

Object-Oriented Programming

Semester 2025 II

Domotic Circuit Simulation

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CRC Cards

Our Domotic Simulator Circuit will have, or be based on, the next CRC Cards:

| User | |
|--|---|
| <ul style="list-style-type: none">- Log in with username and password.- Manage saved projects.- Access the main simulator interface. | <ul style="list-style-type: none">-Project Manager-UI Controller |

| Project Manager | |
|--|--|
| <ul style="list-style-type: none">- Create, save, open, and delete projects.- Manage auto-save and automatic recovery.- Export and import circuit designs. | <ul style="list-style-type: none">-User-Circuit Board-File Handler |

| File Handler | |
|---|--|
| <ul style="list-style-type: none">- Read and write project files.- Handle file formats (.json, .xml, .cir).- Validate the structure and integrity of stored data. | <ul style="list-style-type: none">-Project Manager |

| UI Controller | |
|---|--|
| <ul style="list-style-type: none">- Capture and interpret user actions (mouse, keyboard, drag & drop).- Coordinate communication between UI, components, and simulation.- Update circuit visuals and measured values. | <ul style="list-style-type: none">-User-Component-Circuit Board-Monitor |

| UI Manager | |
|---|---|
| <ul style="list-style-type: none"> - Display the graphical interface (buttons, menus, workspace). - Render components and their states. - Receive updates from UIController. | <ul style="list-style-type: none"> -UIController -Component -Monitor |

| Component | |
|---|--|
| <ul style="list-style-type: none"> - Store electrical properties (resistance, voltage, current, type). - Allow operations: move, rotate, duplicate, delete, rename. - Detect and manage connection points. | <ul style="list-style-type: none"> -Circuit Board -UI Controller |

| Component Library | |
|---|--|
| <ul style="list-style-type: none"> - Store all available component types (resistors, sensors, relays, microcontrollers, etc.). - Allow search and drag of components into the board. - Define default properties for each component. | <ul style="list-style-type: none"> -UI Controller -Component |

| Connection | |
|---|--|
| <ul style="list-style-type: none"> - Represent a link between two components. - Verify connection validity and continuity. - Transmit electrical values between nodes. | <ul style="list-style-type: none"> -Component -Circuit Board |

| Circuit Board | |
|--|---|
| <ul style="list-style-type: none"> - Manage the layout and placement of components. - Handle all electrical connections. - Validate circuit rules and constraints. - Send data to the simulation engine. | <ul style="list-style-type: none"> -Component -Connection -Simulation Engine -Monitor |

| Monitor | |
|---|---|
| <ul style="list-style-type: none"> - Display the simulation results in a table format. - Let the user select measurement nodes. - Show voltage or power variations in real time. | <ul style="list-style-type: none"> -Simulation Engine -Circuit Board - UI Controller |

| Simulation Engine | |
|---|--|
| <ul style="list-style-type: none"> - Calculate electrical values (voltage, current, power) in real time. - Detect invalid or incomplete connections. - Send simulation results to the monitor. | <ul style="list-style-type: none"> -Circuit Board -Monitor |

| Setting Manager | |
|--|---|
| <ul style="list-style-type: none"> - Manage user preferences (language, theme, auto-save time, grid size). - Load settings at startup. - Update settings dynamically. | <ul style="list-style-type: none"> -UI Manager -Project Manager |

| Help System | |
|--|---|
| <ul style="list-style-type: none"> - Provide tooltips or explanations about each component. - Display quick help or tutorial windows. - Integrate context-sensitive help in the UI. | <ul style="list-style-type: none"> -UI Manager -Component Library |