Question from Past Exam — FSM

Finite State Machines and Regular Expressions

Write a Finite State Machine (the circles and arrows diagram) which recognizes `marks` files in the following format. A `marks` file consists of a sequence of student records, each student record has the following format...

```
studentNumber lastName, firstName optionalMiddleNames
    # optional comment
    # optional comment
    # ...
    Assignment:
        number: mark/outOf
        ...
    Midterm: mark/outOf
    Final: mark/outOf
```

Notes: The student number line begins a new student record. All fields in the student number line are required except middle names. The comments section has an arbitrary number of comments, each of which begins with a `#`. You should ignore white space (leading and internal) when there is no ambiguity. The `Comments`, `Assignments`, `Midterm` and `Final` sections must appear in that order, none are optional. Each `Assignment` mark begins with an assignment number and then a mark. You should recognize any number of `Assignment` marks, including 0. Your Finite State Machine should have transitions labelled by regular expressions (see the Appendix for some hints). You should capture, with brackets '(' and ')', any of the important fields: `studentNumber`, `lastName`, `firstName`, `number`, `mark`, `outOf`, etc. Do not escape your strings (as they would appear in a Java Program). Your finite state machine should recognize the example `marks.txt` file below.

```
---------------------------- marks.txt -----------------------------
992123949 Smith, Sid
    # Sid had a rough start
    Assignments:
        1:23/50
        2: 33/50
        3: 45/45
        4:   70/100
    Midterm: 85 /  100
    Final: 35/100
```