

i Front Page

Written exam in [IN5130-IN9130-ITLED4320]

2020 Fall

Duration: [December 1, 9:00] to [December 1, 13:00]

It is important that you read this page carefully before you start.

General information:

- It is important that you check the course's semester page regularly. Important messages during the exam will be posted on the semester page.
- Remember that your submission need to be anonymous, do not write your name in your submission.
- All examination support materials are permitted. You need to gather information from available sources, assess the information quality, and put it together in a submission based on your own processing of the content. The submission must reflect your individual level of knowledge.

Collaboration

- Collaboration with or help from other human beings is not allowed during the exam. Each student is expected to do the exam on hisown/herown.

Contact:

- [User support for exams](#)
- For questions regarding the interpretation of the exampaper you may email Ketil Stølen at any point during the exam: kst@sintef.no

i Context for Question 1

The context for Question 1 is the Gestalt Service from Oblig-I and Oblig-III.

3 **Question 1 c**

Which events may occur as the last event in a negative trace of sd GestaltService0? Explain your answer.

Format

-

B

I

U

x_2

x^2

I_x

Ω

Σ

ABC

Words: 0

Maximum marks: 5

4 **Question 1 d**

Let P16 be the set of positive traces described by sd GestaltService0 of length less than or equal to 16. Let N16 be the set of negative traces described by sd GestaltService0 of length less than or equal to 16. Is the number of traces in N16 less than, equal to or greater than the number of traces in P16. Explain your answer.

Format

-

B

I

U

x_2

x^2

I_x

Ω

Σ

ABC

Words: 0

Maximum marks: 5

i **Context for Question 2**

The context for Question 2 is the Gestalt Service from Oblig-I and Oblig-III.

5 **Question 2 a**

Which events may occur as the first event in a positive trace of sm Service User? Explain your answer.

Format ▾ | **B** *I* U x_2 x^2 | I_x | | | | | | Σ | ABC ▾ |

Words: 0

Maximum marks: 5

i **Context for Question 3**

The context for Question 3 is the Gestalt Service from Oblig-I and Oblig-III.

8 **Question 3 a**

Argue why sd GestaltService1 is a better model than sd GestaltService0.

Format ▾ | **B** *I* U x_2 x^2 | I_x |   |    |   |   |  | Σ | ABC ▾ | 

Words: 0

Maximum marks: 5

9 **Question 3 b**

Is sd GestaltService1 a refinement of sd GestaltService0? If so, what kind? Explain your answer.

Format

-

B

I

U

x_2

x^2

I_x















Ω





Σ

ABC



Words: 0

Maximum marks: 5

i **Context for Question 4**

The context for Question 4 is the Gestalt Service from Oblig-I and Oblig-III.

How many interaction obligations are there in the semantics of sd GestaltService2? Explain your answer.

Maximum marks: 5

11

Is sd GestaltService1 a refinement of sd GestaltService2? If so, what kind? Explain your answer.

NOTE that sd Gestaltservice2 is the specification that is being refined.

Maximum marks: 5

i **Context for Question 5**

The context for Question 5 is the Gestalt Service from Oblig-I and Oblig-III.

12 **Question 5 a**

What is the minimal length of a negative trace described by sd GestaltService3? Explain your answer.

Format ▾ | **B** *I* U x_2 x^2 | I_x | | | | | | ABC ▾ |

Words: 0

Maximum marks: 5

13

Question 5 b

What is the maximal length of a negative trace described by sd GestaltService3? Explain your answer.

Format

B

I

U

x_2

x^2

I_x

Ω

Σ

ABC

Words: 0

Maximum marks: 5

14

Question 5 c

Is sd GestaltService3 a refinement of sd GestaltService2? If so, what kind? Explain your answer.

Format

B

I

U

x_2

x^2

I_x

Ω

Σ

ABC

Words: 0

Maximum marks: 5

i Context for Question 6

Context: In Oblig-III the party on whose behalf we did the risk assessment was the Gestalt Service. In the following the party is a company named UML Modelling specializing in helping customers specify their systems in UML. UML Modelling are worried about their employees' extensive use of Gestalt Service. UML Modelling has hired us to assess to what extent this use of this particular service may impact the reputation of UML Modelling. We are supposed to do a CORAS risk assessment on their behalf addressing this issue.

15 Question 6 a

Which of the following would be suitable assets given the above context: *integrity of models*, *accountability of service*, *safety of service*, *reputation of service*, *privacy*, *correctness of service*? Explain your answer.

Maximum marks: 6

16 **Question 6 b**

Define a good qualitative consequence scale with five values for the asset "Comprehensibility of report".

Format

B

I

U

x_2

x^2

I_x

Ω

Σ

ABC

Words: 0

Maximum marks: 6

17 **Question 6 c**

Define a good quantitative consequence scale for the asset "Comprehensibility of report".

Format

B

I

U

x_2

x^2

I_x

Ω

Σ

ABC

Words: 0

Maximum marks: 6

18 **Question 6 d**

Use the CORAS tool to specify a threat diagram (without likelihoods and consequences) for a relevant external malicious attack given the context described above. The selection of direct asset is up to you (given the context for the question).

There should be at least one vulnerability for each initiate and leads-to relation. The various elements in the diagram should be assigned text in English that fits well with the context for the question.

Do a screenshot of the finished diagram. Save it as pdf and upload the pdf file below.



Upload your file here. Maximum one file.

All file types are allowed. Maximum file size is **1 GB**

Select file to upload

Maximum marks: 6

19 **Question 6 e**

Use the CORAS tool to specify a good threat scenario (without likelihoods and consequences) with respect to a non-malicious human threat given the context described above. The selection of direct asset is up to you (given the context for the question).

There should be at least one vulnerability for each initiate and leads-to relation. The various elements in the diagram should be assigned text in English that fits well with the context for the question.

Do a screenshot of the finished diagram. Save it as pdf and upload the pdf file below.



Upload your file here. Maximum one file.

All file types are allowed. Maximum file size is **1 GB**

Select file to upload

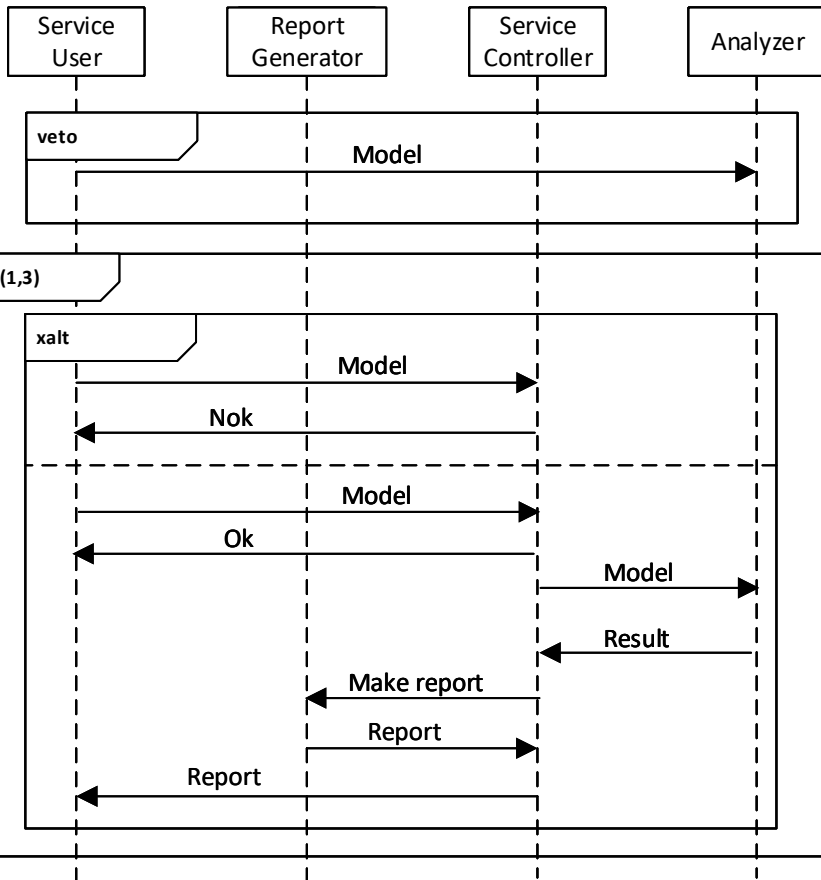
Maximum marks: 6

Question 10

Attached



sd GestaltService2

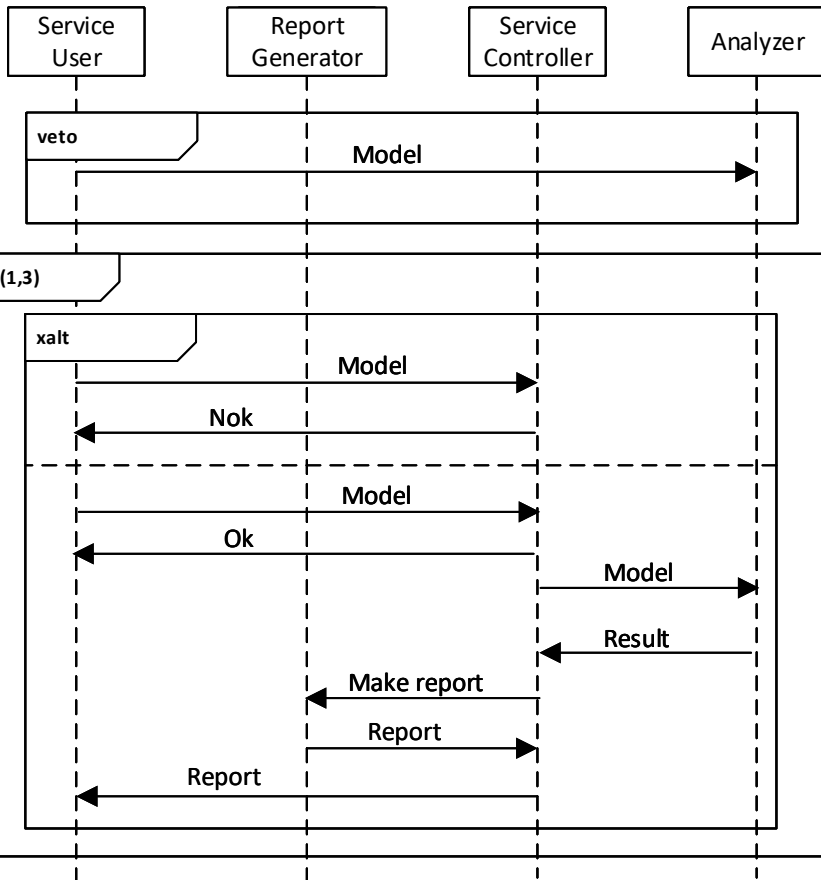


Question 11

Attached



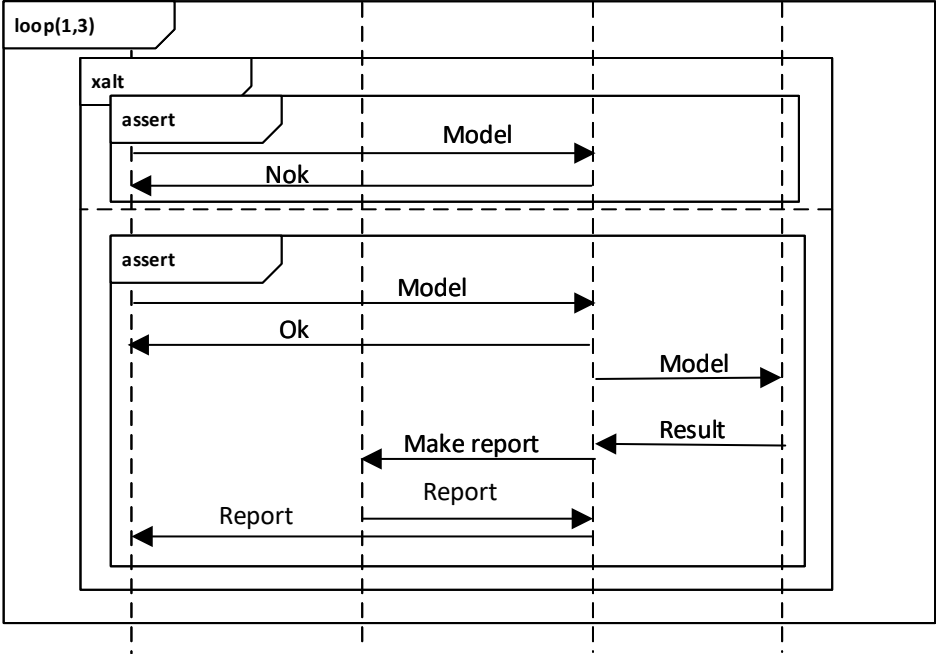
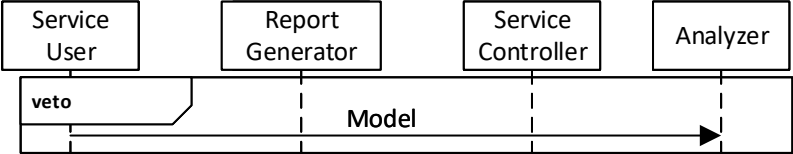
sd GestaltService2



Question 12

Attached

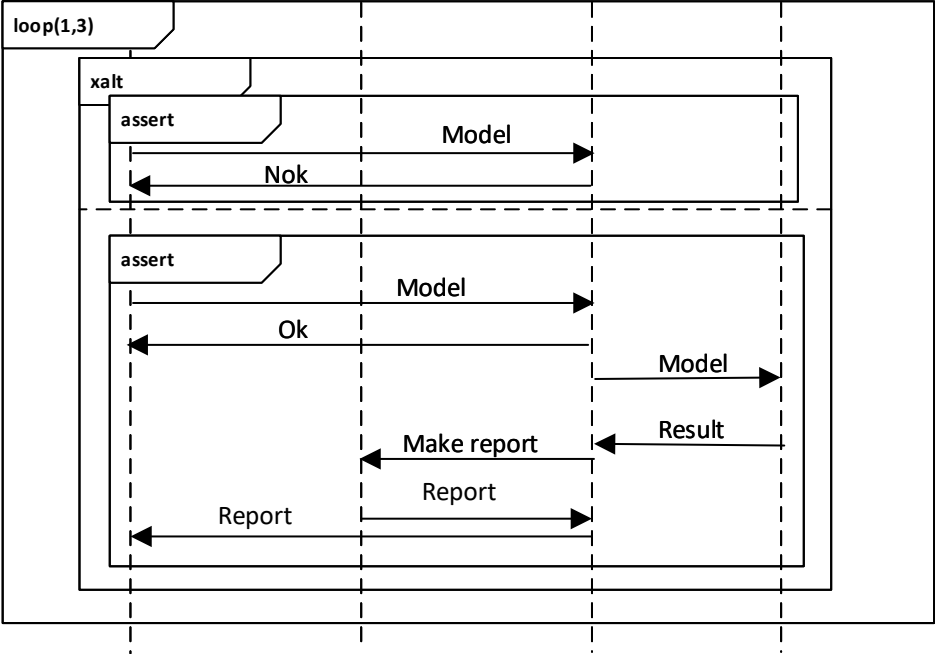
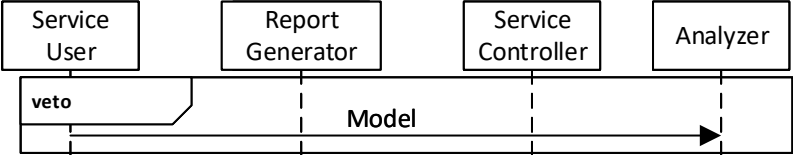




Question 13

Attached

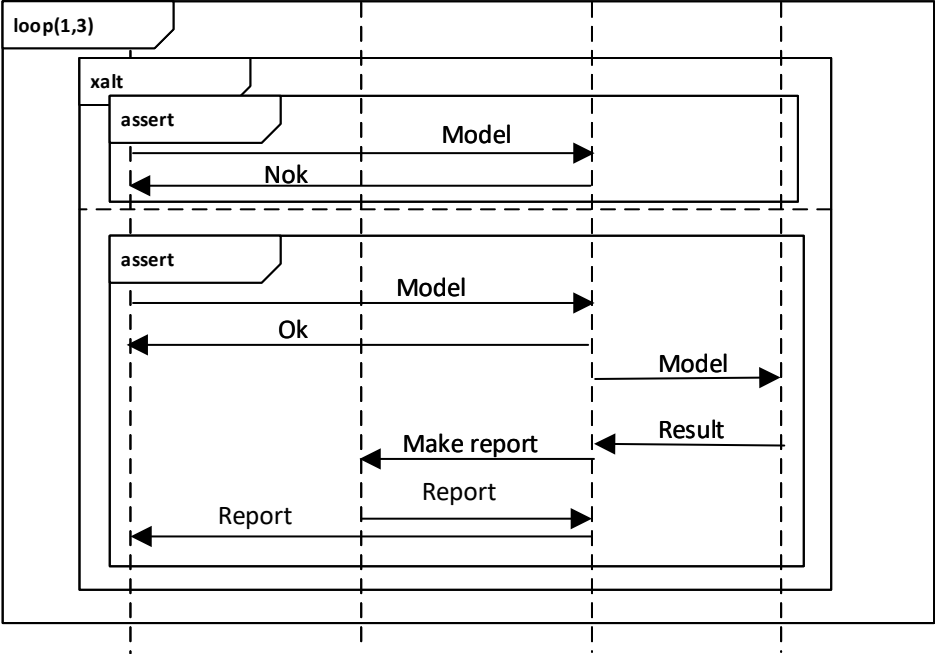
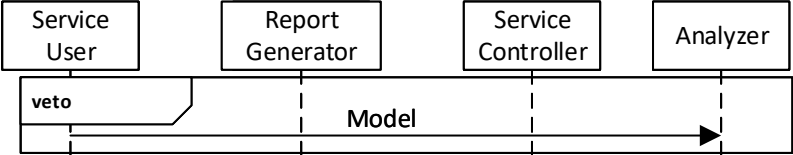




Question 14

Attached





Question 1

Attached



Service
User

Report
Generator

Service
Controller

Analyzer

veto

Model

loop

alt

Model

Nok

Model

Ok

Model

Result

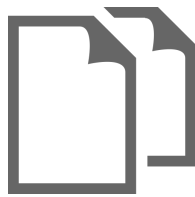
Make report

Report

Report

Question 2

Attached



Service User

Report Generator

Service Controller

Analyzer

veto

Model

loop

alt

Model

Nok

Model

Ok

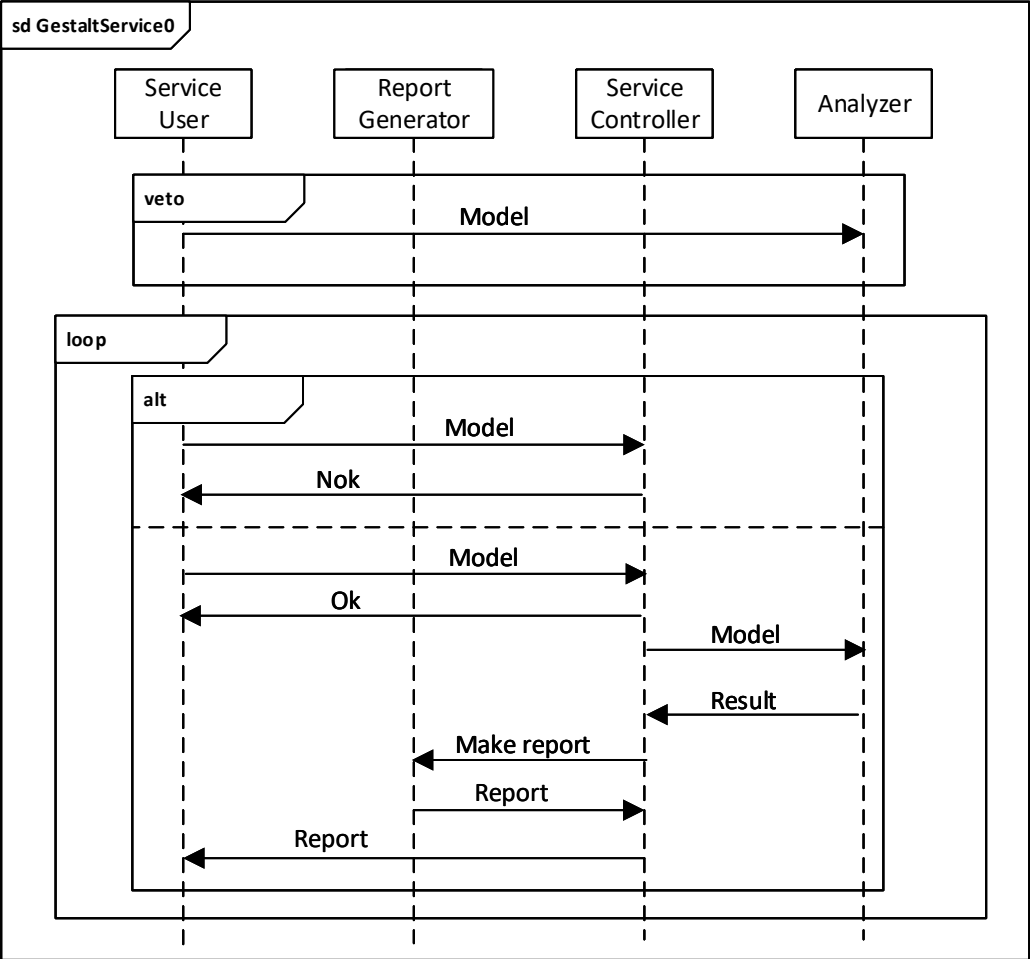
Model

Result

Make report

Report

Report



Question 3

Attached



Service
User

Report
Generator

Service
Controller

Analyzer

veto

Model

loop

alt

Model

Nok

Model

Ok

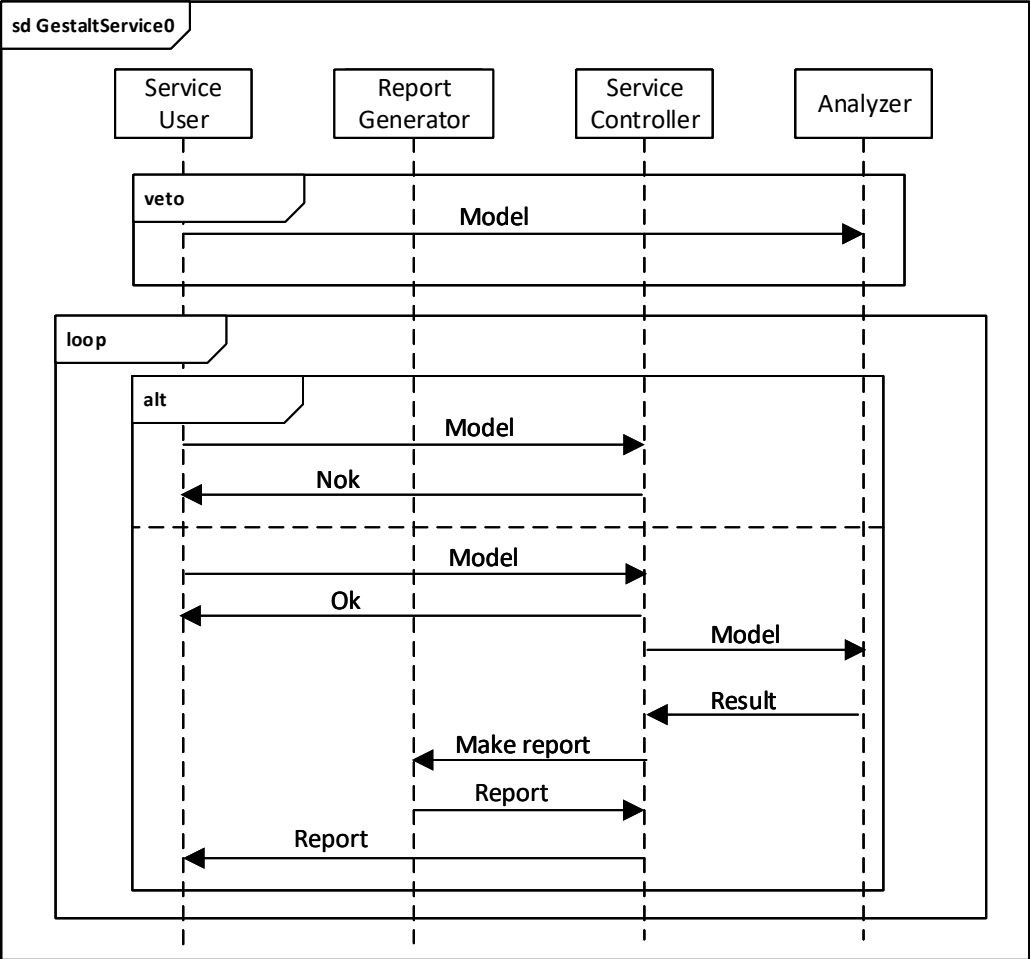
Model

Result

Make report

Report

Report



Question 4

Attached



Service User

Report Generator

Service Controller

Analyzer

veto

Model

loop

alt

Model

Nok

Model

Ok

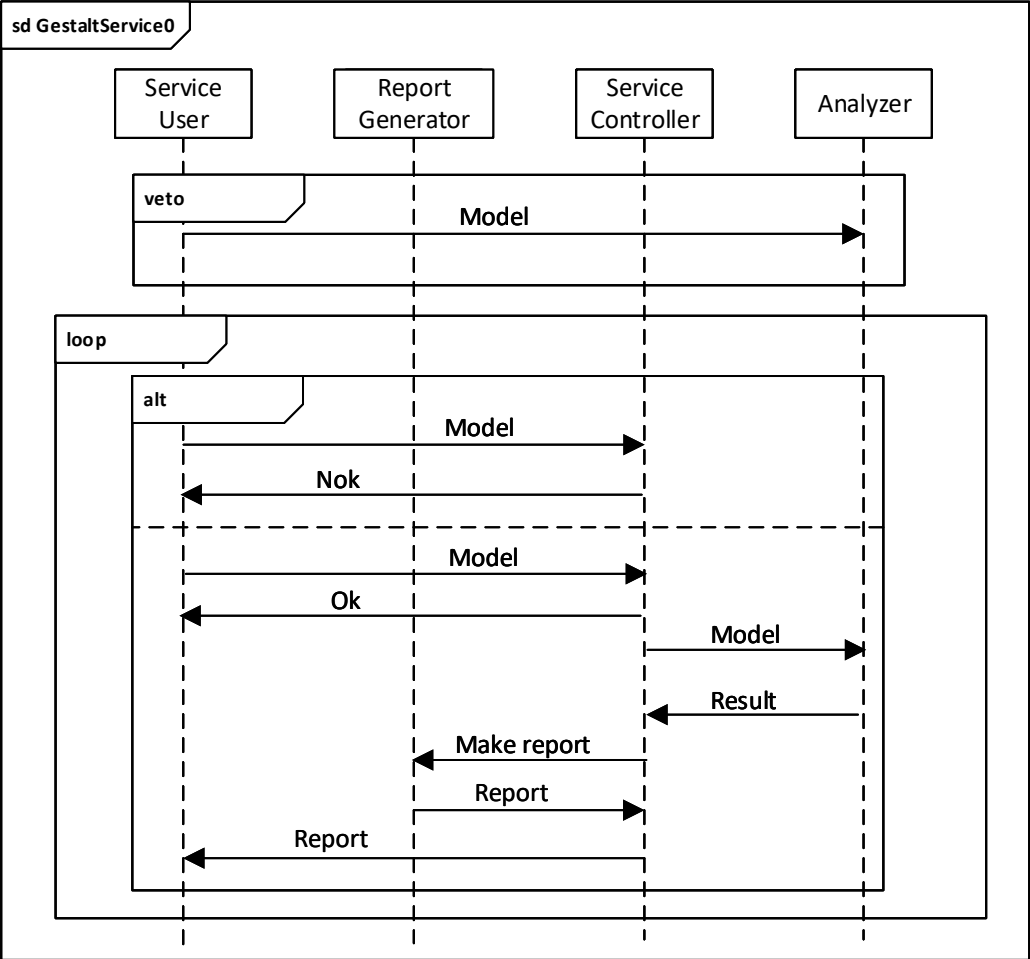
Model

Result

Make report

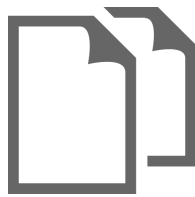
Report

Report

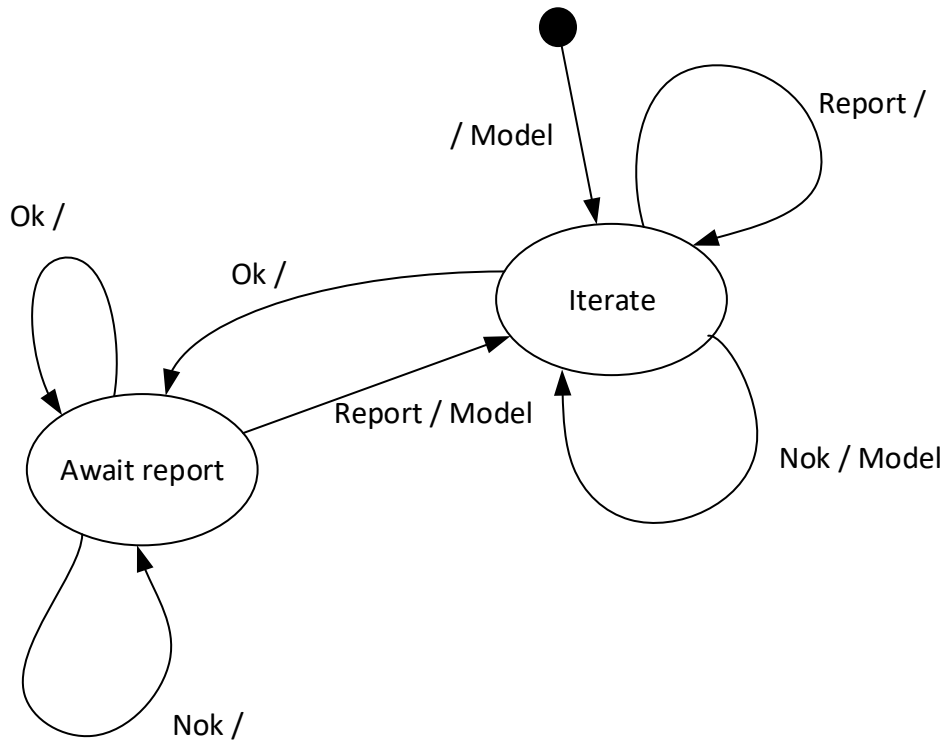


Question 5

Attached



sm Service User

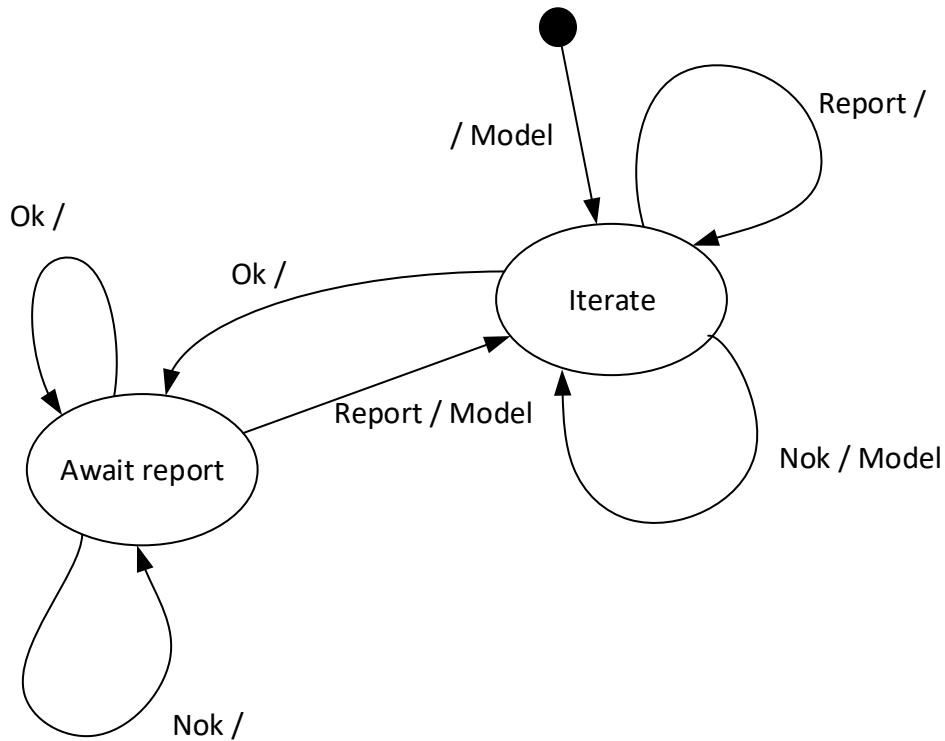


Question 6

Attached



sm Service User

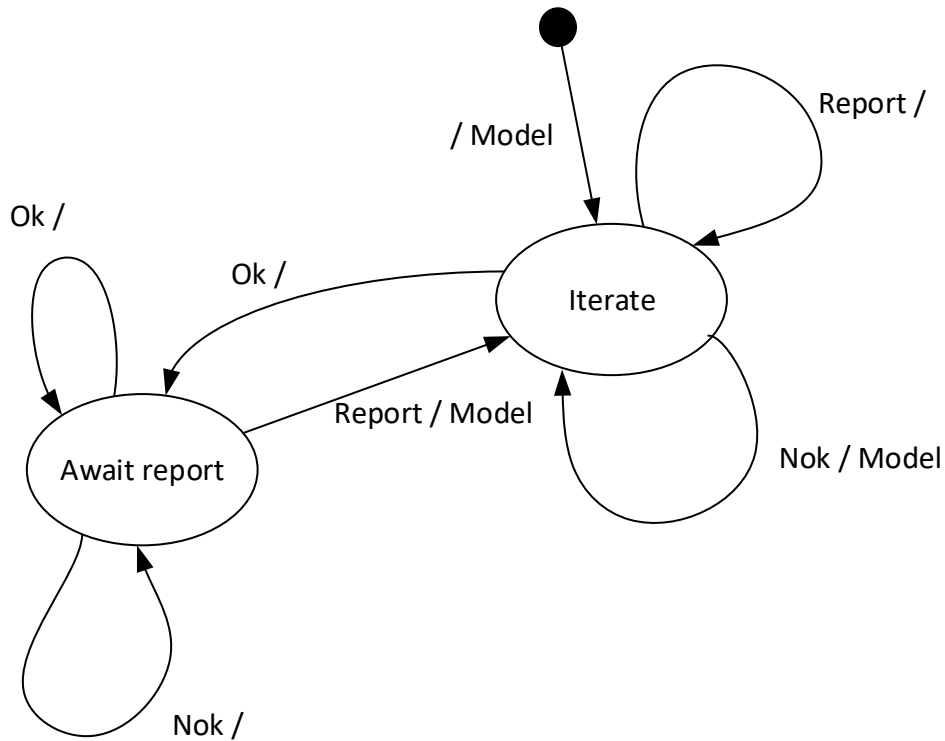


Question 7

Attached



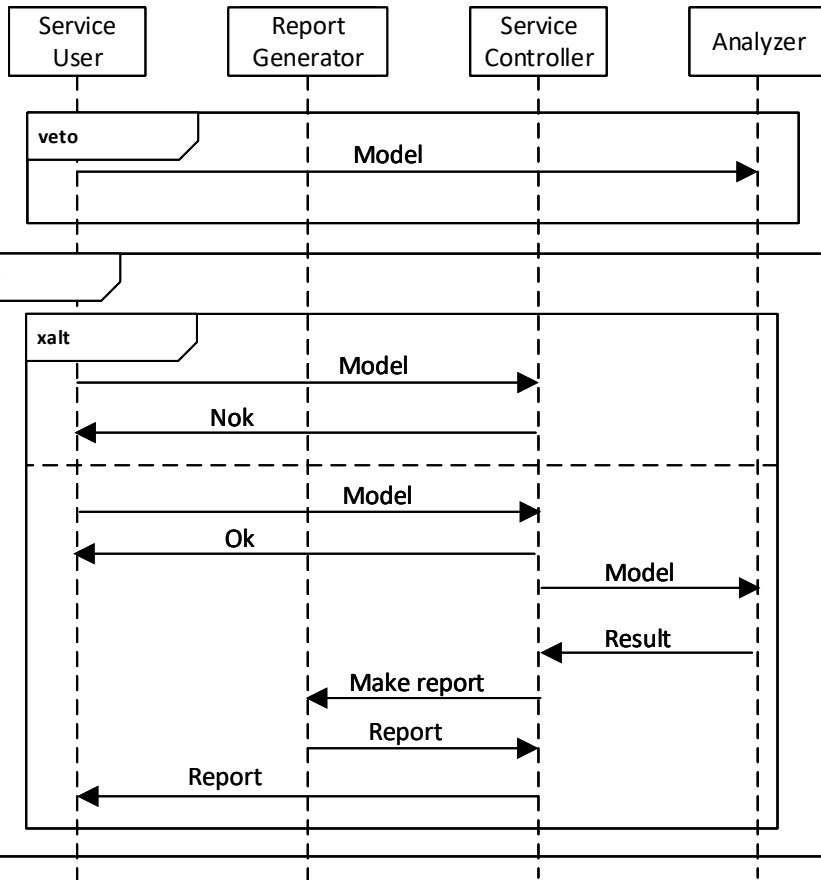
sm Service User



Question 8

Attached





Question 9

Attached



