**DESIGN PROBLEM: M.U.D. v2.0**

Unless otherwise specified, version 2.0 of the application is required to meet all of the functional and non-functional requirements of v1.0 in addition to the new requirements outlined below.

## Functional Requirements

1. Users that are not authenticated may choose to browse (but not to play) any premade map (see "premade map" mode below).
   1. They will be able to navigate from room to room by indicating in which direction they would like to move. If there is a door in that direction, the display will update to display the next room.
   2. When a room is displayed, it will only include contents stored in the persistent map. Any dynamic content need not be generated or displayed.
2. The system shall support multiple registered users.
   1. Each user will register with a username and password.
   2. The system will persistently store the user's profile including:
      1. Username/password
      2. The number of games played.
      3. The number of lives lost.
      4. The number of monsters slain.
      5. The total amount of gold earned.
      6. The number of items found (weapons, armor, buffs).
   3. Once authenticated, users may:
      1. Change their password.
      2. View their history.
      3. Resume a game in progress.
      4. Start a new game (this ends any games currently in progress).
      5. Join an "endless adventure" game that is currently in progress with one or more other players (see below).
3. The system shall support two different game modes: "premade map" and "endless adventure."
4. When choosing to play "premade map" mode:
   1. The user must be given a list of maps from which to choose.
   2. At a minimum, the map's configuration of rooms must be pre-determined, including the location of the start and goal rooms, as well as doors connecting rooms together.
   3. The contents of each room (tiles, obstacles, monsters, etc.) may be dynamically generated as the game is played.
   4. The game ends when the player reaches the goal, at which point their history is updated with the stats for the game (monsters slain, gold earned, etc.).
5. When choosing to play "endless adventure" mode:
   1. The user may choose to start a new game or join a game in progress (if one exists).
   2. The map is procedurally generated and is effectively infinite - there is no goal.
   3. Each player that joins the adventure will be assigned a "start" room that is unique to them and connects to one of the unexplored doors on the map. Start rooms are always "safe" areas that contain a merchant and a shrine (see below).
   4. If/when the player returns to their own starting room, they are given the option to end the game. If they choose to end the game, their history is updated with the stats for the game (monsters slain, gold earned, etc.). This does not end the game for any other players.
   5. Any slain monsters will respawn after the player has traveled through 5 rooms. Respawned monsters do not need to be the same as those that they are replacing.
   6. Periodically (about 1 in 10 rooms) the player will encounter a shrine (see shrines below).
   7. The player may choose to save and exit at any time.
   8. If the player is defeated without praying at a shrine, the game ends. This does not end the game for any other players.
   9. Should a player encounter another player's corpse, they may loot any items or gold.
6. A shrine is a new kind of tile that meets the following requirements:
   1. Shrines will only appear in "endless adventure" mode.
   2. If the player defeats all monsters in the room, they will have the option of praying at the shrine.
   3. If the player dies, they will travel back in time to the moment at which they prayed to the last shrine.
   4. Any changes to the state of the player or the game that have occurred since that time will be lost (including any monsters that were slain).
   5. The snapshot of the game created when praying at a shrine is not stored persistently - praying at a shrine does not change the player's saved game!
   6. The player's shrine status is lost if they exit the game - they will need to seek out another shrine.
7. A merchant is a new kind of tile that meets the following requirements.
   1. Merchants may appear in "endless adventure" or "premade map" modes.
   2. Merchants in "safe" rooms (e.g. the player starting location) are always "open."
   3. Merchants in other rooms are "closed" during the night and/or when any monsters are in the same room.
   4. The player may sell any items in their possession in exchange for half of the item's value in gold.
   5. The merchant will offer a set of 3 random items for sale to the player in exchange for the item's value in gold.
   6. The merchant may sell any kind of item including weapons, armor, buffs, and bags.
8. The user may export/import their profile and any games in progress to any of the following formats. Each user may opt to use any of the supported formats each time they export/import.
   1. CSV
   2. JSON
   3. XML

## Non-Functional Requirements

1. This version of the application must provide a graphical user interface (GUI) through which a user may interact with the application using controls such as buttons and menus.
2. users play one at a time - there is no requirement to support multiple, concurrent players in the game.
3. While this version of the application need only export to/import from files, future versions of the application will require the ability to save to or load from a real database (such as MySQL, PostgreSQL, Oracle, etc.).