

The Application

申请书

You have been tasked to develop a '**Leave Application Processing System**' (LAPS). Employees of NUS-ISS will be able to access this system from NUS-ISS intranet web site. The system will accommodate three types of employee roles, namely: Administrators, Managers and Employees.

你的任务是开发一个“请假申请处理系统”(LAPS)。NUS-ISS 的员工将能够从 NUS-ISS 的内部网站访问该系统。该系统将适应三种类型的员工角色，即：管理员，经理和雇员。

- **Employees** are enabled to apply/cancel/update their leave.

雇员可申请/取消/更新假期。

- **Managers** are responsible for leave approval/rejection process. Managers can also print consolidated leave reports.

管理者负责休假批准/拒绝流程。管理者还可以打印综合休假报告。

- **Administrators** are responsible for creating, managing users and respective roles. They are also responsible for managing the approval hierarchy.

管理员负责创建、管理用户和各自的角色。他们还负责管理审批层次结构。

There are *three categories* of leave that an employee is entitled to claim. They are annual leave, medical leave, and compensation leave. An employee has to take full day leave for all entitlement except compensation leave. For compensation leave, the granularity is half a day. Every four hours of overtime work makes an employee eligible for half-a day compensation.

员工有权申请三种类型的假期。它们是年假、病假和补偿假。除了补偿假之外，员工必须休全天假。补偿假的粒度是半天。每加班 4 小时，员工就有资格获得半天的补偿。

The team must design, develop, test and release a web-based application, using a standard RDBMS such as MySQL. The team should use a model-view-controller architecture using Spring MVC Framework. A reasonable business layer is expected to validate leave type, claim dates, eligibility and approval processes. The persistent data layer can be implemented using Spring Data JPA ORM framework.

团队必须使用标准的 RDBMS (如 MySQL)来设计、开发、测试和发布一个基于网络应用程序。团队应该使用一个使用 Spring MVC 框架的模型-视图-控制器架构。一个合理的业务层需要验证休假类型、申请日期、资格和批准流程。持久数据层可以使用 Spring Data JPA ORM 框架实现。

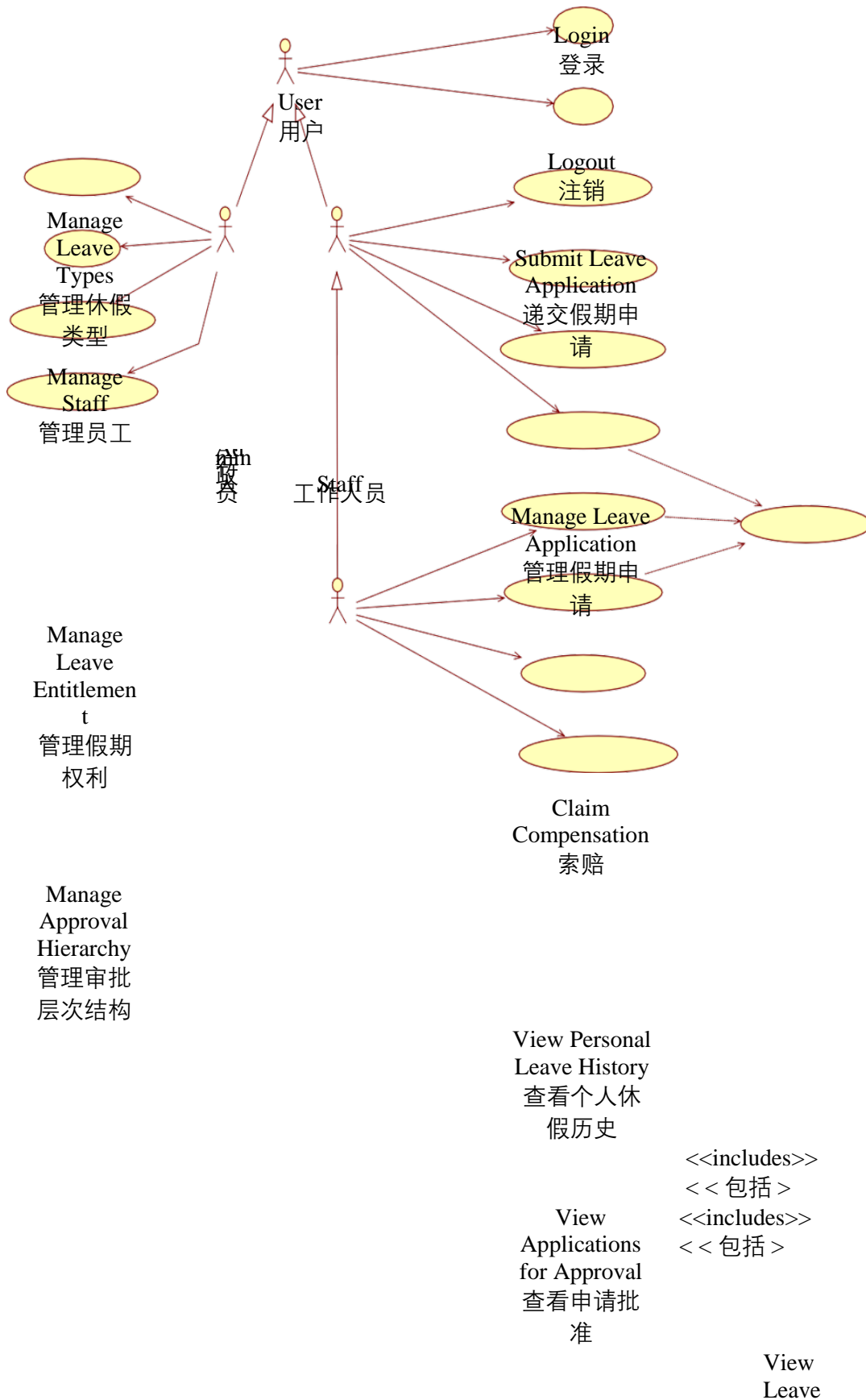
The features of the system are listed in two groups. Mandatory features must be implemented. A good implementation of all Mandatory features alone will earn the team a pass. To maximize the marks attained, you should implement some of the Optional features described below. Optional features are not listed in any particular order, and you should prioritize them as you see fit.

该系统的特性分为两组。必须实施强制性功能。一个好的实现所有的强制性功能本身将为团队赢得通行证。为了使得分数最大化，你应该实现下面描述的一些可选特性。可选功能没有按照特定的顺序列出，你应该根据自己的需要对它们进行优先排序。

It is important to note that implementing features (optional as well as mandatory) badly can actually make you lose marks rather than gain them. It is important you give the appropriate amount of thought to the design of each feature you implement. The functionality of your system should be potentially usable in a real-life site. **Usability and robustness should be high in your list of priorities.**

需要注意的是，糟糕地实现特性(可选的和强制的)实际上会让你失去分数而不是获得分数。重要的是，你要对你实现的每个特性的设计给予适当的考虑。你的系统的功能性应该可以在现实生活中的网站上使用。可用性和稳健性应该是你优先考虑的事情。

Use Case Model 用例模型



Application
查看假期申请表

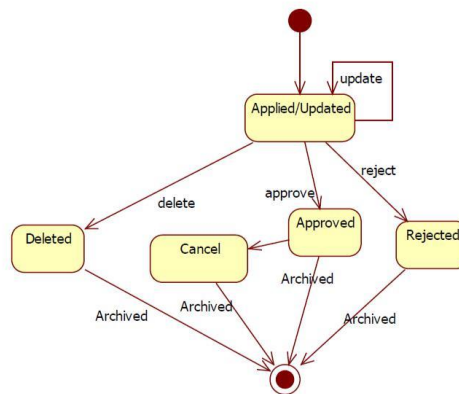
<<includes>>
<< 包括 >

View
Employee
Leave History
查看员工离职记录

Manager
经理

Approve/Reject Leave
批准/拒绝休假
Approve Compensation Claim
批准赔偿要求

Leave Application Status – State Transition Diagram 离开申请状态-状态转换图



Mandatory Features

强制性功能

Supported Leave Types

支持休假类型

Your system must support three types of leave: Annual, Medical and Compensation.

您的系统必须支持三种类型的假期: 年假、医疗假和补偿假。

Login

登录

The application will have one entry point (URL) for all Employees, Managers and Admins. All access to the application will be password-protected, so that user identity can be established. User ids and passwords will be stored in your application database.

该应用程序将为所有雇员、经理和管理员提供一个入口点(URL)。所有对应用程序的访问都将受到密码保护, 这样用户身份就可以建立起来。用户 id 和密码将存储在你的应用程序数据库中。

For this assignment, you may assume that proper authorization will be added later stage. Therefore, you only need to perform authentication from the main access page, and need not secure access to operations, nor verify authorization for every Web Page Access. This means that it is acceptable that a user is able to bypass the system security by manipulating URLs.

对于这个任务, 你可以假设稍后会添加适当的授权。因此, 您只需要从主访问页面执行身份验证, 不需要安全地访问操作, 也不需要为每个 Web 页面访问验证授权。这意味着用户可以通过操作 url 来绕过系统安全证券。

You can implement the authorization process and claim it as one of your optional features.

Leave Application Submission

您可以实现授权过程, 并将其声明为您的可选特性之一

When an employee (who has already logged in) wishes to submit a leave application, he/she is presented with a leave application form. The Employee fills-in the leave details and submits the form. The system performs validation on the leave details before processing. Details that the form captures minimally include leave period, category of leave, additional reasons, work dissemination (if any) and contact details (if on an overseas trip). The status of application is assigned **'Applied'**.

当一名员工(已经登录)希望提交休假申请时, 他/她会收到一份休假申请表。雇员填写休假细节并提交表格。系统在处理之前对休假细节进行确认。表格中最少包含的详细信息包括休假时间、休假类别、其他原因、工作分配(如果有的话)和联系方式(如果是出国旅行)。申请状态被指定为“申请”。

The Employee could decide to update or delete the leave application before the leave is approved or rejected. In such cases the status is changed to **'Updated'/'Deleted'**. The Employee may also cancel an **'Approved'** leave, in which case the status is changed to **'Cancelled'**.

雇员可以决定更新或删除休假申请之前, 请假被批准或拒绝。在这种情况下, 状态更改为“更新”/“删除”。雇员也可以取消“已批准”的假期, 在这种情况下, 状态改为“已取消”。

The conditions to be checked by application before applying leave includes but not limited to the following:

在申请假期之前，申请人需要检查的条件包括但不限于以下内容：

- Leave period, reason and leave type are mandatory details.
休假期限、理由和休假类型均为强制性细节。
- Dates *From* and *To* in leave period should be in chronologically increasing order.
• 休假期间的起止日期应按时间递增顺序排列。
- Annual leave computation
计算年假
 - If the leave period is ≤ 14 calendar days, weekends / public holidays are excluded.
○ Otherwise, weekends / public holidays are included.
如假期少于 14 个历日，则不包括周末/公众假期。○ 否则，包括周末/公众假期。
 - Each employee is entitled certain number of annual leave based on their designation.
For example, administrative employees receive 14 days annual leave, professional employees receive 18 days annual leave in each calendar year.
○ 每个雇员有权根据他们的指定享有一定数量的年假。例如，行政人员每年有 14 天的年假，专业人员每年有 18 天的年假。
 - *From* and *To* dates must be working days.
○ 从和到日期必须是工作日。
- Medical Leave is limited to 60 days in a calendar year.
每个历年的病假限制为 60 天。

View Personal Leave History and View Leave Application

查看个人休假历史和查看休假申请

An Employee can view all previous leave applications raised by him/her by clicking 'View Personal Leave History'. This page lists leave records pertaining to only the current year. All leave records are shown in tabular form with hyperlinks for detailed view. Upon clicking the individual leave
雇员可点击「查看个人假期记录」，查看他/她以前提出的所有假期申请。这个页面列出了当年的休假记录。所有的休假记录都以表格的形式显示，并附有详细的超链接。点击个人假期

hyperlink, employee can view the complete leave details. He/she can then further update, cancel or delete the application.

超链接，员工可以查看完整的休假详情，然后进一步更新、取消或删除申请。

View Leave Application for Approval and Subordinate Leave History

查看请假申请批准和下级请假历史

Managers can view leave applications raised by his/her subordinates by clicking 'View Leave Application for Approval'. This page shows applications grouped by subordinate name. All leave records are shown in tabular form with hyperlinks for detailed view. Upon clicking the individual leave hyperlink, the manager can view complete leave details.

经理可以通过点击“查看请假申请”来查看他/她的下属提出的请假申请。这个页面显示了按下属名称分组的申请。所有的休假记录都以表格的形式显示，并附有详细的超链接。点击个人休假超链接，经理可以查看完整的休假细节。

He/she can then click **Approve** or **Reject** accordingly along with a Comment. If the leave request is rejected, the manager adds a mandatory comment explaining the decision. To help the manager decide on approval, leave records of his/her subordinates during the leave period are listed. The leave records are assigned '**Approved**' and '**Rejected**' status respectively.

然后，他/她可以点击“批准”或“拒绝”以及相应的“注释”。如果请假被拒绝，经理会添加一条强制性的评论来解释这个决定。为了帮助经理决定是否批准，他/她的下属在休假期间的休假记录被列出来。休假记录分别被分配为“批准”和“拒绝”状态。

Managers can also view complete leave history of his/her subordinates by clicking 'Subordinate Leave History'. This works similar to 'View Personal Leave History'.

管理者也可以通过点击“下属请假记录”查看下属的完整请假记录。这个功能类似于“查看个人休假历史”。

Administration

行政

An Admin must be able to create, modify and delete Employee. He/she must be able to assign, modify roles (employee, admin and manager) of each employee. The admin user will maintain the leave types mentioned earlier and calendar of public holidays for the current year. In addition, admins must be able to enter/update Employee's annual leave entitlements for the current year.

管理员必须能够创建，修改和删除员工。他/她必须能够分配，修改每个员工的角色(员工，管理员和经理)。管理员用户将维护前面提到的休假类型和当年的公共假期日历。此外，管理员必须能够输入/更新员工当年的年假权利。

REST Controller and REST Repository

REST 控制器和 REST 存储库

The team can choose any use case and implement that via **REST Controllers** and **REST enabled Data exchange** on the server side. Also, implement a client-side technology to consume the same API End Points.

团队可以选择任何用例，并通过 REST 控制器和在服务器端启用 REST 的数据交换来实现。同时，实现客户端技术来使用相同的 API 端点。

Scope

范围

The minimum number of use cases (or features) per team is x plus login and logout features, where $x = \text{team size} * 2$. For example, the minimum number of features is 10 for a team of 5 members, plus login and logout functions. The selected features must include significant functions for the leave application.

每个团队用例(或特性)的最小数量是 x 加上登录和注销特性, 其中 $x = \text{团队规模} * 2$ 。例如, 一个 5 人团队的最小功能数是 10 个, 再加上登录和注销功能。所选择的功能必须包括休假申请的重要功能。

Optional Features (for additional marks)

可选功能(用于附加标记)

Compensation Leave Management

补偿假期管理

Employees are allowed to claim compensation for overtime work, in a granularity of half a day. This claim is subject to manager's approval. Each employee has an associated ledger to keep track of compensation leave and respective claim day. When the employee claims to use his compensation leave, it is again approved/rejected by the managers.

员工可以以半天的粒度要求加班费。这种索赔需要经理的批准。每个员工都有一个相关的账本来记录补偿假和相应的索赔日。当员工要求使用他的补偿假时, 经理会再次批准或拒绝。

Reporting

报告

Managers must be able to produce various reporting views such as
管理人员必须能够产生各种报告视图，如

- Employee on annual/compensation/medical/all leave during a selected period.
员工在选定期间的年度/薪酬/医疗/所有休假。
- Compensation claims for all/particular employee.
所有/个别雇员的补偿申索。
- Managers must be able to export the above reports to comma-delimited (CSV) file format.
管理者必须能够将上述报告导出为逗号分隔(CSV)文件格式。

Movement Register

行动登记册

This is a menu available for all users and upon clicking the hyperlink, the system displays details of all employees on leave during the current month and the category of leave. Users can also navigate to the previous and next month using a dropdown choice list.

这是一个面向所有用户的菜单，点击超链接后，系统会显示当月所有休假员工的详细信息以及休假类别。用户也可以使用下拉菜单导航到上个月和下个月。

Pagination

分页

If many leave results are returned (say more than 30 records), the system should present them over several pages. Each page will contain navigation facilities so that other pages of search results can be shown (similar to search engine results). The number of results per page should ideally be selectable by the user (e.g. 10, 20, 25).

如果许多休假结果被返回(比如超过 30 条记录)，系统应该在几个页面上显示它们。每个页面将包含导航设施，以便其他页面的搜索结果可以显示(类似于搜索引擎的结果)。理想情况下，每个页面的结果数量应该是用户可以选择的(例如 10,20,25)。

Email interaction

电子邮件互动

When the employee applies for leave, system should send a notification email to his/her manager. Also, the employee is informed of results on both accept and reject cases. The email message should contain a direct link to the login page where the user can view the comments.

当员工申请休假时，系统应该向他/她的经理发送通知电子邮件。同时，员工会被告知接受和拒绝案件的结果。电子邮件信息应该包含一个直接链接到用户可以查看评论的登录页面。

ReactJS client

反应客户

Implement one or two use cases with ReactJS app, consuming the REST APIs.

使用 ReactJS 应用程序实现一两个用例，使用 REST api。

Secure the application using Spring Security

使用 Spring 安全证券保护应用程序

Any other interesting extensions the team can think of creatively would be highly appreciated
团队创造性地想到的任何其他有趣的扩展都会受到高度赞赏

Software development tools

软件开发工具软件开发工具

Technology 技术	Tool 工具 Name 姓名	Details 详细信息
Java SE Java 语言	JDK JDK	You can download a copy online 你可以在线下载一个拷贝
Spring Framework Spring 框架	STS STS	You can download a copy online 你可以在线下载一个拷贝
ReactJS ReactJS	Visual Studio Code Visualstudio 代码	You can download a copy online 你可以在线下载一个拷贝
Database 数据库	JPA JPA (JPA)	Preferably MySQL Database 最好是 MySQL 数据库

Design Consideration

设计考虑

The following are the system design consideration.

以下是系统设计考虑事项。

- The systems are developed using Spring components.
系统是使用 Spring 组件开发的。
- The system uses Database to store the data. Do design appropriate data scripts and also populate the database with sufficient test data.
系统使用数据库存储数据。设计合适的数据脚本，并且用充足的测试数据填充数据库。

Evaluation Criteria

评估标准

Everybody contributes and no excuses. You will be assessed both in team and individually.
每个人都做出了贡献，没有任何借口。你将在团队和个人中被评估。

The team will be evaluated on the **technical aspects** and **user -friendly aspects** of the application deliverable. Beyond the working solution, some expectations would be:
团队将在技术方面和应用程序交付的用户友好方面进行评估。在工作解决方案之外，还有一些期望值：

- Implementation **best practices**; for example, object encapsulation, layering of architecture etc.
实现最佳实践; 例如，对象封装、体系结构分层等。
- Proper **exception handling** implementations, server validation logic, test cases and utility classes.
适当的异常处理实现，服务器确认逻辑，测试用例和实用程序类。
- User Interface (**UI**) and User Experience (**UX**).
用户接口(UI)和用户体验(UX)。
- **Quality of the presentation**, including presentation scripts, timing, clarity, etc.
演示的质量，包括演示脚本，时间，清晰度等。

Deliverables

交付成果

This assignment is part of the continuous assessment for this course. You will be evaluated for **30 marks** on the whole.

这项作业是本课程持续评估的一部分。你们将被评为 30 分。

You will work in your team. No individual work will be accepted.
你将在你的团队中工作。没有个人的工作将被接受。

The followings are the deliverables:

以下是可交付成果:

- **A video**, maximum 30 mins, including:
录影带，最长 30 分钟，包括：
 - Demonstrating how the users use your system.
演示用户如何使用你的系统。
 - Showing the functionalities and important business logics **working properly**.
显示正常工作的功能和重要业务逻辑。
 - Explanation of **ER Diagram** and **highlighting of design choices** if any.
解释 ER 图，突出显示设计选择。
 - **Highlighting** the main / **interesting designs** and **codes** of your teamwork.
强调团队合作的主要/有趣的设计和代码。
- A simple 6 pointer **presentation slides**, mentioned at the **end** of the video, covering the following details is appreciated:
一个简单的 6 指针演示幻灯片，在视频的最后提到，涵盖了以下细节是值得赞赏的：
 - Your team number and members (title slide).
您的团队编号和成员(标题幻灯片)。
 - Explanation of how the Team carried work distribution.
解释团队如何进行工作分配。

- Explanation of Architecture/Layer Description/Any other additional dependencies used.

解释架构/层描述/使用的任何其他附加依赖项。

- Explanation of Class Diagram or ER Diagram.

解释类图或 ER 图。

- Explanation of Technologies Used.

所用技术的解释。

- Summary of lessons Learnt.

学到的经验总结。

- Your project **source codes:**

您的项目源代码:

- Java codes.

Java 语言代码。

- React.JS codes (if any).

React.JS 代码(如果有的话)。

- A readme.txt, instructing how to run your project **locally**.

一个 readme.txt, 指导如何在本地运行项目。

