

Software Test Cases

Class Diagrams – 12

12.1.1

- Description: The application creates a Turing Machine object
- Component:
 - Type: class
 - Name: TuringMachine
 - TuringMachine::TuringMachine(string definitionFileName)
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of TuringMachine is created

12.1.2

- Description: The application does not create a Turing Machine object with an invalid definition
- Component:
 - Type: class
 - Name: TuringMachine
 - TuringMachine::TuringMachine(string definitionFileName)
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of TuringMachine exists

12.1.3

- Description: The application can terminate a Turing machine's operation
- Component:
 - Type: method
 - Name: TerminateOperation
 - void TuringMachine::TerminateOperation()
- Input Condition: none
- Input State or Configuration: The Turing machine is currently running on a valid string
- Expected Result: The Turing machine halts its operation

12.2.1

- Description: The application creates a Tape object
- Component:
 - Type: class
 - Name: Tape
 - Tape::Tape()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of Tape is created

12.2.2

- Description: The application does not create a Tape object without a Turing Machine object
- Component:
 - Type: class
 - Name: Tape
 - Tape::Tape()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of Tape exists

12.2.3

- Description: The application allows viewing the current cell character of the tape when running on a string
- Component:
 - Type: method
 - Name: CurrentCharacter
 - char Tape::CurrentCharacter() const
- Input Condition: none
- Input State or Configuration: The Turing machine is currently running on a valid string
- Expected Result: The current cell character is returned

12.3.1

- Description: The application creates an Input Alphabet object
- Component:
 - Type: class
 - Name: InputAlphabet
 - InputAlphabet::InputAlphabet()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of InputAlphabet is created

12.3.2

- Description: The application does not create an Input Alphabet object without a Turing Machine object
- Component:
 - Type: class
 - Name: InputAlphabet
 - InputAlphabet::InputAlphabet()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of InputAlphabet exists\

12.3.3

- Description: The application allows viewing the Input Alphabet from the Turing machine definition
- Component:
 - Type: method
 - Name: View
 - void InputAlphabet::View() const
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: The Input Alphabet is printed out

12.4.1

- Description: The application creates a Tape Alphabet object
- Component:
 - Type: class
 - Name: TapeAlphabet
 - TapeAlphabet::TapeAlphabet()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of TapeAlphabet is created

12.4.2

- Description: The application does not create a Tape Alphabet object without a Turing Machine object
- Component:
 - Type: class
 - Name: TapeAlphabet
 - TapeAlphabet::TapeAlphabet()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of TapeAlphabet exists
- Description: The application allows viewing the Input Alphabet from the Turing machine definition
- Component:
 - Type: method
 - Name: View
 - void InputAlphabet::View() const
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: The Input Alphabet is printed out

12.4.3

- Description: The application allows viewing the Tape Alphabet from the Turing machine definition
- Component:
 - Type: method
 - Name: View
 - void InputAlphabet::View() const
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: The Tape Alphabet is printed out

12.5.1

- Description: The application creates a Transition Function object
- Component:
 - Type: class
 - Name: TransitionFunction
 - TransitionFunction::Load(ifstream& definition, bool& valid)
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of TransitionFunction is created

12.5.2

- Description: The application does not create a Transition Function object without a Turing Machine object
- Component:
 - Type: class
 - Name: TransitionFunction
 - TransitionFunction::Load(ifstream& definition, bool& valid)
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of TransitionFunction exists

12.5.3

- Description: The application can add transitions to the Transition Function
- Component:
 - Type: method
 - Name: Add
 - void TransitionFunction::Add(Transition t)
- Input Condition: t is a valid Transition found in the Turing machine definition
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A transition is added to the list of transitions

12.6.1

- Description: The application creates at least one Transition object
- Component:
 - Type: class
 - Name: Transition
 - Transition::Transition(string newSource, char newRead, string newDest, char newWrite, Direction newDir):
source(newSource), read(newRead), destination(newDest),
write(newWrite), move(newDir)
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: At least one instance of Transition is created

12.6.2

- Description: The application does not create a Transition object without a Transition Function object
- Component:
 - Type: class
 - Name: Transition
 - Transition::Transition(string newSource, char newRead, string newDest, char newWrite, Direction newDir):
source(newSource), read(newRead), destination(newDest),
write(newWrite), move(newDir)
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of Transition exists

12.6.3

- Description: The application allows retrieving the name of the source state of a transition
- Component:
 - Type: method
 - Name: GetSource
 - string Transition::GetSource() const
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: The source state string name of the transition is returned

12.7.1

- Description: The application creates a State object
- Component:
 - Type: class
 - Name: State
 - State::State()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of State is created

12.7.2

- Description: The application does not create a State object without a Turing Machine object
- Component:
 - Type: class
 - Name: State
 - State::State()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of State exists

12.7.3

- Description: The application allows retrieving the total number of states found in the Turing machine definition
- Component:
 - Type: method
 - Name: TotalNumberOfStates
 - int State::TotalNumberOfStates()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: The total number of states is returned

12.8.1

- Description: The application creates a Final State object
- Component:
 - Type: class
 - Name: FinalState
 - FinalState::FinalState()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: A single instance of FinalState is created

12.8.2

- Description: The application does not create a Final State object without a Turing Machine object
- Component:
 - Type: class
 - Name: FinalState
 - FinalState::FinalState()
- Input Condition: none
- Input State or Configuration: main() is running and Turing machine file is invalid
- Expected Result: No instance of FinalState exists

12.8.3

- Description: The application allows setting the name of a Final State
- Component:
 - Type: method
 - Name: SetName
 - `void FinalState::SetName(string stateName)`
- Input Condition: stateName is a valid state name
- Input State or Configuration: main() is running and Turing machine file is valid
- Expected Result: The member name of the final state is set to stateName