

**1. (2 pts) Problem definition: outline the problem requirements and include the application domain and motivations of your project (1 page).**

- Problem Definition: Develop a software that easily connects developers that have the same interest in working on the same project and be able to group up to work towards the same goal.
- Problem Requirements: Dev2Friend aims to solve the problem of difficulty finding a group of developers to work with that has similar experiences, similar familiarity with several programming languages and other technologies, and a group of people that has the same interest in solving a specific problem.
- Application domain: Dev2Friend mainly is a social networking site, a social media platform, and a project distribution platform. It focuses on networking and connecting developers all around the world.
- Motivation: As developers, we try to find a problem and try to solve them by creating a software that makes any functionalities easier, faster, and efficient. Therefore, we as a group found a problem that some students from our CS 476 class had difficulty finding a group to work with. Dev2Friend's main goal is to automate group pairing for students that have the same experience in the same programming languages and technologies, and for students that have the same goal and interest in solving the same problems. This software connects developers fast and its functionalities lets the user interact with other developers that have similar interests (similar to the "People You May Know" functionality on Facebook). Dev2Friend can be used for future students in order to find a group early in a semester which gives them a head start in working towards a project.

**2. (4 pts) Application benefits (2 pages): what are the benefits of your application when compared to existing systems. Choose two systems only and include their references.**

- LinkedIn & ZipRecruiter
  - Dev2Friend's main goal is to help students and developers team up to design and develop software that can be implemented as a real-world application.
  - Dev2Friend offers project ideas that developers would have to solve in order to implement the best high-quality application there is. In addition, our software also allows students and developers to contribute problem ideas that would deem beneficial to users—
  - Allow users to customize the page color according to their liking, update and show project progress, show current tasks and group members.
  - Unlike LinkedIn and ZipRecruiter which connect people to their next opportunity, Dev2Friend focuses solely on connecting students or developers with similar interests into creating a project that is aligned with their specific concern or idea,

where both can create an environment for understanding and increase productivity.

**3. (4 pts) Functional requirements list (only the ones that you have implemented) for each user role (two exactly). Name each requirement and explain it briefly**

**Role: User**

**Functional Requirements**

- **Create Profile**
  - Profile attributes should contain the user's profile picture (optional), name (required), username (required), password (required), date of birth (can be hidden and required), e-mail (can be hidden and required), language proficiencies (optional), resume (optional), previous & current projects (can be hidden and optional)
- **List Project**
  - The user should be able to list a project that other users are able to interact with, barring any preconditions connected to the listing (personal, delisted, closed, invite only, limited members, etc.)
- **Project View**
  - The user should be able to browse through a list of currently active / listed projects. They should also be able to join / leave any project barring any preconditions connected to the listing (closed, invite only, limited members, invite only etc.)
  - Based on the visibility preferences set by the original author, users should be able to search for the listing
  - The original Author should have the capability to add tags to the project that specifies the type of listing it is i.e. (personal, open / closed, limited membership, invite only etc.)
  - The project can have a number of different tags that serve to help users identify the type of project / group they are searching for, this includes:
    - § **Personal** – this tag identifies the project as a personal project and will not be listed on the project page.
    - § **Open** – this tag identifies that the project is open for anyone who wants to contribute to the project.
    - § **Closed** – this tag identifies that the project has concluded, and no more members can join.
    - § **Invite only** – this type of tag is similar to limited membership as the maximum number of members is controlled by the original author of

the project. This type of project requires an invite to be sent out to the user.

- **Project Description**

- Each project listing should include a brief summary of the project as well as the goal of the project.
- **Language requirements**
  - § The project should include the type of language the project is using i.e., (C++, HTML, JavaScript, Python etc.)
- Identifying tag
- Member count

- **Search Function**

- The user should be able to search for another user / project / group by using filters or keying in search terms related with the search query
  - § Filter includes:
    - § **Languages**
      - § C++ / C / C#
      - § HTML / CSS
      - § JavaScript
      - § Python etc.
    - § **Type of project**
      - § Limited members,
      - § Invite only,
      - § Open,
      - § Closed (this only refers to the projects that have not been delisted)

**Role: Admin**

// The admin will have all capabilities of a normal user with some additional privileges including but not limited to //

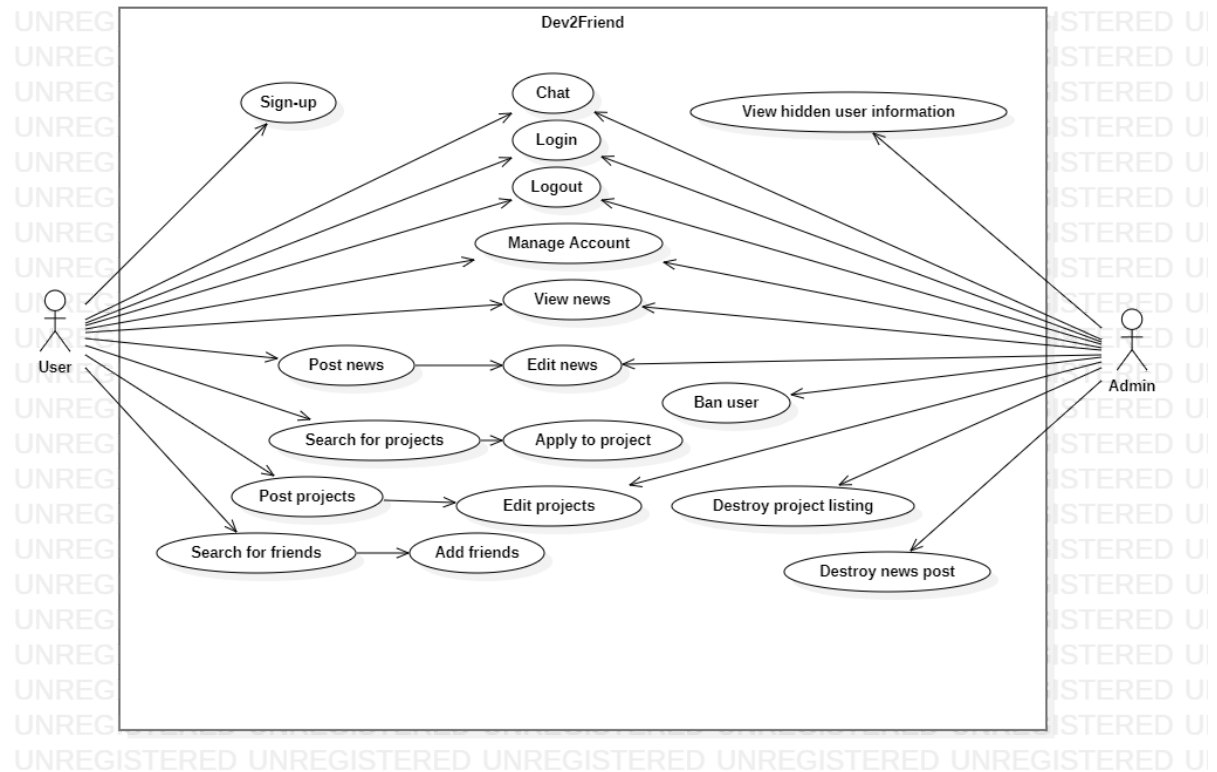
- **Profile management**

- The admin has the ability to ban / unban any user profile for any period of time if the circumstances i.e.,(use of objectionable language, threats of any kind, hate speech, etc.) require this type of action
- The admin should be able to view relevant information about the user, (search history, comments, engagement with other accounts) – this information is only relevant for D2F

- **Project list Management**

- The admin is able to delist / re-enlist projects if the circumstances require this type of action

**(b)3+3 pts) For each user role, provide the use case diagram with all the use cases and actors.**



**(c) (3+3 pts) Describe in detail two use cases using the activity diagram. Choose the most complex use cases.**

Example 1

- The user signs up for Dev2friend
- The user searches for projects
  - The user applies to a project
- The user adds others in the project to their friends list
- The user creates a news post about joining a new project

Example 2

- The user signs up for Dev2friend
- The user creates a project listing
  - The project listing contains inappropriate language
- An admin is notified of the inappropriate language
- The admin edits the project listing to correct the language
- The admin issues a warning to the user via the chat function

**(d) (6 pts) Software qualities: Correctness, Time-efficiency, and Robustness. Include at least two concrete examples for each quality for each user role. The sign-in and sign-up use cases are excluded from the examples.**

**User:**

Correctness

- 1) When creating a project, the system should ensure that the user provides accurate and complete information, such as a project title and description
- 2) When providing known languages the system could have the user select from a predefined set

Time-efficiency

- 1) When listing projects, the system will allow the user to filter results based on different criteria such as project name, date added, required language, etc
- 2) When listing projects, the system will load and display quickly and efficiently

Robustness

- 1) The system will detect errors and provide clear feedback during the project creation process.
- 2) The system will be able to detect if a project listing has been destroyed and notify relevant users.

**Admin:**

Correctness

- 1) When banning a profile, the system will ensure the profile exists and has not already been banned.
- 2) When banning a profile, the system will log the action and the reason for the ban to ensure accountability and transparency.

Time-efficiency

- 1) When destroying a project listing, the system should remove any associated data such as project files.
- 2) The system will allow Admins to perform bulk actions, such as banning multiple profiles at once.

Robustness

- 1) When banning a profile, the system should ensure that the ban is effective across all relevant parts of the application.

- 2) When destroying a project listing, the system should verify that the admin has the necessary permissions to perform the action.

**4. (29 pts) Top-level and low-level software design:**

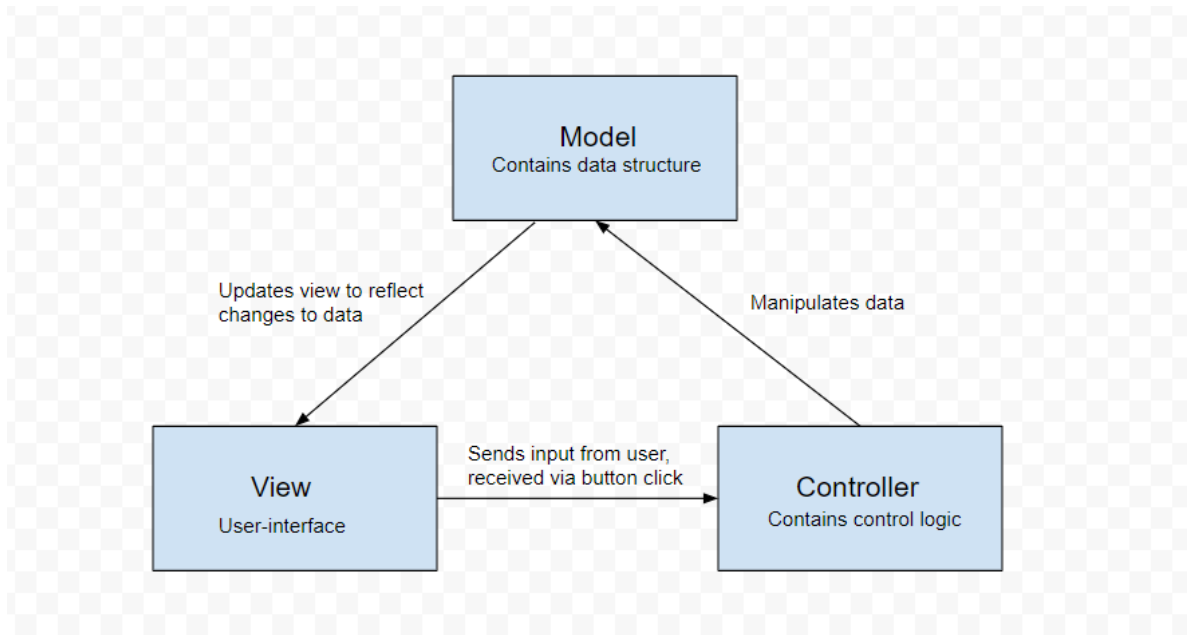
**(a) (5+3 pts) Provide the MVC architecture according to the selected Web framework.**

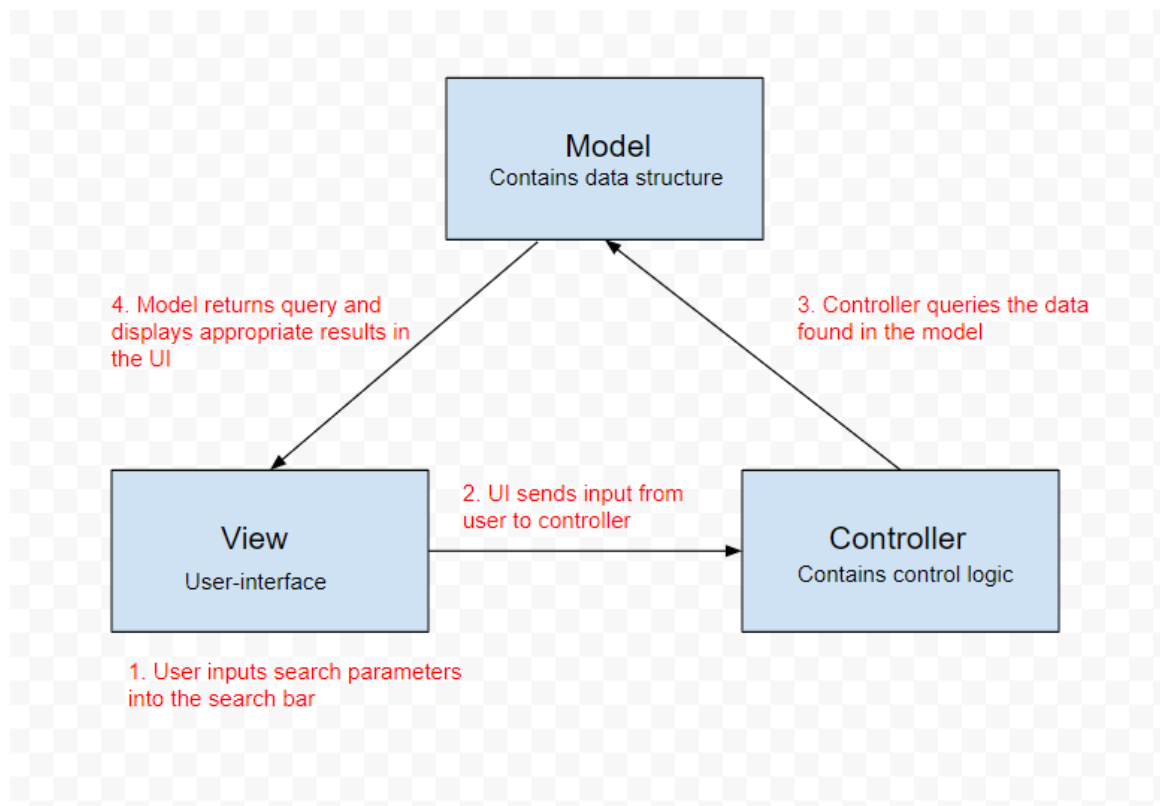
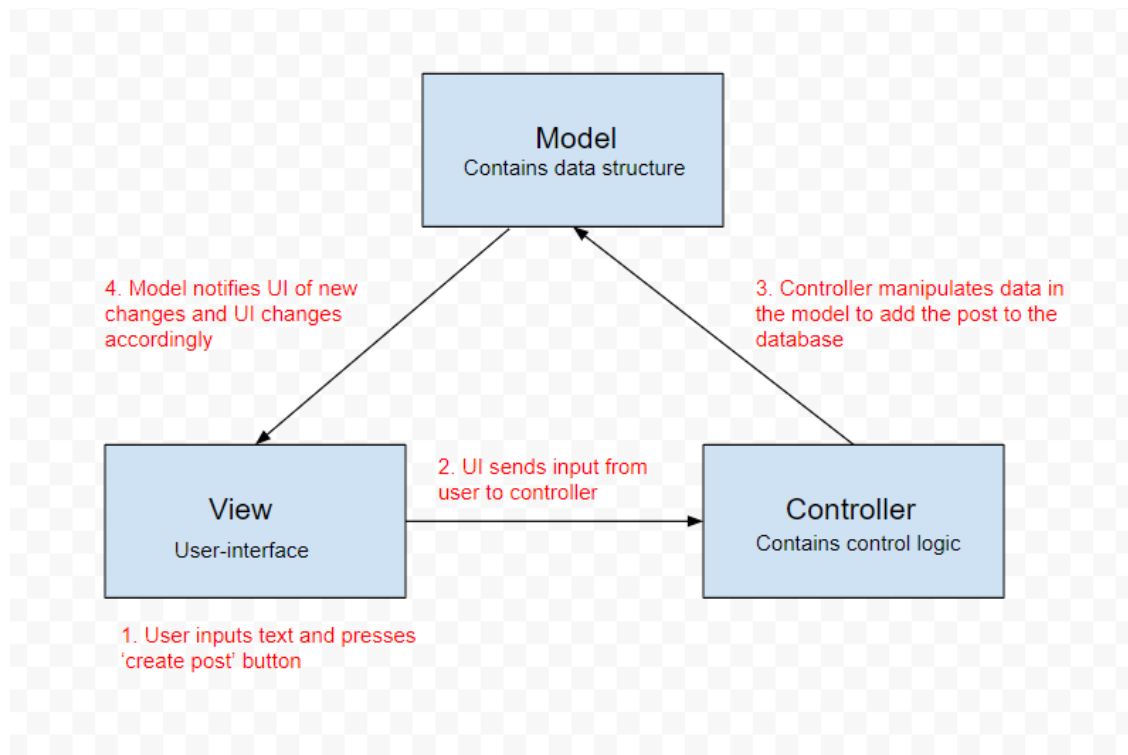
**Also, describe at least three benefits of MVC for your application.**

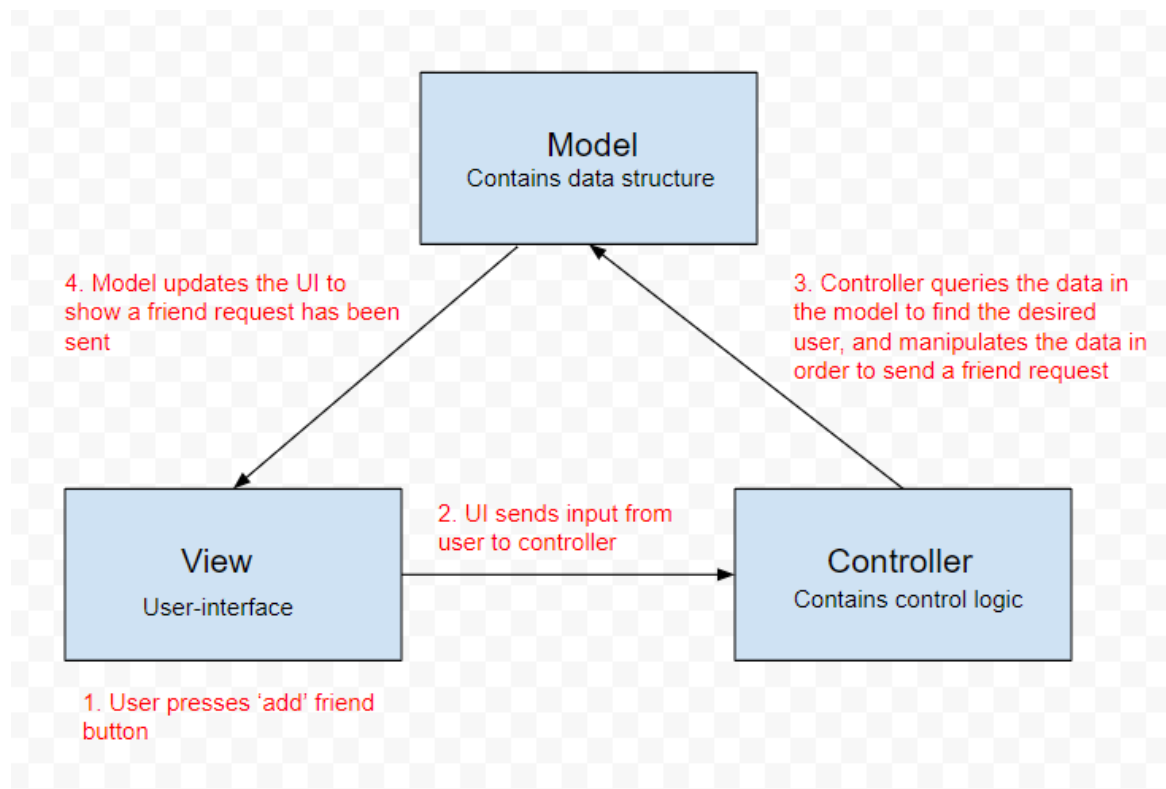
Ruby on rails?

ASP.NET

- Might be a safer bet because discussed in class





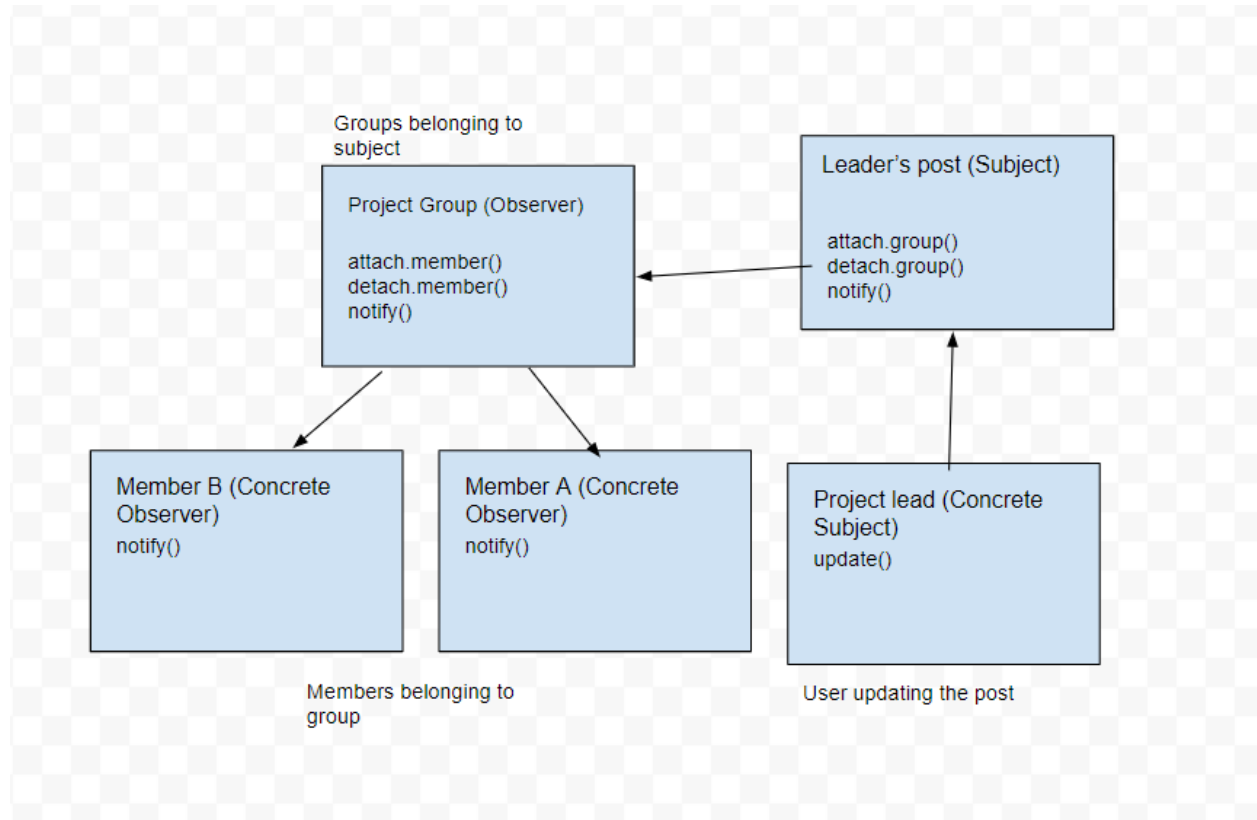


#### MVC benefits

- Accelerated development
- Can develop multiple views for the website
  - Mobile view
  - Webpage view
  - etc
- Modifications do not affect the entire project
  - Modifications can be made to small parts of the project w/o affecting the entire project as a whole
    - Beneficial for developing different aspects of the website asynchronously



(b) (8+8 pts) Observer and Factory design patterns. Explain in detail the usability of these two patterns for your specific application. Include the complete class diagram for each pattern. Also provide the algorithms corresponding to the pattern's important methods. For each class, provide the data types of the attributes and prototypes of the methods.



(c) (5 pts) Provide the class diagram of the whole system by incorporating the two design patterns.

### Three Tabs

- Newsfeed view
  - Urgent questions chat window
- Personal progress view
- Project finding view

When you add a language to your account, the option to be added to a help channel

Newsfeed/Personal view

Project finding

Create an account page

Profile view