| **Component** | **Input** | **Process** | **Storage** | **Output** |
| --- | --- | --- | --- | --- |
| User Authentication | User inputs (username, password) | Hashing passwords, verifying user credentials | SQLite database (mazes.db), users table | Confirmation of login, error messages |
| Maze Generation | User inputs for maze properties (height, width, maze type) | Generating maze using algorithms (Prim’s and Recursive Backtracker), validating maze paths | SQLite database, mazes table | Visual representation of maze, messages for generation success/failure |
| Maze Rendering | Maze data (2D array) | Rendering maze cells on canvas | - | Visual display of maze on GUI |
| Path Finding | Maze data, start and end points | A\* search algorithm to find path | - | Path shown on the maze |
| Database Operations | SQLite commands, user and maze data | Creating, reading, updating & deleting database records | SQLite database (mazes.db), users and mazes tables | Confirmation of database operations |
| User Interface Events | User interactions with GUI (buttons, forms) | Handling UI events, showing/hiding forms and windows | User inputs stored temporarily in variables | Dynamic changes in UI based on user actions |
| Admin Console | Admin credentials, admin commands | Managing users, displaying user data | SQLite database, users table | Admin panel UI with user management options |