Q1: In a university degree program, students are required to successfully complete five courses from three different pools A, B and C as given below.

A = {Programming Fundamental, Discrete Structure, Digital Logic Design}

B = {Object Oriented Programming, Computer Organization, Computer Networks}

C = {Information Security, Enterprise System}

The following restrictions are imposed by the authority or by students themselves.

- Same course cannot be passed twice
- None of the student is willing to pass more that 5 courses to complete his/her degree.
- Students must pass at least two courses from pool A to takes courses from pool B and pool C
- Students must pass at least two courses from pool B to takes courses from pool C.

Construct the DFA to show all the possible ways in which a students can successfully complete his or her degree.

Programming Fundamental = f,

Discrete Structure = s,

Digital Logic Design = l

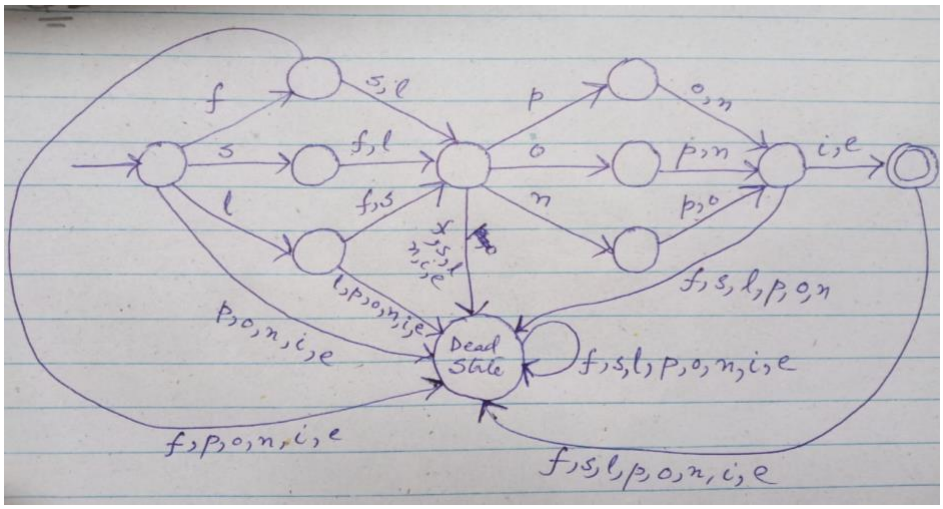
Object Oriented Programming = p

Computer Organization = o

Computer Networks = n

Information Security = i

Enterprise System = e



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Q2: An elementary school divided his periods into early morning pre-noon and post noon sessions. The following courses are taught during these sessions:

Early Morning= {Mathematic, Science, English}

Pre Noon= {Urdu, Islamic studies, Pakistan studies}

Post Noon = {Sindhi, Drawing, Physical Training}

Teacher will select courses of their choice with following restrictions:

- Each teacher has to select a course from every session in an academic year.
- Each teacher must not conduct more than 4 courses in an academic year.
- A teacher can select two different courses only from pre noon session.

Construct the DFA to show all the possible ways in which a teacher can their course.

Mathematic = m

Science = s

English=e

Urdu = u

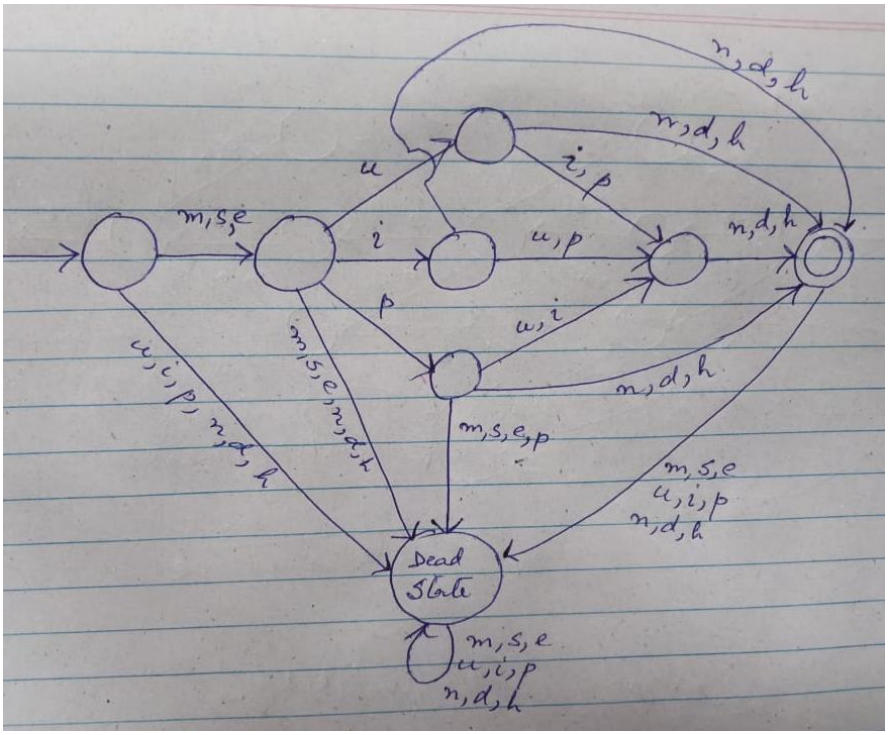
Islamic studies = i

Pakistan studies = p

Sindhi = n

Drawing = d

Physical Training = h



Note: Please assume that all unshown transitions are going toward dead state.

Q3: A travel agent provides customized traveling plans for his valuable clients. He designs three pools of worth seeing places in Northern area and capital of Pakistan.

A = {Shah Faisal Mosque, Pakistan monument, Lok Virsa Heritage museum}

B = {Kashmir point, Sangrela Natural water park, Patriata}

C = {Hunza valley, Kaghan valley, Shogran valley}

The following restrictions are imposed on the clients:

- The clients must select exactly one point from pool A.
- The clients must select exactly two different points from pool B.
- The clients must select exactly one point from pool C.

A travel guide has the following restrictions while visiting his clients to their chosen places:

- Pool A places must be visited first.
- Pool B places must be visited after visiting pool A.
- Pool C places must be visited in the last.

Construct the DFA to show all the possible ways in which a travel guide visit the above places along with his clients.

Shah Faisal Mosque = f

Pakistan monument = m

Lok Virsa Heritage museum = l

Kashmir point = k

Sangrela Natural water park = n

Patriata = p

Hunza valley = h

Kaghan valley = g

Shogran valley = s