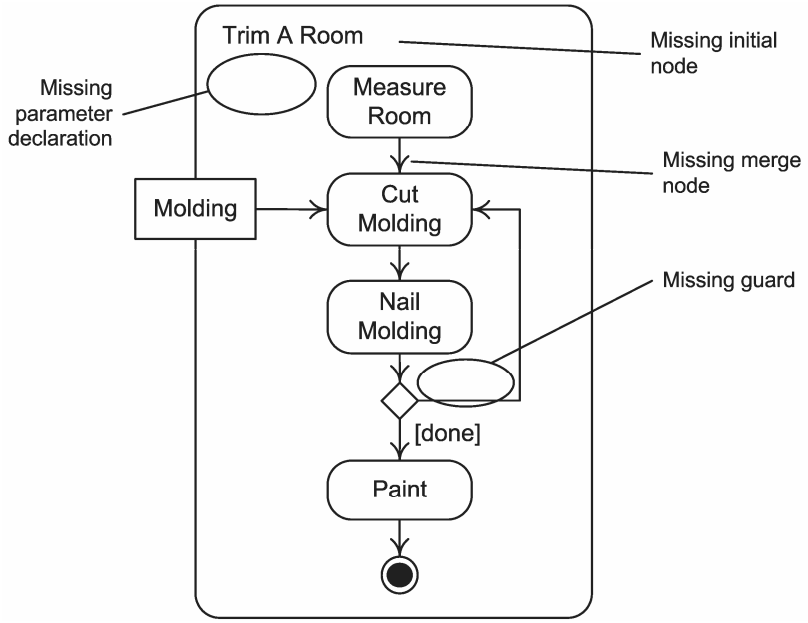
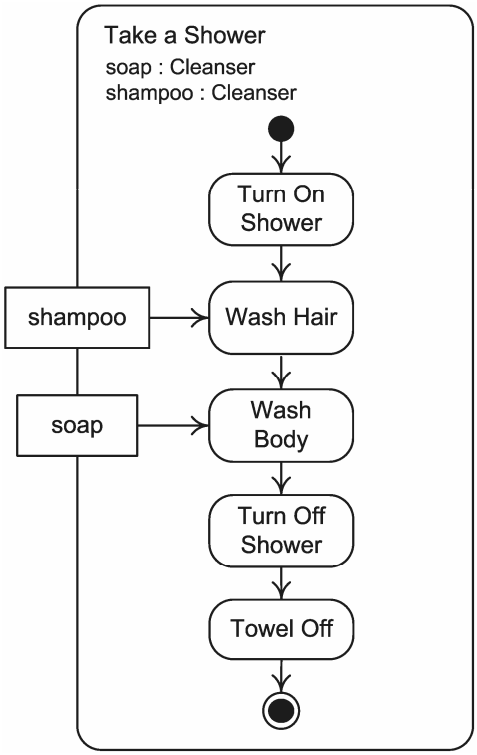
2 Software Design Processes and Management

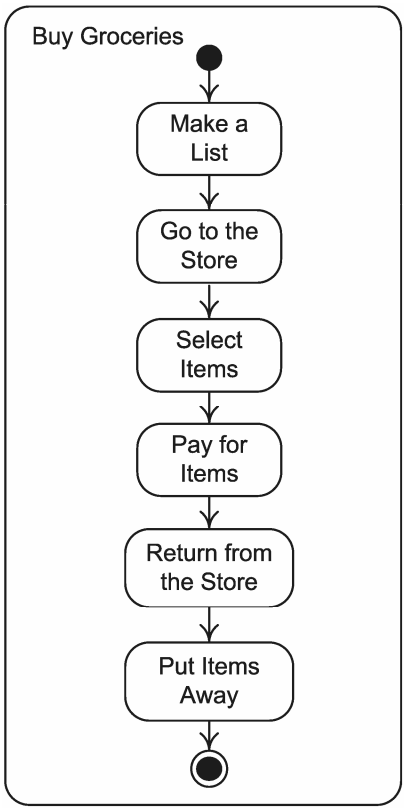
Section 2.1 1. The figure below indicates the errors in the diagram.



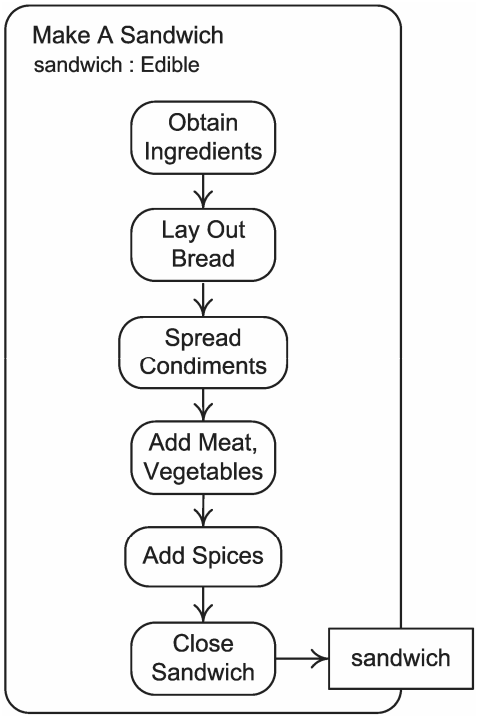
2. There are many ways to model this problem. The following diagram is an acceptable solution.



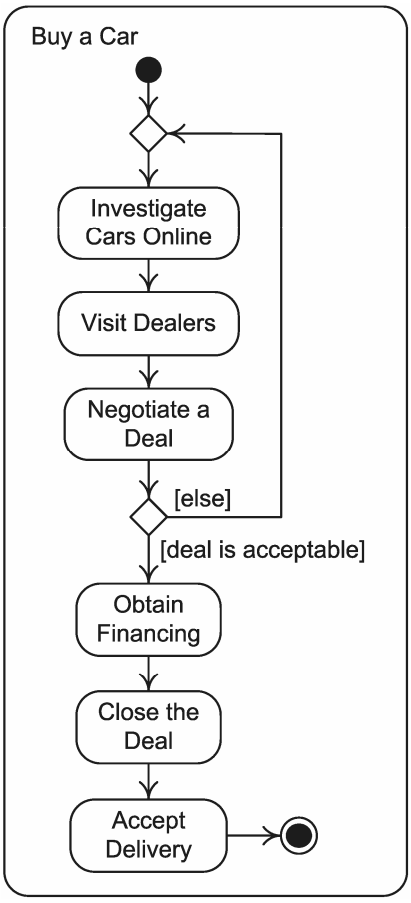
3. The following diagram is an acceptable solution.



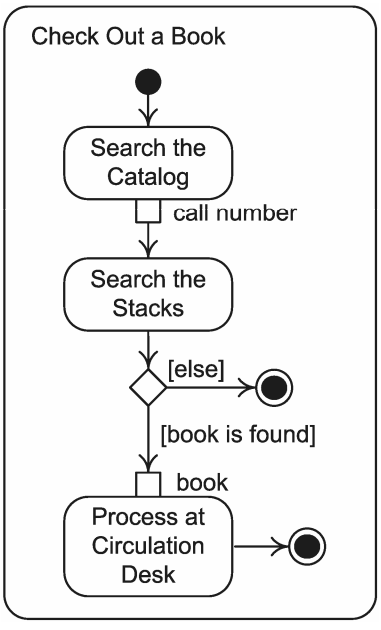
4. The following diagram is an acceptable solution.



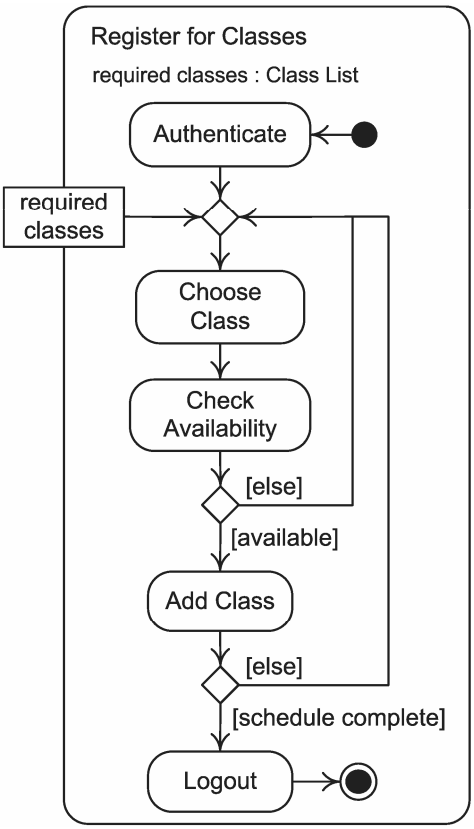
5. The following diagram is an acceptable solution.



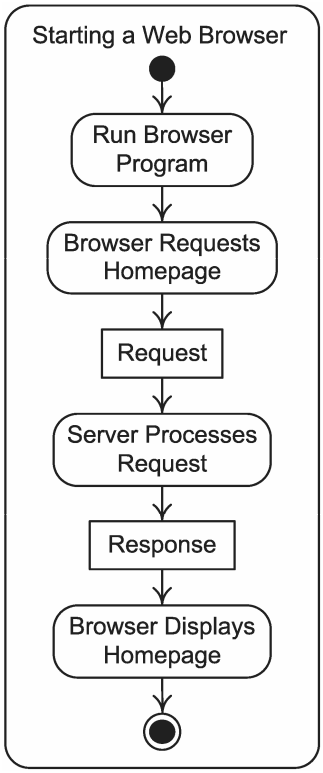
6. The following diagram is an acceptable solution.



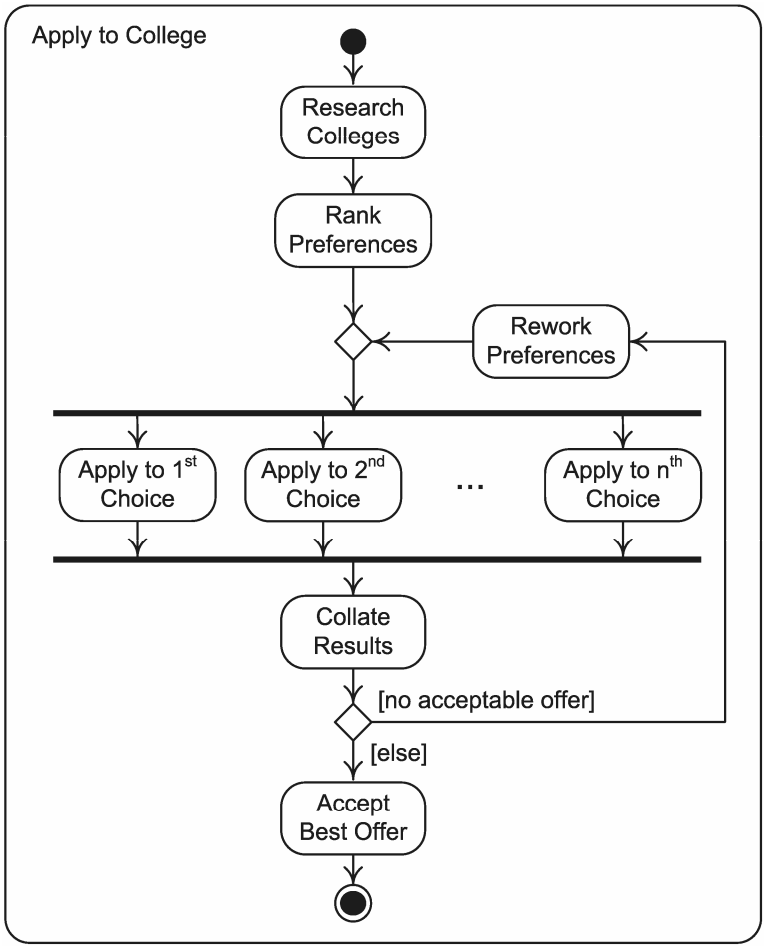
7. The following diagram is an acceptable solution.



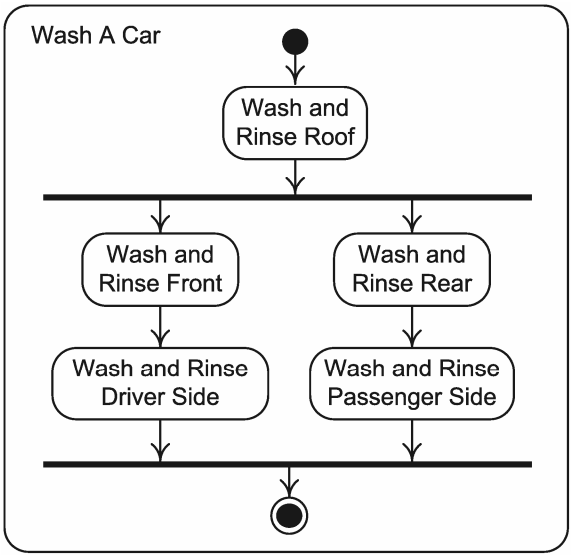
8. The following diagram is an acceptable solution.



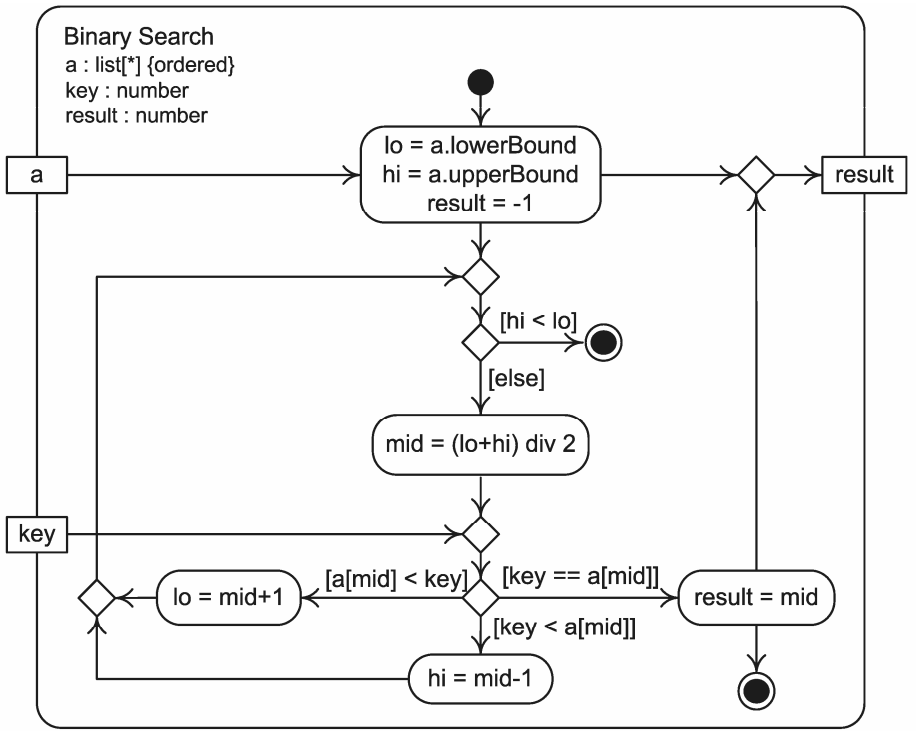
9. The following diagram is an acceptable solution.



10. The following diagram is an acceptable solution.



11. The following diagram is an acceptable solution.



12. The solution to this problem depends on the student.

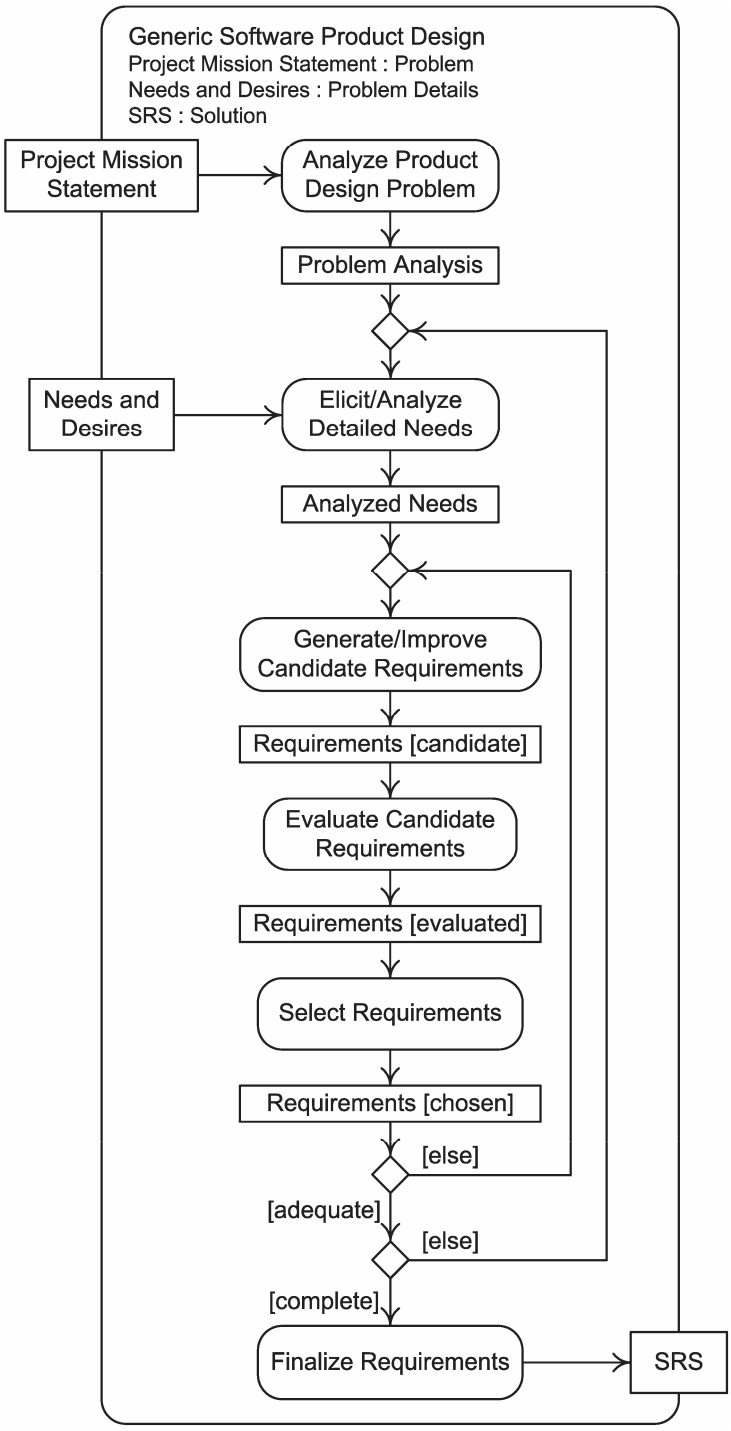
13. Some useful heuristics:

- Try not to cross edges
- Use mainly horizontal and vertical edges
- Avoid flow final nodes (they often lead to deadlocks)

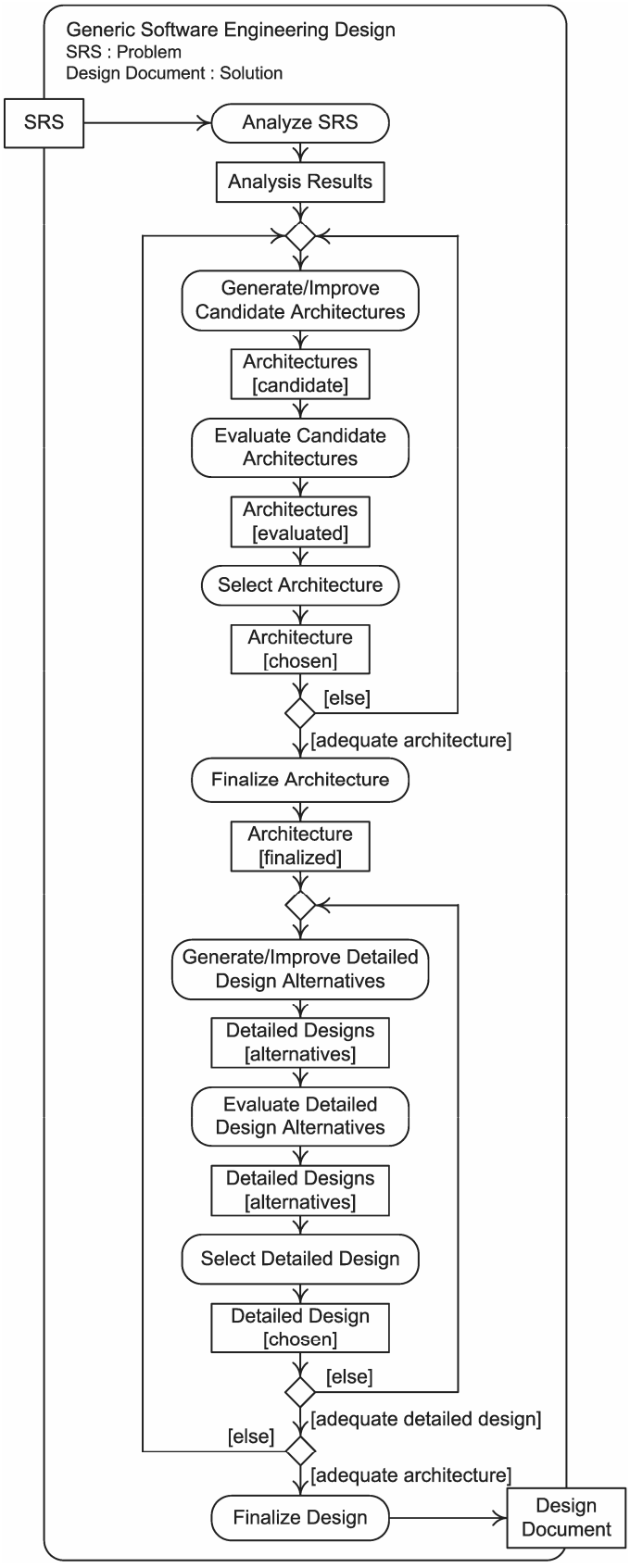
Section 2.2

14. (a) ER
(b) PR
(c) PA
(d) ER
(e) PR
(f) EA
(g) ER
(h) PR

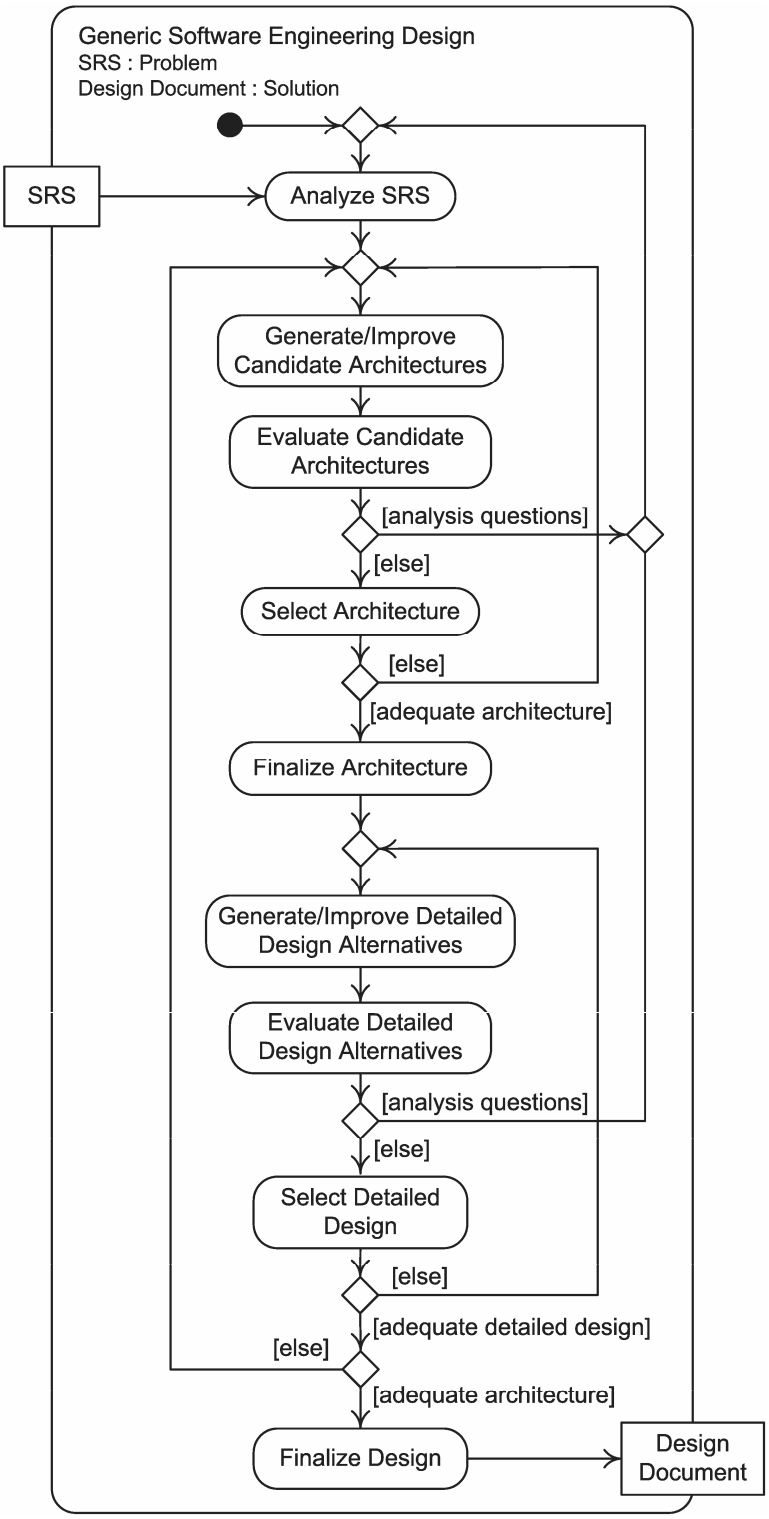
15. Acceptable solutions should resemble the following diagram.



16. Acceptable solutions should resemble the following diagram.



17. As emphasized in the text, iteration occurs in many places in engineering design. The diagram below shows the iteration that may occur back to the analysis step. It is shown occurring after design evaluation because that is one of the places most likely to reveal inadequate understanding of the design problem. The diagram is already large and complex, so additional points of origin for iteration back to analysis are not shown.



Section 2.3

18. **Management** is the activity of assembling, directing, and supporting human and other resources in accomplishing tasks beyond the capacity of an individual (see the Glossary).

19. Some more examples of operations are janitorial services, facilities maintenance, billing, inventory, and security operations. Some more examples of projects are moving to a new location, hiring new personnel, installing a major piece of equipment, and planning a special event (such as a conference or an awards banquet).

20. A project can go wrong in the following ways (among many others):
    - Relying on bad estimates
    - Following a poor schedule
    - Having inappropriate or incompetent staff
    - Adopting bad policies and procedures
    - Using inadequate tools
    - Trying to accomplish an infeasible task
    - Having incomplete or incorrect task specifications
    - Having poor management
    - Trying to keep up with a rapidly changing task specification
    - Having an inadequate budget
    - Encountering a disaster (such as a fire, computer failure, or loss of key personnel).

21. Testing and debugging take longer for larger products and for poorly implemented products. Early estimates of size are often inaccurate, which makes estimating the testing and debugging effort difficult. Product quality is also hard to assess early on. Once the quality of part of a product has been determined it is easier to make accurate estimates of the testing and debugging effort.