CSC 303 Teamwork T07

| Teamworks in this course are to be done collaboratively. In teams, it is important to make sure that everyone is contributing to and benefiting from the discussion. Brainstorming and debating ideas with other students is an excellent way to You are welcome to consult the professor, your teammates, the textbook, and other online resources (***not*** including ones that provide solutions to our specific problems) to complete any teamwork, but you *must* explicitly acknowledge any sources besides the professor, your teammates, and the textbook in the *Acknowledgements* section at the end of the document. |
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This teamwork covers material from Chapter 3, Section(s) 1 from [**the textbook**](https://moodle.berea.edu/pluginfile.php/737252/mod_resource/content/1/Sipser_Introduction.to.the.Theory.of.Computation.3E.pdf).

A Turing Machine is a tuple (Q, Σ, Γ, ẟ, q0, qaccept, qreject) where

Q is the set of states,

Σ is the input alphabet not containing the blank symbol \_

Γ is the tape alphabet, where \_ ∈ Γ and Σ ⊆ Γ

δ : Q ⨉ Γ → Q ⨉ Γ ⨉ {L, R, stay} is the transition function

q0 ∈ Q is the start state

qaccept ∈ Q is the accept state, and

qreject ∈ Q is the reject state, where qreject ≠ qaccept

1. Design a Turing Machine that accepts the language made up of all palindromes from the alphabet {a, b}. You may draw this using our usual tools, or define each element of the 7-tuple described above. Then show its series of configurations on the string 'abaaba'.

*Design*:

*Configurations*:

1. Translate your Turing Machine you created above into a design on [**JFLAP**](https://www.jflap.org/jflaptmp/). Show screenshots of your machine in its initial state and its final state on one input that accepts and one that doesn’t. Additionally, you do not need to rewrite the configurations for this question – only the screenshots.
2. Design a Turing Machine that takes as input the language {ω1#ω2 | ω1, ω2 ∈ {0, 1}\*} and adds the two numbers together, recording the result on the tape. You are welcome to format the input any way you like – in other words, each binary number may be stored least-significant-bit-first or most-significant-bit-first. Just be sure to explicitly mention how you are storing your input.

| **Acknowledgements:** |
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