



Sri Lanka Institute of Information Technology

B.Sc. Honours Degree in Information Technology

Specialized in Software Engineering

Repeat Examination
Year 4, Semester 1 (2022)

SE4010– Current Trends in Software Engineering

Duration: 2 Hours

November 2022

Instructions to Candidates:

- ◆ This paper has 4 questions.
- ◆ Answer all questions in the given booklet.
- ◆ The total marks for the paper is 100.
- ◆ This paper contains 8 pages, including the cover page.
- ◆ Electronic devices capable of storing and retrieving text, including calculators and mobile phones are not allowed.

Question 1**(35 marks)**

- a) “Cloud computing platforms work well for web application startup companies that are starting small but hoping to make it big in a hurry.” Do you agree with this statement? Justify your answer.

(05 Marks)

- b) Briefly explain the terms AWS Region and AWS Availability zone are? (You can use a diagram to explain the answer).

(05 Marks)

- c) Amazon Relational Database Service (Amazon RDS) makes it easy to set up, operate, and scale a relational database in the cloud. List 2 database engines to choose from AWS, as relational database service.

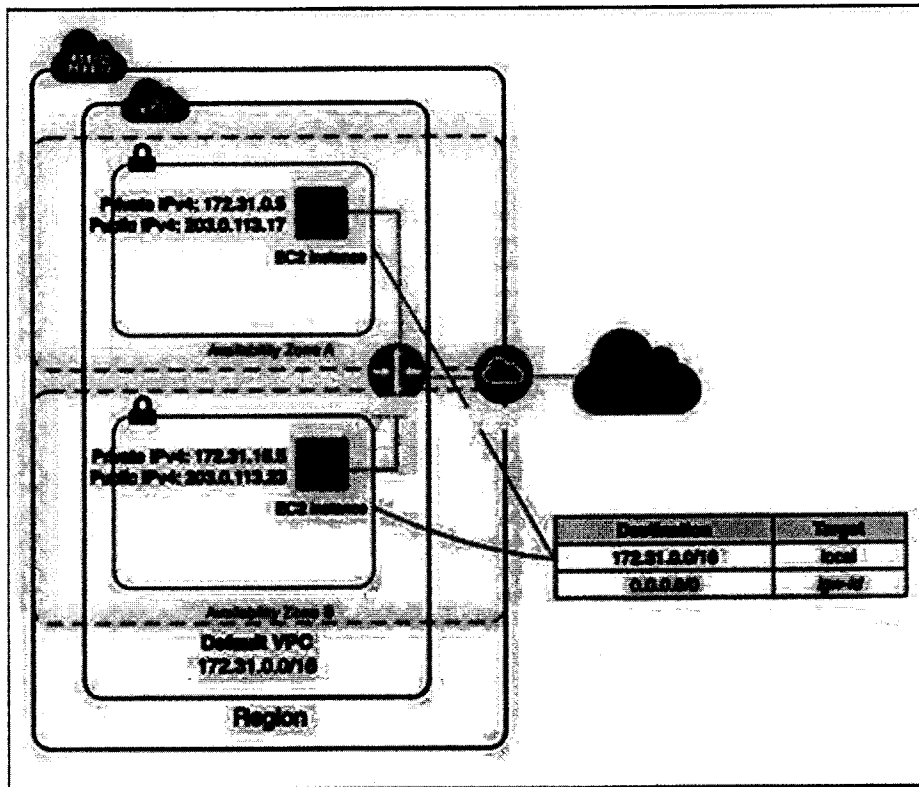
(04 Marks)

- d) Differentiate the terms Vertical scalability and Horizontal scalability

(05 Marks)

- e) **Read the following paragraph and answer below questions i), ii) and iii)**

AWS EC2 instance are setup inside a VPC. Amazon Virtual Private Cloud or rather Amazon VPC enables you to define a virtual network in your own logically isolated area within the AWS cloud. Following shows a sample AWS VPC diagram.



- i) Name 6 VPC components which includes in above AWS VPC. (06 marks)
- ii) Select 3 components from above listed VPC components and briefly explain each component. (What the component actually does) (06 marks)
- iii) In a VPC, when you launch an EC2 instance, you associate one or more security groups with the instance. What does a security group actually do? (04 marks)

Question 2**(15 marks)**

- a) An alert dialog is a useful feature that notifies the user with important information to make a decision or provide the ability to choose a specific action or list of actions. Following is an example for alert dialog code in Flutter.

Write the missing parts in the code given below. When you click on the button **Show Alert**, you will get the alert message as per the figure 01. (Please add your answer for respecting roman number (i to xv))

Ex: i).

ii).

iii)

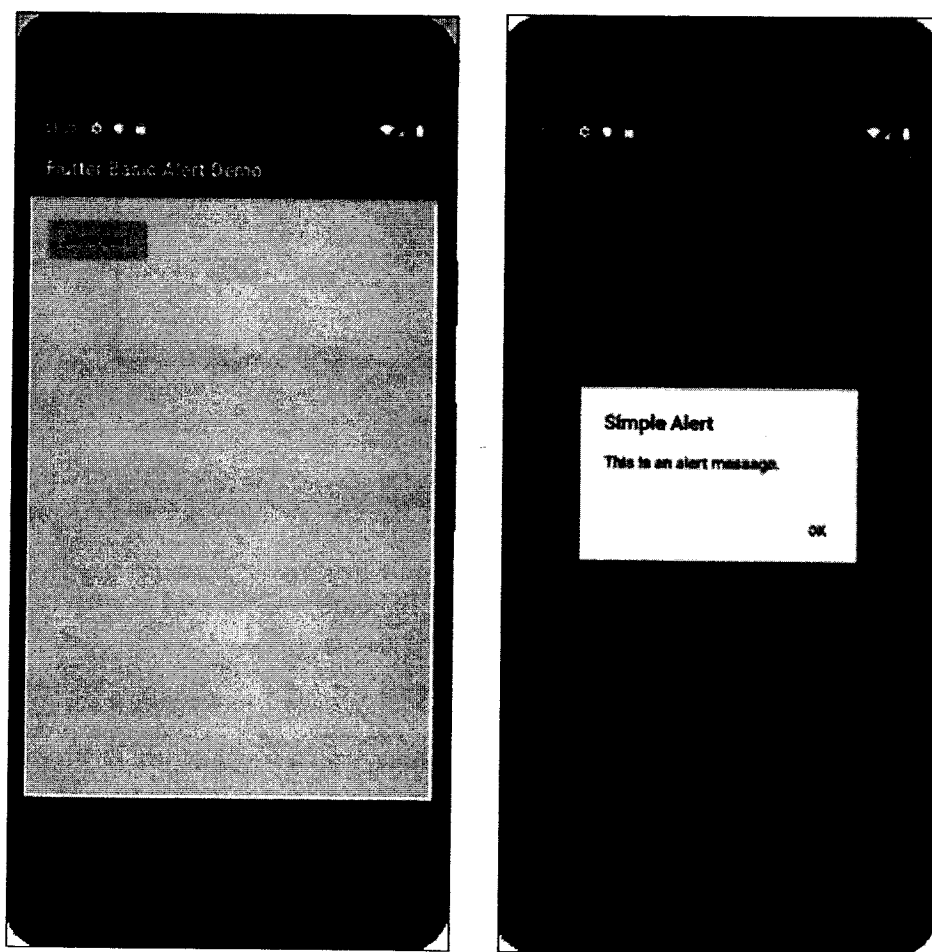


Figure 1: After click on Show alert button, it will popup simple Alert Box.

```

import 'package:flutter/material.dart';

void main() => runApp(MyApp());

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    final appTitle = 'Flutter Basic Alert Demo';
    return i)_____ (
      title: appTitle,
      home: ii)_____ (
        appBar: AppBar(
          title: Text(appTitle),
        ),
        body: iii)_____ (),
      ),
    );
  }
}

class MyAlert extends iv)_____ {
  @override
  Widget build(BuildContext context) {
    return Padding(
      padding: const EdgeInsets.all(20.0),
      child: v)_____ (
        vi)_____ : vii)_____ ('Show alert'),
        viii)_____ : () {
          showAlertDialog(context);
        },
      ),
    );
  }
}

showAlertDialog(BuildContext context) {
  // Create button
  Widget okButton = ix)_____ (
    x)_____ : xi)_____ ("OK"),
    xii)_____ : () {
      Navigator.of(context).pop();
    },
  );

  // Create AlertDialog
  xiii)_____ alert = xiv)_____ (
    title: Text("Simple Alert"),

```

```
        content: Text("This is an alert message."),
        actions: [
            okButton,
        ],
    );

    // show the dialog
    showDialog(
      context: context,
      builder: (BuildContext context) {
        return xv _____;
      },
    );
}
```

(15 Marks)

Question 3**(25 marks)**

Imagine you are a project lead in your company and you get handed over to lead a new ERP project. The users of this application will be the top management and the HR staff. Client wants this application to manage employee data, payroll information, attendance, cash flow, company holiday information for now and the client says there will be new feature requests in the future as well. Further analysis shows that the employee details will not have a standard data structure and may change with time. Furthermore, they want to run reporting services on payroll and finance data of the company which requires to have data stored in a relational database.

- a) The client wants you to write a monolithic application supporting all of the above functionalities. Justify whether you agree with this request or not with mentioning 4 factors.

(08 Marks)

- b) Design and draw a high-level architectural diagram for the above use case and explain your decisions and any assumptions you made.

(10 Marks)

- c) Apply the 12 factors you have learned in classroom for this scenario while building the solution. (Explanation of 5 factors is enough)

(05 Marks)

- d) Does Kubernetes and Docker are same when it comes to functionality? Justify your answer.

(02 Marks)

Question 4**(25 marks)**

- a) "A blockchain based solution is not ideal for a Supply Chain Management application where all writers will be known and multiple writers are involved." Do you agree with this statement? Justify your answer.
(5 Marks)
- b) Jay Jay is a Apparel factory where export quality garment products. They have decided to track the colour of their latest fabric and maintain them in a block chain through the entire journey of factory to consumer. Draw a sample block diagram (at least 3 blocks) with the minimum components needed for a blockchain.
(10 Marks)
- c) John wants to verify 1 BTC with Wayne. Using a diagram illustrate the process of 'Bit Coin verification' process.
(10 Marks)

End of the paper