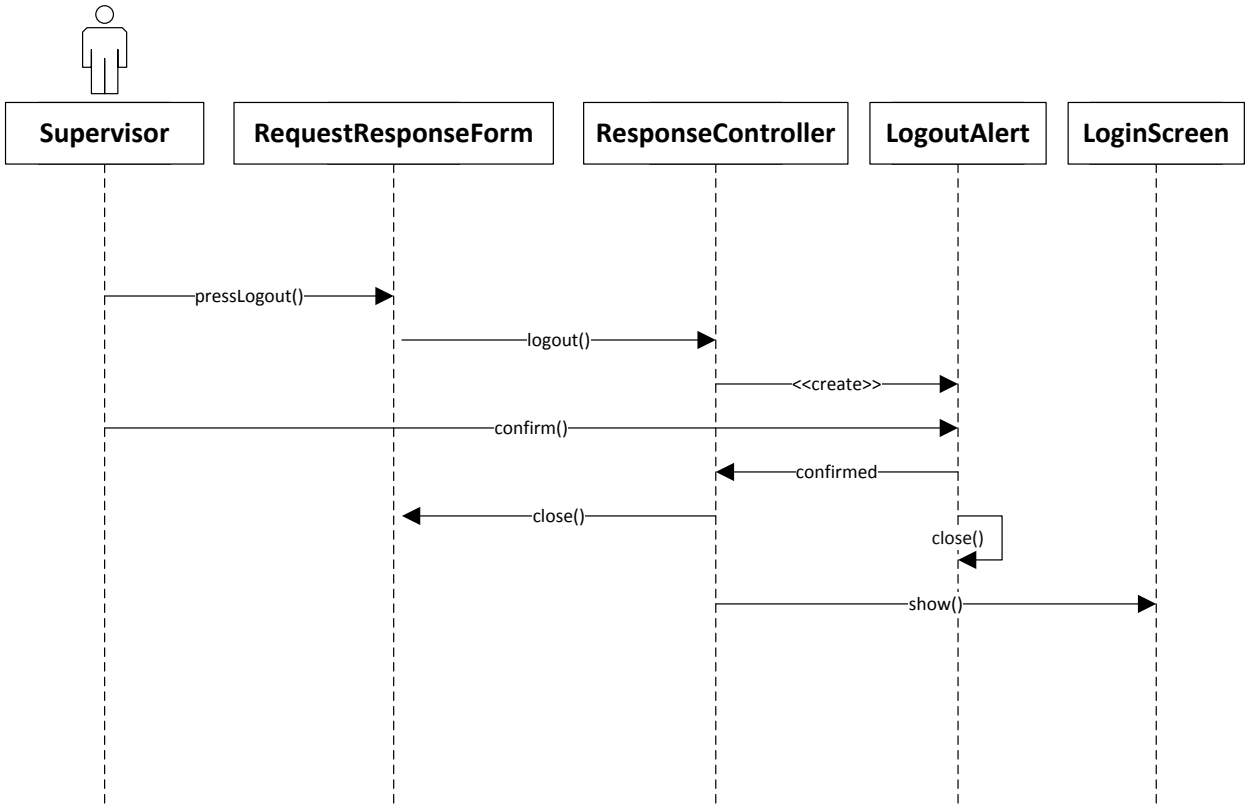
EmployeeLogin (supervisor) sequence



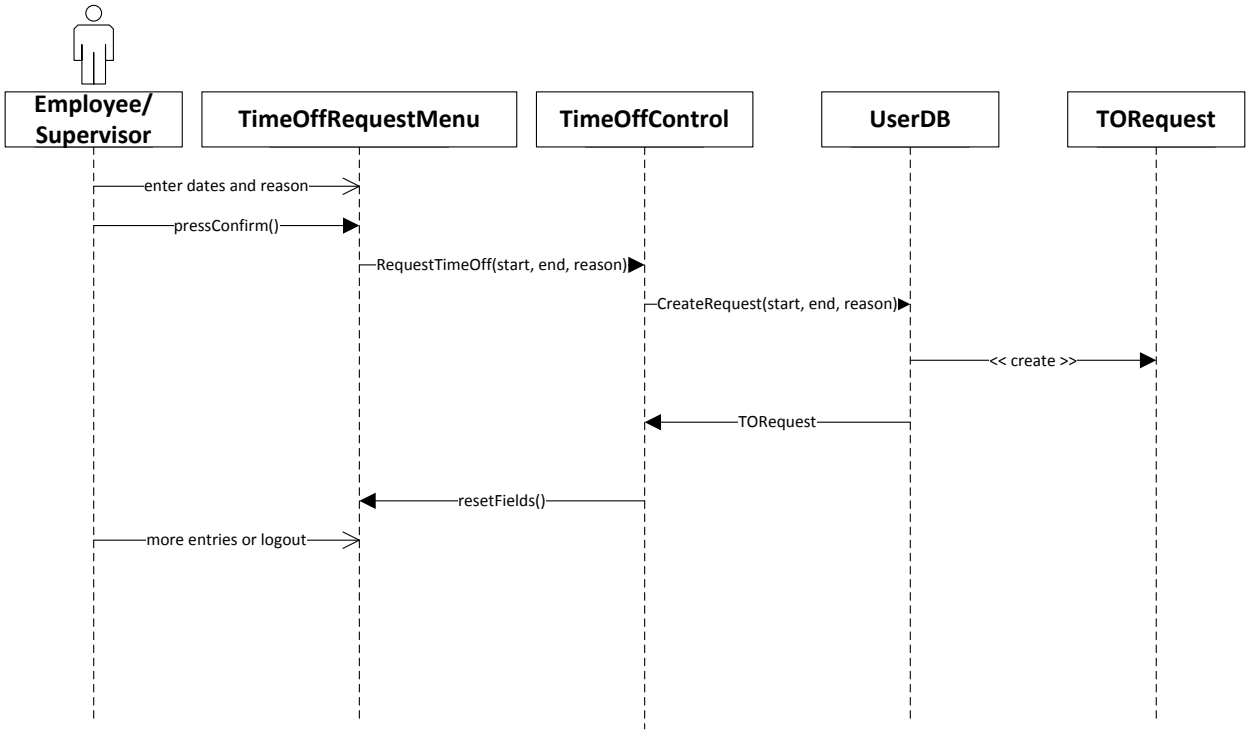
InvalidLogin sequence



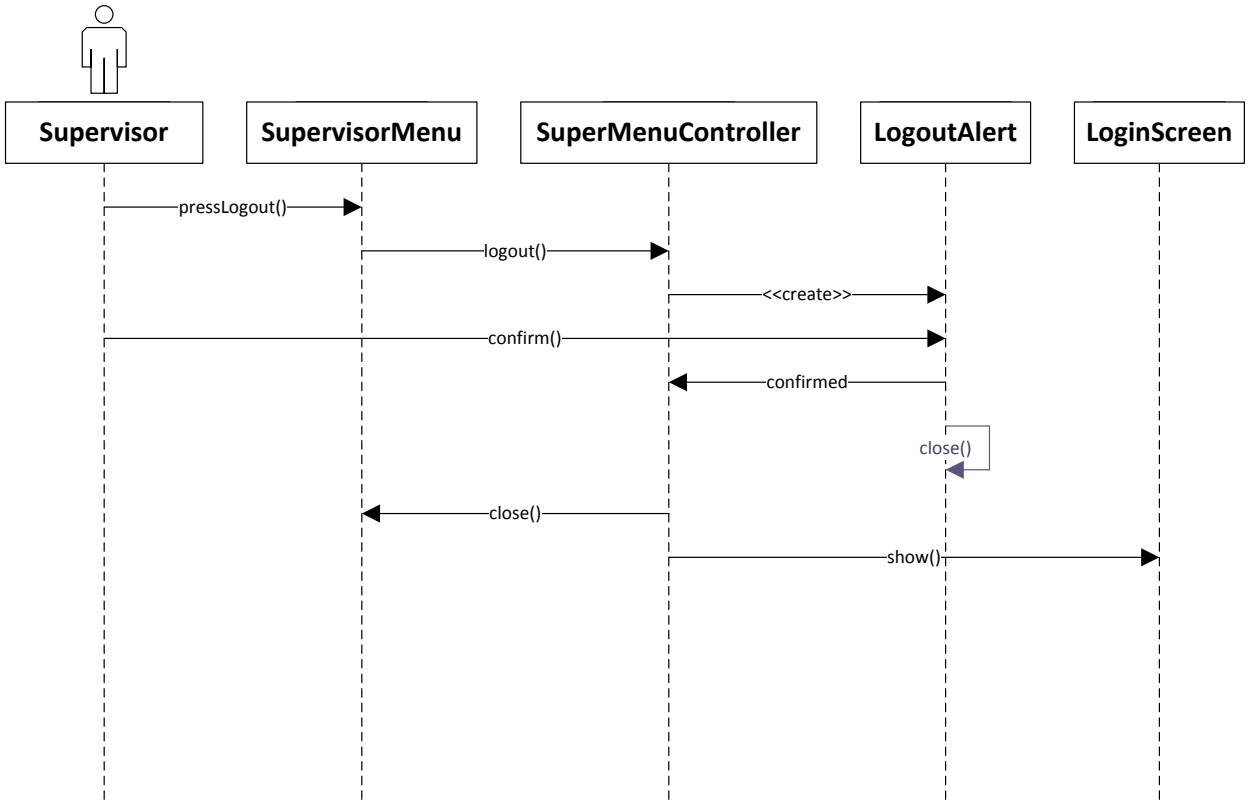
RequestTimeOffLogout sequence



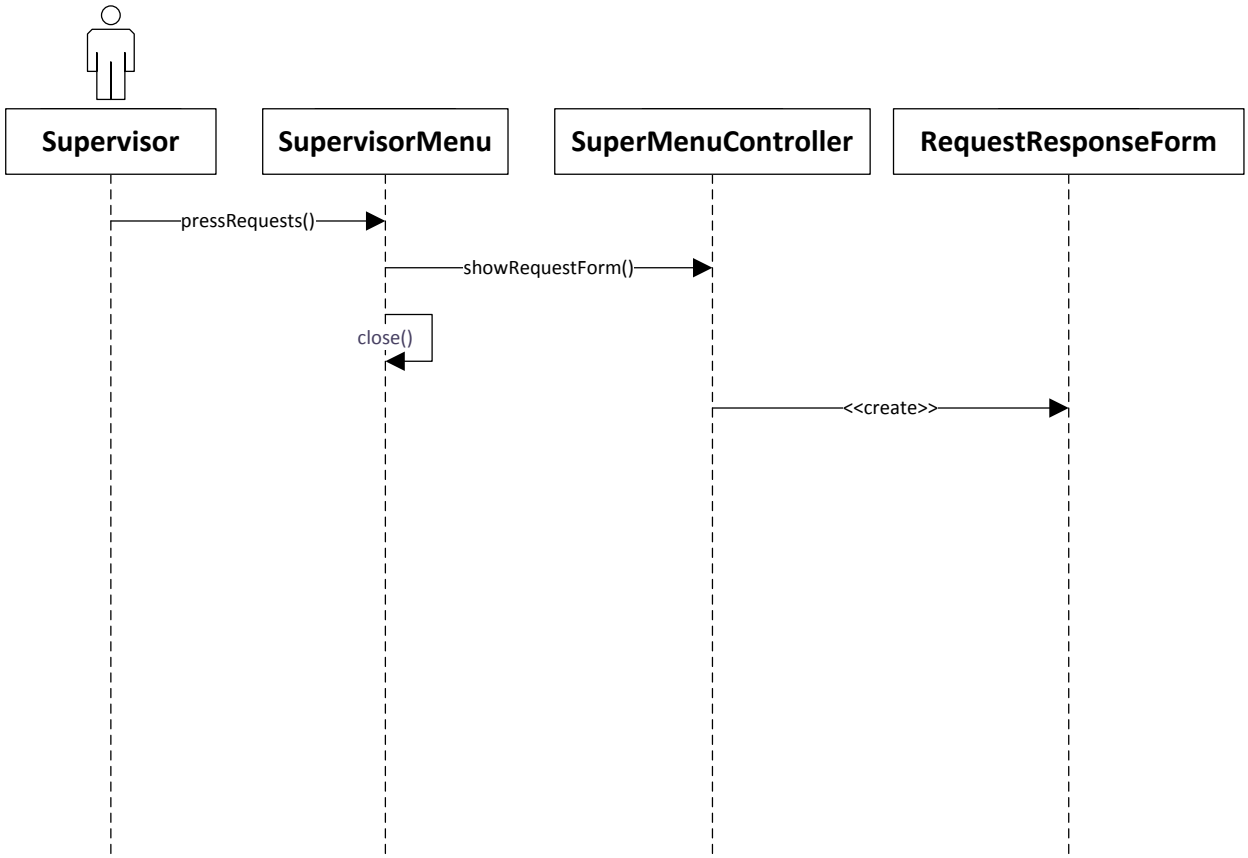
RequestResponseLogout sequence



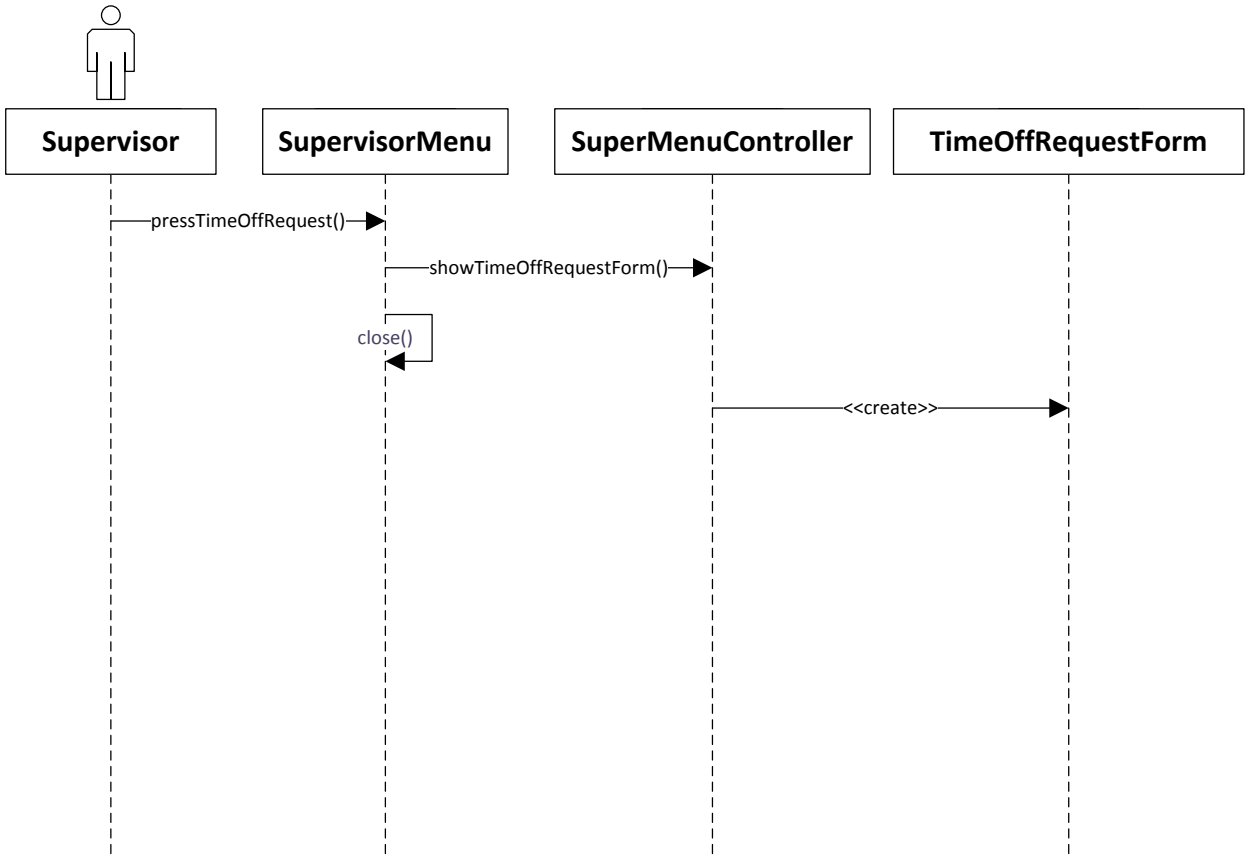
RequestTimeOff sequence



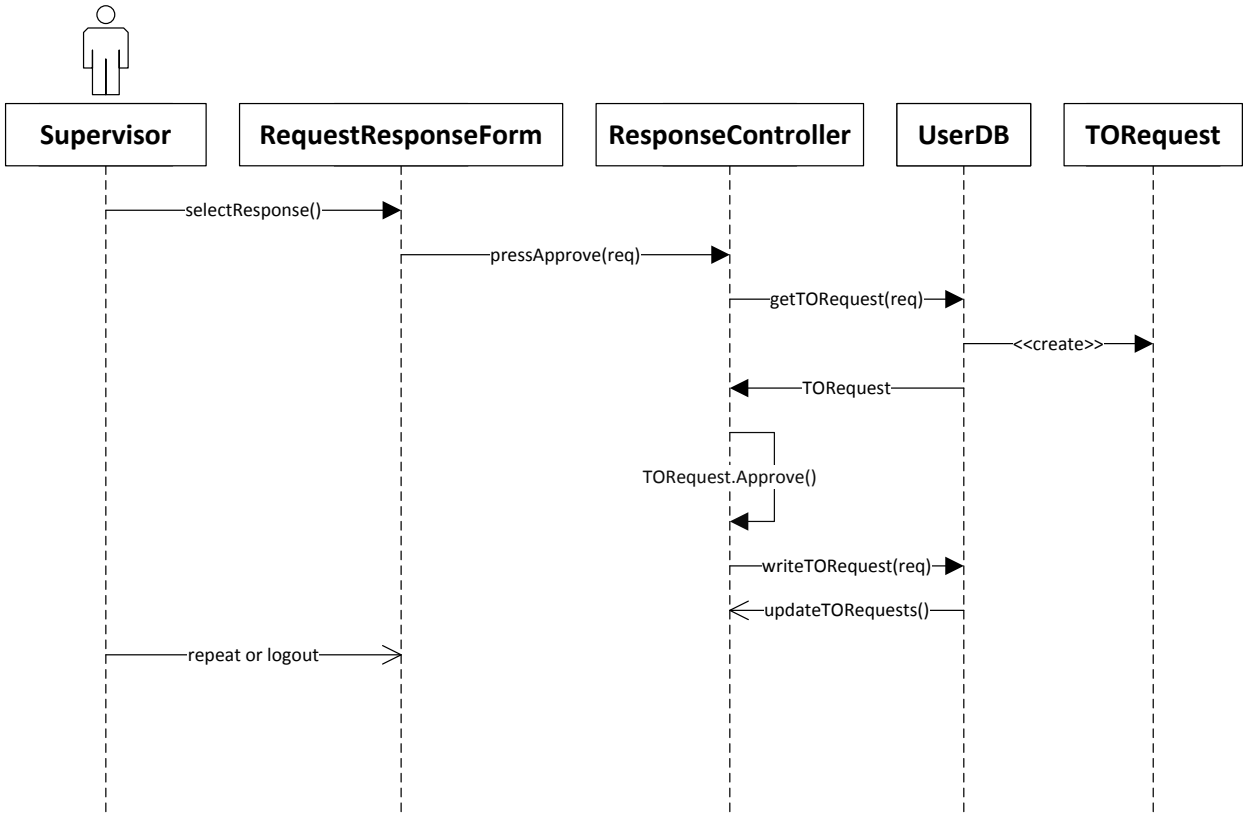
SupervisorMenuLogout sequence



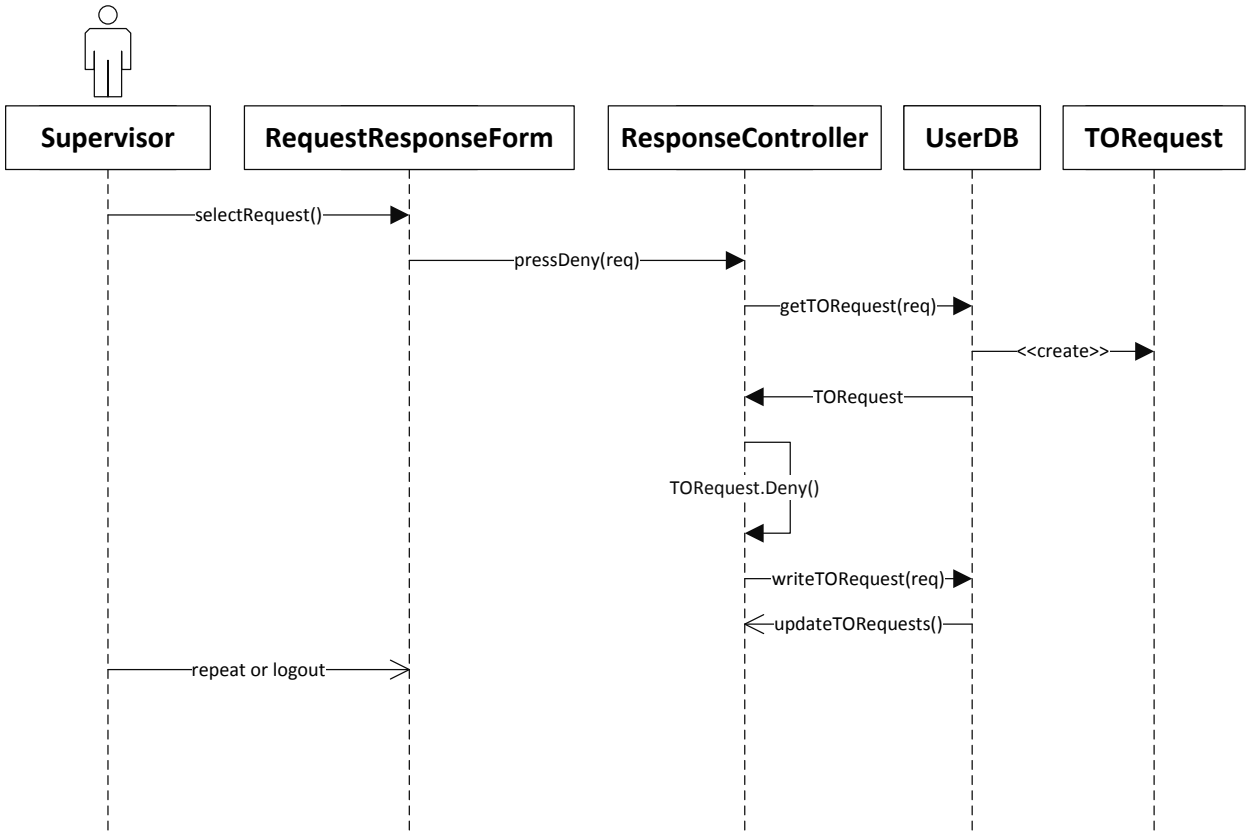
SupervisorMenuReqResponseForm sequence



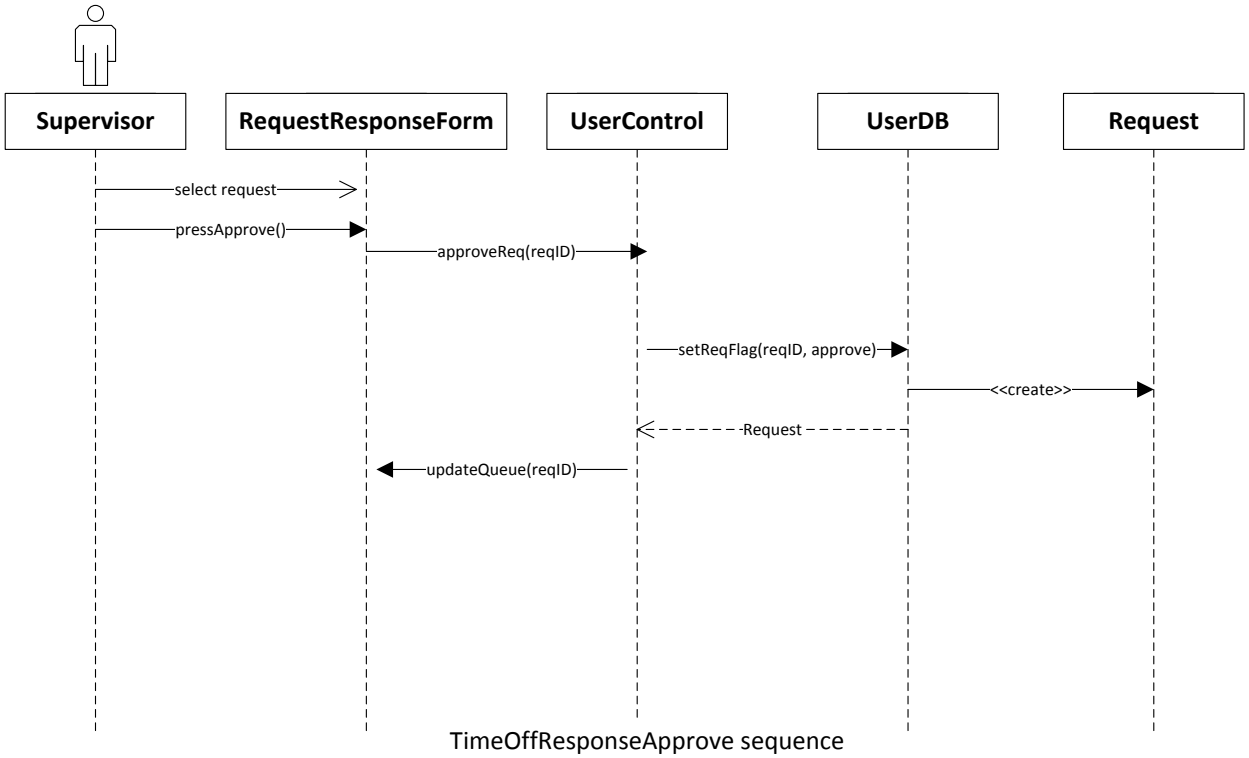
SupervisorMenuTimeOffRequest sequence



RequestResponseApprove sequence



RequestResponseDeny sequence

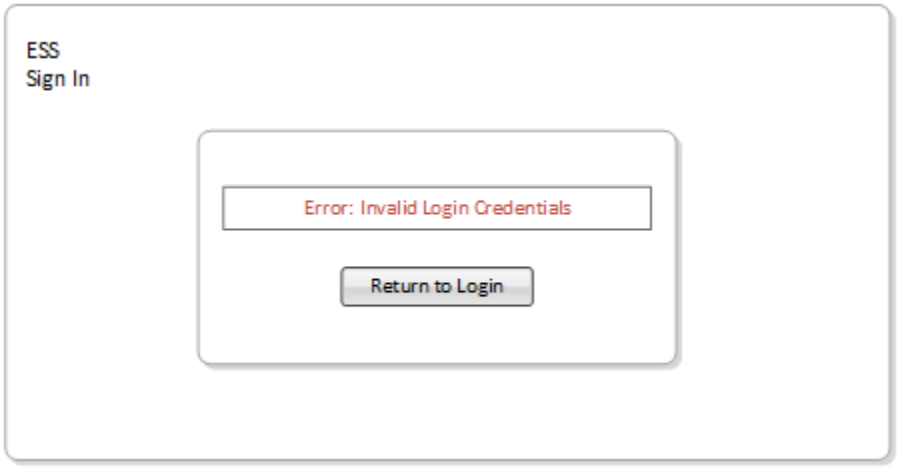


TimeOffResponseApprove sequence

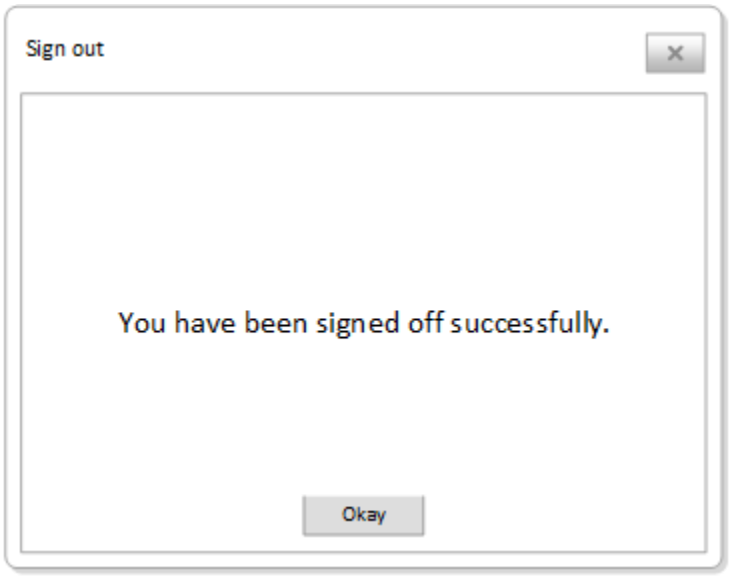
3 USER INTERFACE MOCKUPS

3.1 LOGIN

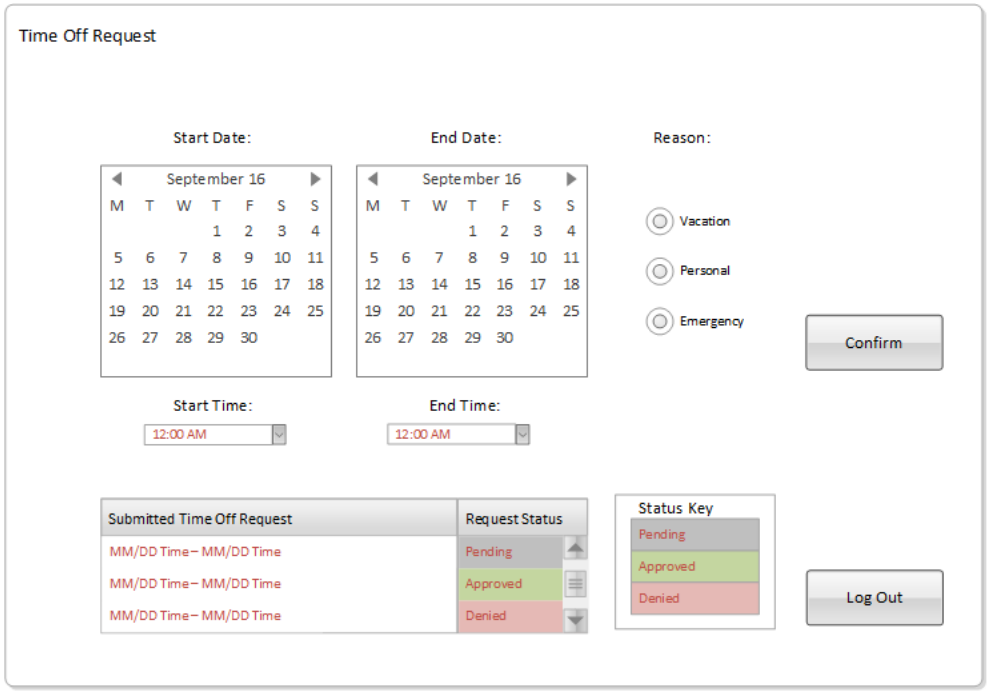
3.2 INVALIDLOGIN



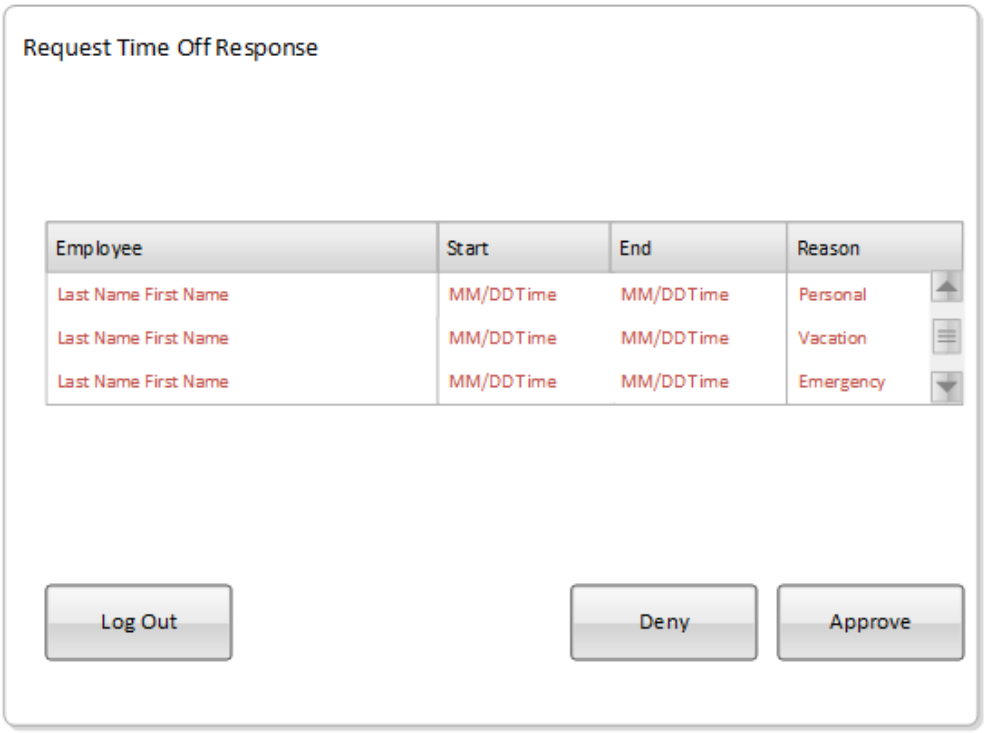
3.3 LOGOUT



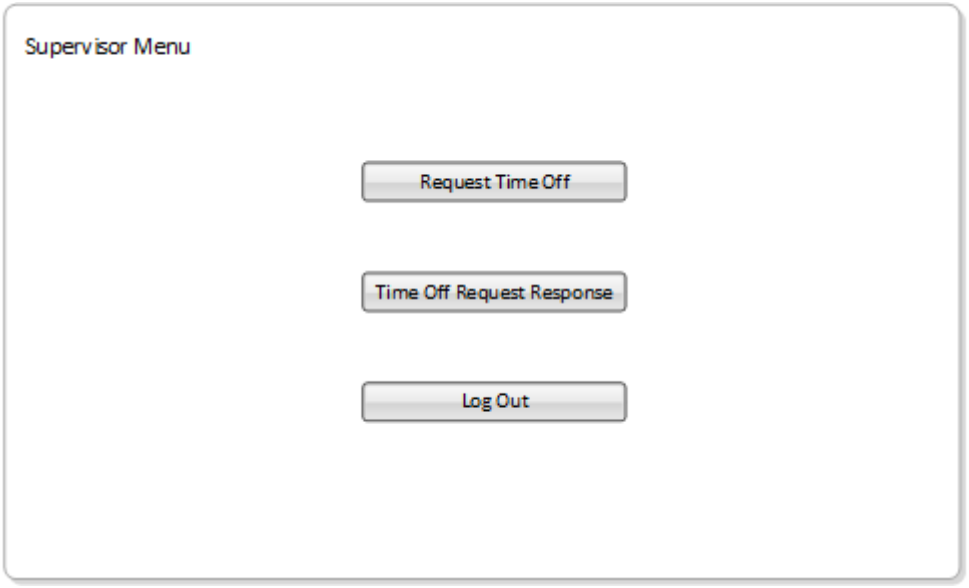
3.4 TIMEOFFREQUEST



3.5 RequestResponse



3.6 SupervisorMenu



4 REVISION HISTORY

Version #, Section #: Item Modified
Version 2, All Sections: Corrected formatting
Version 2, Section 1.1, Overview of System: Added system overview
Version 2, Section 2.1, Functional Requirement: Logoff
Version 2, Section 2.4 Analysis Requirements: Added sequence diagrams