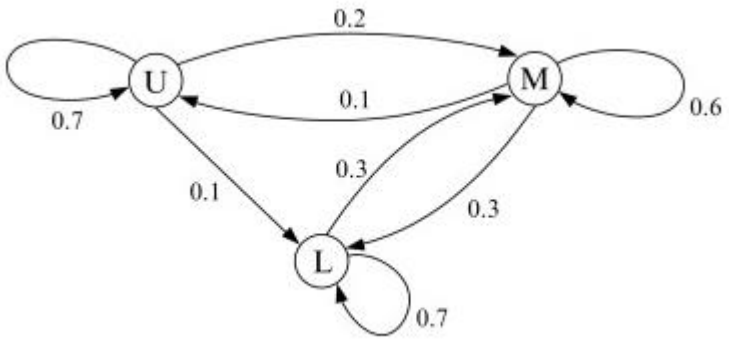
Question #1:

Assume that people in a particular society can be classified as belonging to the upper class (U), middle class (M), and lower class (L). Membership in any class is inherited in the following probabilistic manner. Given that a person is raised in an upper-class family, he or she will have an upper-class family with probability 0.7, a middle-class family with probability 0.2, and a lower-class family with probability 0.1. Similarly, given that a person is raised in a middle-class family, he or she will have an upper-class family with probability 0.1, a middle-class family with probability 0.6, and a lower-class family with probability 0.3. Finally, given that a person is raised in a lower-class family, he or she will have a middle-class family with probability 0.3 and a lower-class family with probability 0.7.



For above state transition diagram, write the paths to achieve:

1. All states coverage

2. All events coverage

3. All transitions coverage.

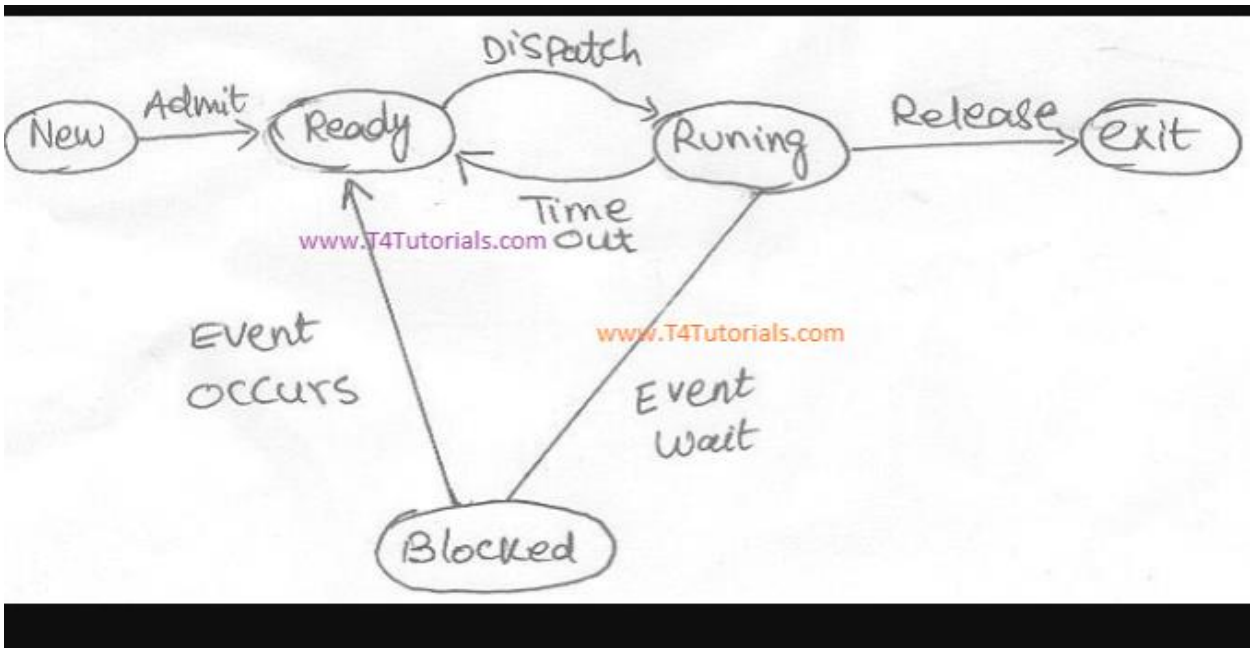
Answer #1:

1. All states coverage
    a. U(0.2)->M(0.3)->L
    b. And more combinations exists, but for combinations. That covers all states at once, above works
2. All events coverage
    a. M(0.1)->U(0.2)->M(0.6)->M(0.3)->L(0.7)->L
    b. And more combinations exists, but for combinations. That covers all events at once, above works
3. All transitions coverage.
    a. M(0.3)->L(0.7)->L(0.3)->M(0.6)->M(0.1)->U(0.2)->M(0.1)->U(0.7)->U(0.1)->L

b. And more combinations exists, but for combinations. That covers all transitions at once, above works

Question #2:

Given below is the state transition diagram of the OS process:



What do you think which state transition testing coverage best suits in this scenario?

And write the reason.

Answer #2:

All Events Coverage will work to cover test.

It is because:

- We have Identical(non-repeating) events

Question #3:

For instance you are hired as QA manager in a company and these requirements are given to you, and you are asked to suggest testing technique. What do you think which testing technique(s) best suits in this scenario and why?

R 1. System shall allow the student to login

R 2. System shall load Pre-Assessment test for every new student logging in the system for the first time.

R 3. System shall initialize User Model on Pre-Assessment Test completion.

R 4. System shall allow student to select the Lesson tutorial that explains

- Navigation in a typical lesson
- Practice and Evaluation
- Progress report
- History of usage

R 5. System shall allow student to select the System Tutorial that explains the overall system

R 6. System shall allow the student to skip Lesson and System Tutorial.

R 7. System shall allow the student to view Lesson Plan consisting of list of lesson and their respective sub-concepts.

R 8. System shall allow the student to view lesson dependency graph, highlighting three different types of lessons:

- Green color - Already learned lessons.
- Blue color – Lessons which student is eligible to learn.
- Red color - Lessons which student does not qualify to learn.

R 9. System shall operate in a program controlled mode and system will decide the next lesson to be presented on the basis of evaluation results of the previous lesson and User Modeling parameters.

R 10. System shall display the lesson contents depending on the student's prior knowledge and system's usage as per User Model.

R 11. System shall display the contents using different modes e.g. text, images, voice; depending on the student needs as predicted in their respective User Model.

R 12. System shall support normal and easy way to explain a particular concept as per domain knowledge of the student.

R 13. System shall provide subtitles on/off facility.

R 14. System shall provide sound on/off facility.

R 15. System shall provide at least three examples while explaining a particular concept.

R 16. System shall present at least three evaluation activities in each lesson.

R 17. System shall present evaluation activities with at least five questions.

R 18. System shall allow the student to skip any section of a lesson except Evaluation.

R 19. System shall provide explanatory feedback against the activities (practice and evaluation).

R 20. System shall maintain evaluation results of each lesson that can be viewed by the student as the progress report

R 21. System shall allow the student to monitor his/her progress.

R 22. System shall also allow the student to logout during the lesson.

R 23. System shall record lesson status in a user model database when the student logouts from the system.

R23.1 System shall record lesson level status if student logouts after lesson completion

R23.2 System shall record concept level status of the student during current lesson only so that if the student logouts taking a lesson, his/her state can be saved and later on restored.

R 24. System shall maintain the history of usage e.g.

- The number of times user has logged into the system
- Amount of lessons, activities carried out per session
- Time spent using the program during a session
- Date and time when the lesson was taken
- Number of attempts
- Percentage of correct and incorrect answers in a lesson

Answer #3:

We will use **State Transition Testing** because we see here that:

- There is noticeability for sequence of transitions and events
- Behavioral Changes from one statement to another are to be observed
- Each statement have some of its own behavioral changes to be observed
- Input, Outputs and State of a system is making an impact on the system