

## **UNO Flip – User Manual**

### **Milestone 1**

The project began as a basic text-based UNO game. Everything happened in the console, and the GameFlow class managed all turns, rules, and printed messages. This worked for the simple version but was hard to expand because all the logic was in one place.

### **Milestone 2**

For this milestone, The game moved to a proper MVC structure so it could work with the GUI. GameFlow was removed, and UnoModel took over the game logic. UnoController handled button actions, and UnoFrame displayed the GUI. Enums were added for colours and values, and the Player class was updated so each player managed their own cards. The model used observer updates to refresh the GUI. This milestone also introduced AI players that make legal moves, draw when needed, and prefer special cards.

### **Milestone 3**

UNO Flip mechanics were added. These include the Flip card, Draw Five, Skip Everyone, and Wild Draw Colour. The scoring system was updated for Flip rules, and the deck switches between the light and dark side. The AI logic was also updated so it could handle both sides. UML class diagrams and sequence diagrams were changed to include the new Flip features.

### **Milestone 4**

Replay, undo/redo, and save/load features were added. Players can now start new rounds after someone wins, and a full new game starts when someone reaches 500 points. Undo and redo allow players to move backwards or forwards through the game state, and multiple levels are supported. Serialization lets users save the game and load it later. Only the model is saved, and the GUI rebuilds itself when loading. UML diagrams and sequence diagrams were updated again, and new JUnit tests were added for undo/redo and save/load.

### **How to Run the Game**

- Make sure you have Java 17 or higher installed.
- Download the SYSC3110\_M4\_Uno.jar file.
- Double-click the file to run it.  
If it doesn't open, use the terminal:  
`java -jar SYSC3110_M4_Uno.jar`
- The GUI will open, and you can choose Human or AI players.

### **How to Play**

- Click a playable card to use it.
- If you cannot play, click Draw.
- After your move, click Next Player.
- The GUI blocks illegal moves automatically.

### **Special Cards Included**

- Light Side (Original UNO)
- Draw One
- Reverse

- Skip
- Wild
- Wild Draw Two

### **Dark Side (UNO Flip)**

- Flip
- Draw Five
- Skip Everyone
- Wild Draw Colour

### **AI Behaviour**

- Only plays legal cards
- Prefers special cards when possible
- Draws when no legal cards exist
- Picks colours based on what it has most

### **Undo / Redo**

- Undo takes you back one or more moves
- Redo the replays moves you undid
- The game state updates instantly

### **Replay System**

- After a round ends, scores update
- A new round begins with the same players
- When someone reaches 500 points, the full game ends, and you can start a new one

### **Save / Load**

- Press Save to store your game
- Press Load to reopen it later
- Only the model is saved
- The GUI rebuilds itself when loading
- Errors (like missing files) are handled safely

