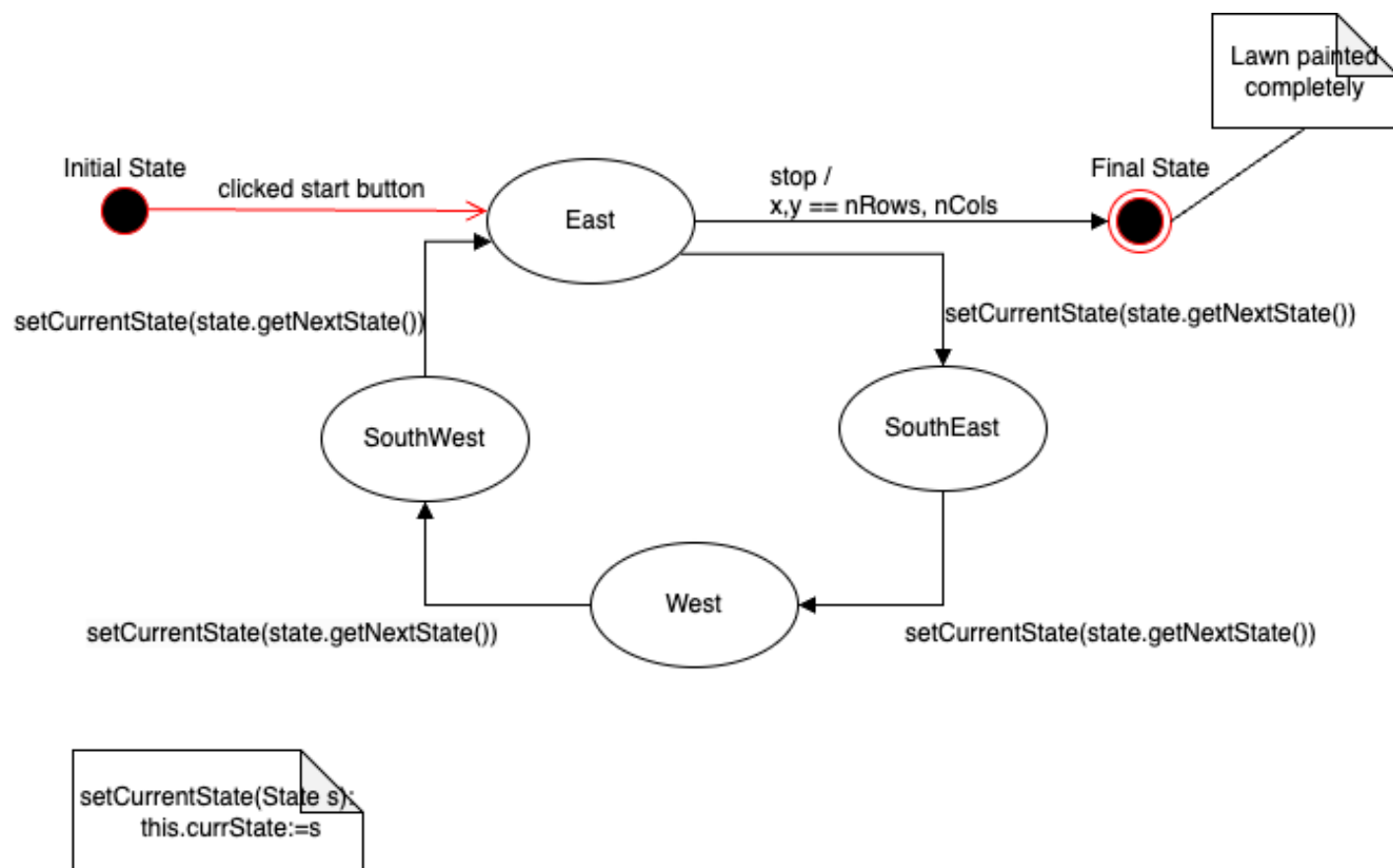Soham Balkothe
Student Id - 1001500980
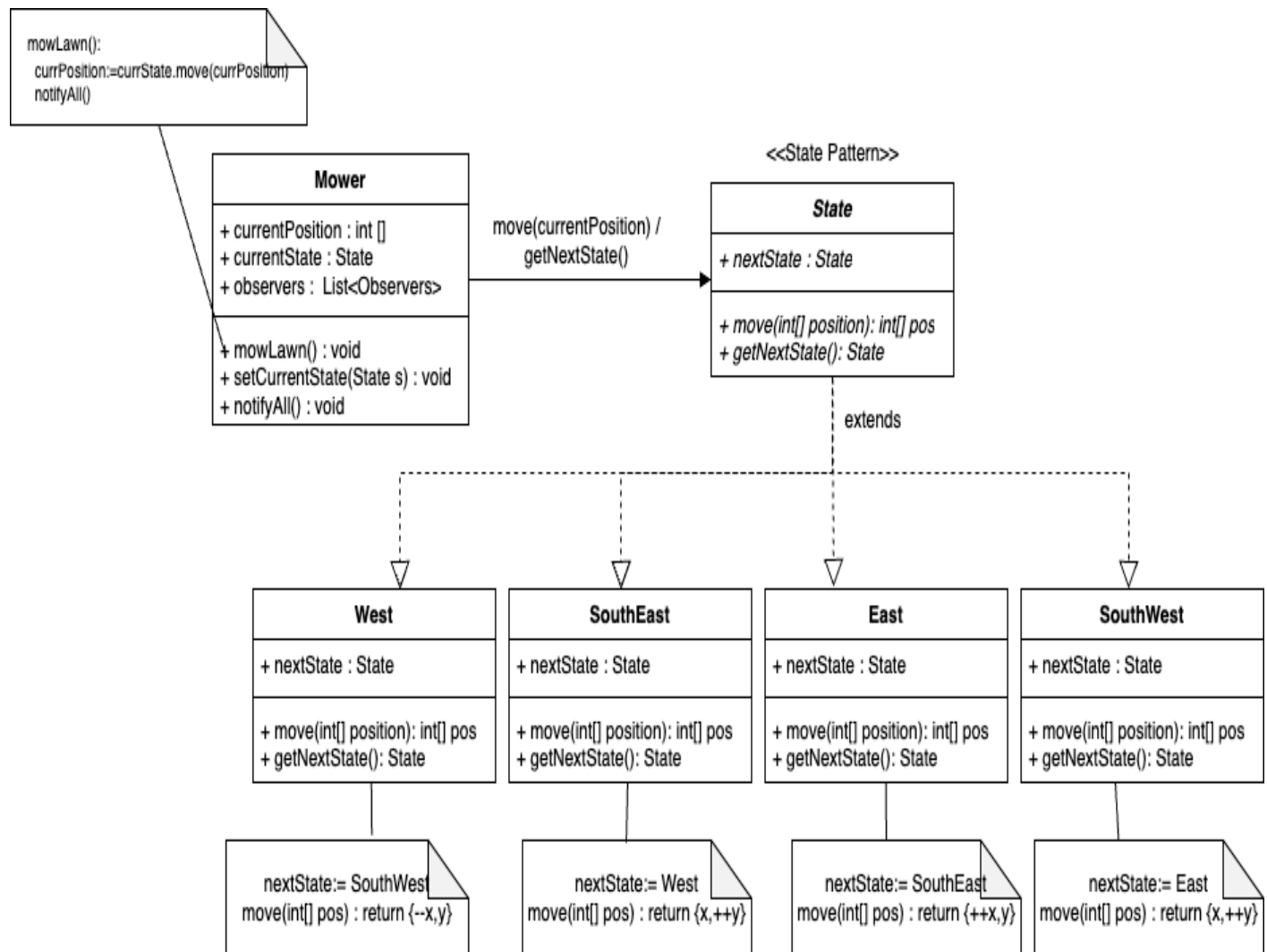Email - svb0980@mavs.uta.edu

CSE 5322 : Software Design Patterns
Homework 4

If the diagrams attached below might not be clearly visible due to space issue, I have added them in the **Diagrams** folder.
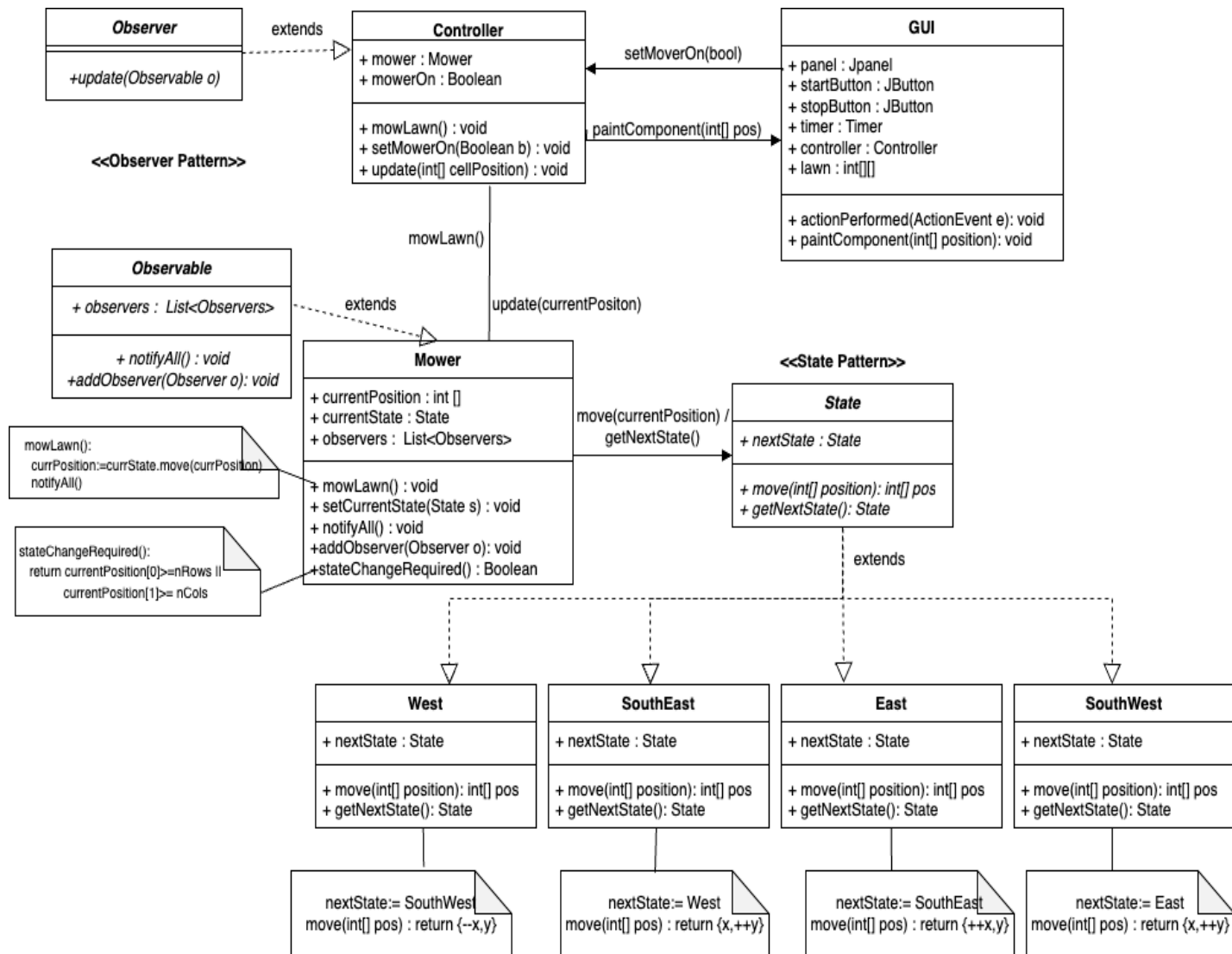
1. State Machine Diagram

2. Class Diagram for the state machine

mowLawn():
  currPosition:=currState.move(currPosition)
  notifyAll()

Mower

+ currentPosition : int []
+ currentState : State
+ observers : List<Observers>

+ mowLawn() : void
+ setCurrentState(State s) : void
+ notifyAll() : void

move(currentPosition) /
getNextState()

<<State Pattern>>

State

+ *nextState : State*

+ *move(int[] position): int[] pos*
+ *getNextState(): State*

extends

West

+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

SouthEast

+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

East

+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

SouthWest

+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

nextState:= SouthWest
move(int[] pos) : return {--x,y}

nextState:= West
move(int[] pos) : return {x,++y}

nextState:= SouthEast
move(int[] pos) : return {++x,y}

nextState:= East
move(int[] pos) : return {x,++y}

3. State Diagram

Observer

+update(Observable o)

extends

Controller
+ mower : Mower
+ mowerOn : Boolean

+ mowLawn() : void
+ setMowerOn(Boolean b) : void
+ update(int[] cellPosition) : void

<<Observer Pattern>>

setMoverOn(bool)

GUI
+ panel : Jpanel
+ startButton : JButton
+ stopButton : JButton
+ timer : Timer
+ controller : Controller
+ lawn : int[][]

+ actionPerformed(ActionEvent e): void
+ paintComponent(int[] position): void

paintComponent(int[] pos)

Observable

+ observers : List<Observers>

extends

+ notifyAll() : void
+addObserver(Observer o): void

mowLawn()

update(currentPositon)

mowLawn():
currPosition:=currState.move(currPosition)
notifyAll()

Mower
+ currentPosition : int []
+ currentState : State
+ observers : List<Observers>

+ mowLawn() : void
+ setCurrentState(State s) : void
+ notifyAll() : void
+addObserver(Observer o): void
+stateChangeRequired() : Boolean

move(currentPosition) /
getNextState()

<<State Pattern>>

State

+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

stateChangeRequired():
return currentPosition[0]>=nRows ||
currentPosition[1]>= nCols

extends

West
+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

SouthEast
+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

East
+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

SouthWest
+ nextState : State

+ move(int[] position): int[] pos
+ getNextState(): State

nextState:= SouthWest
move(int[] pos) : return {--x,y}

nextState:= West
move(int[] pos) : return {x,++y}

nextState:= SouthEast
move(int[] pos) : return {++x,y}
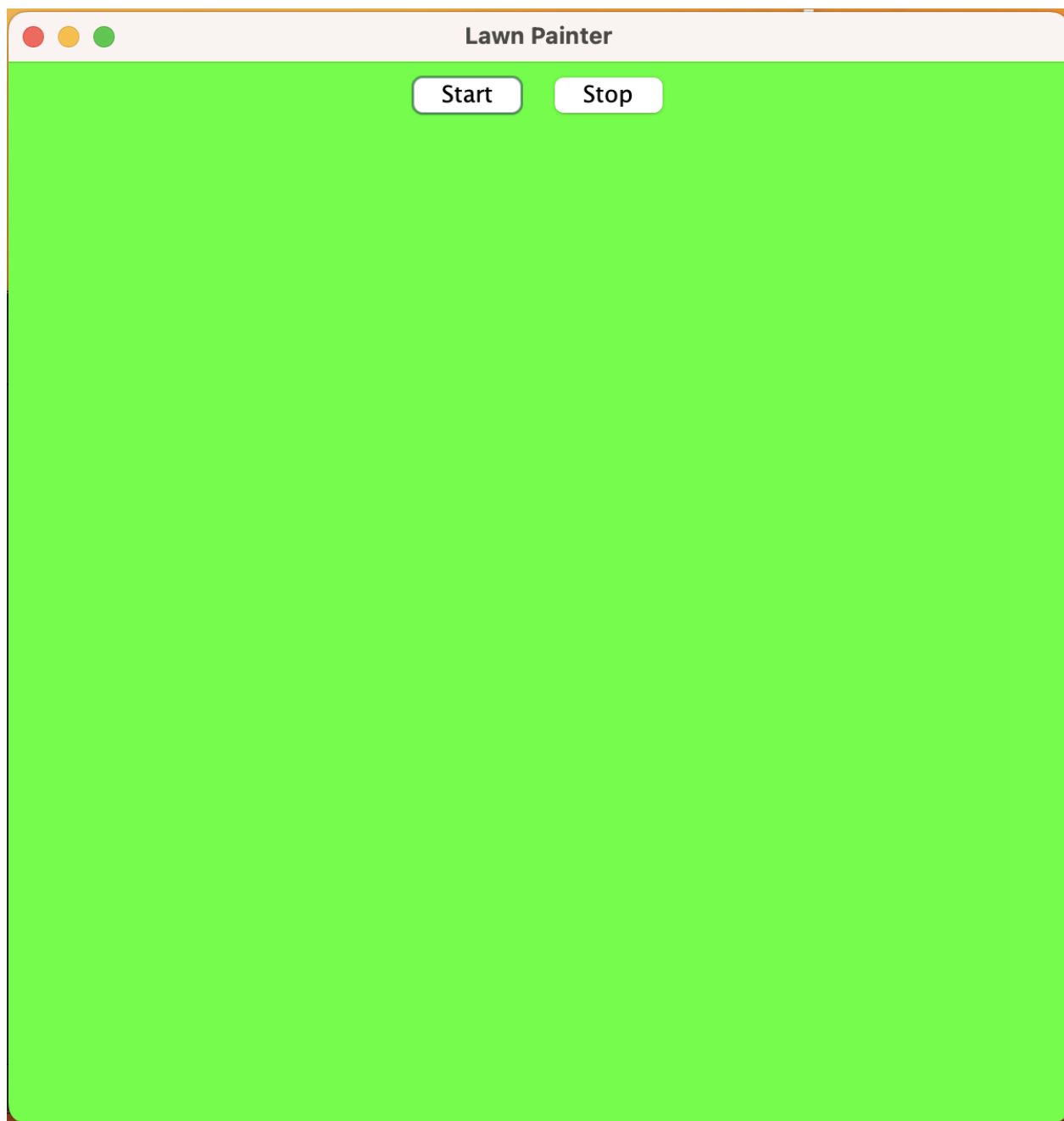
nextState:= East
move(int[] pos) : return {x,++y}

4. Implementation
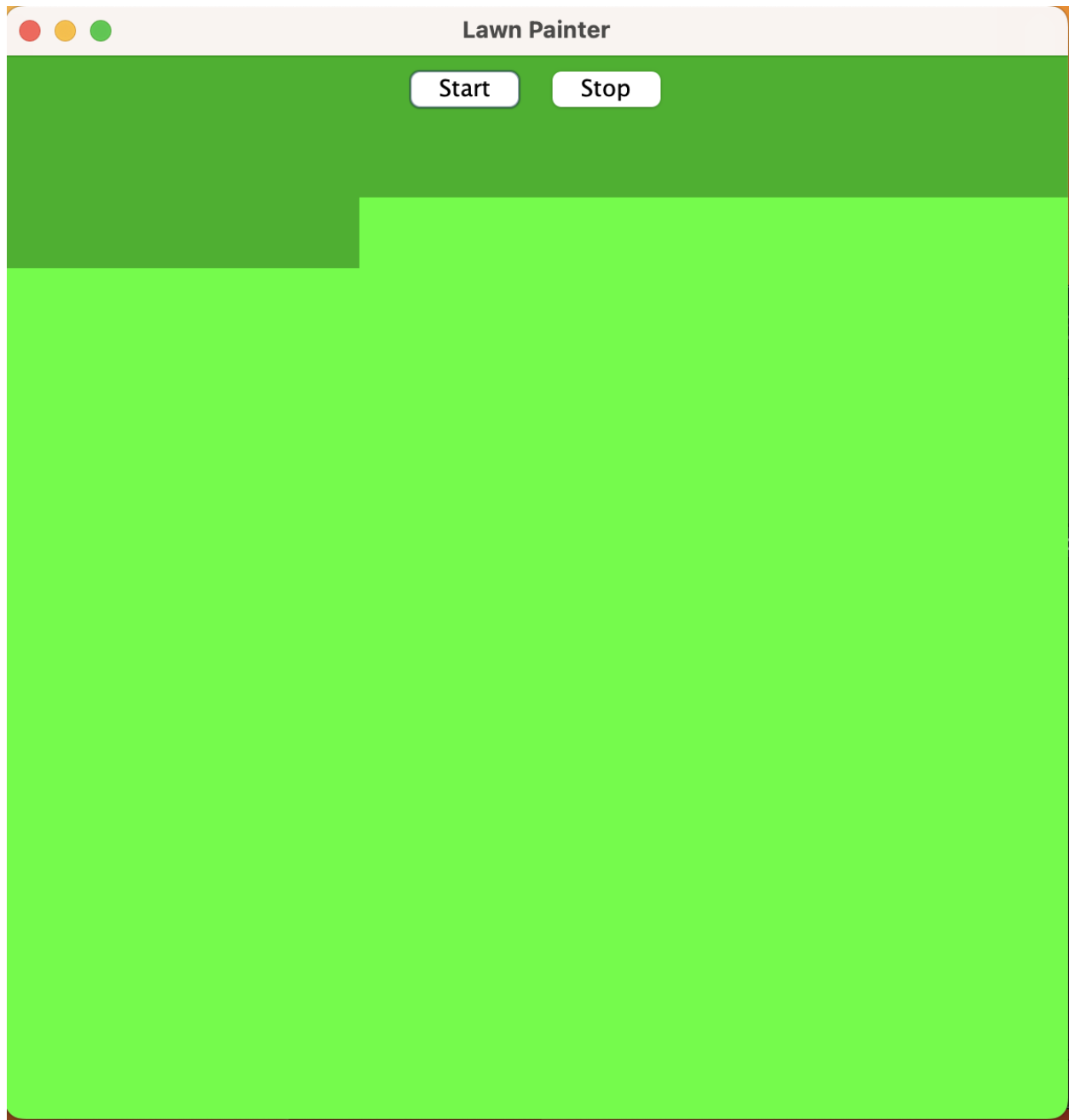
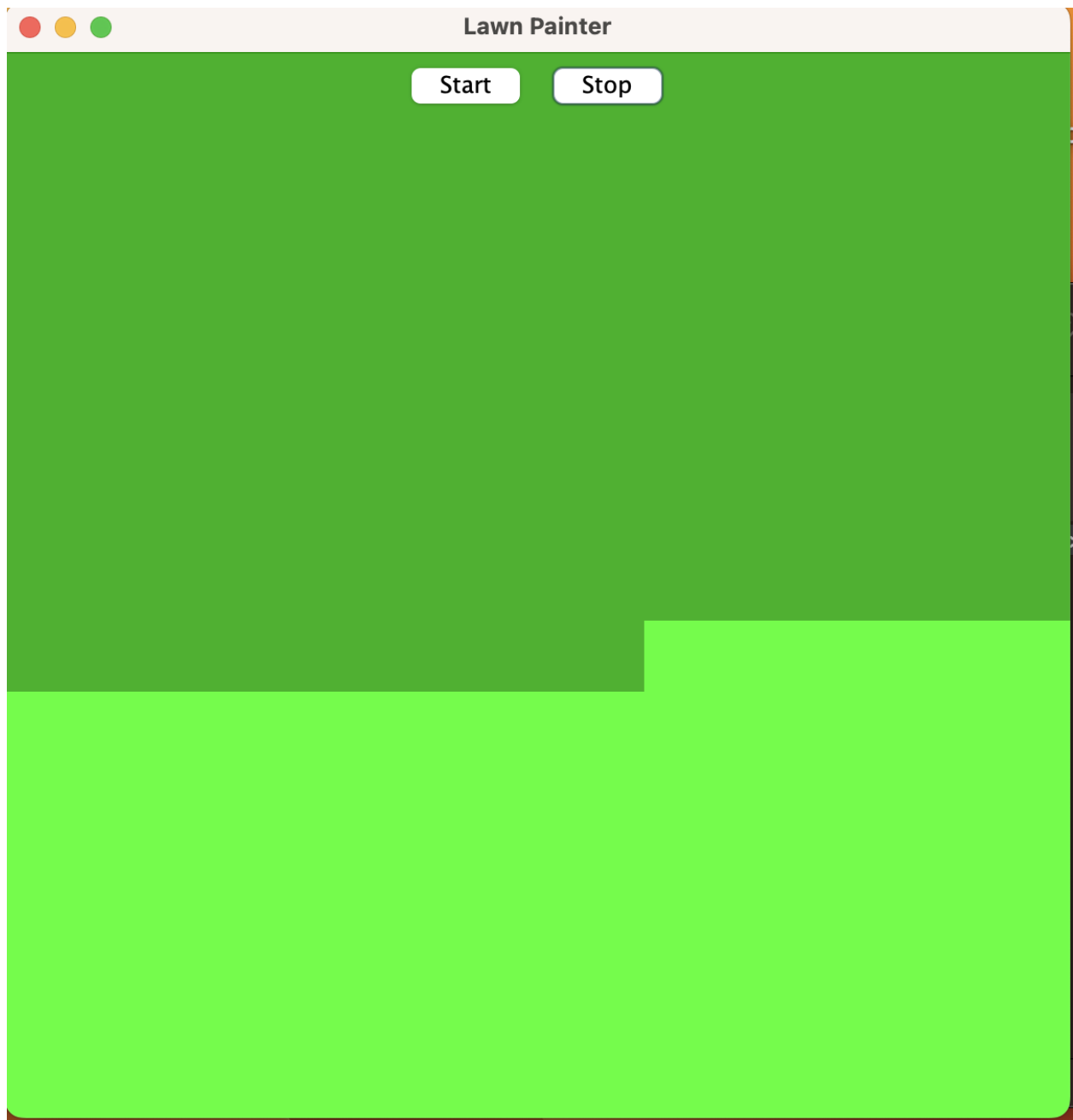Implemented in folder **Balkothe_Soham_CSE5322_S23_HW4_impl.zip**

Screenshots:

Initial State

2. Start button on

3. Stop Activated

4. Lawn completely mowed (terminal state)