Middle East Technical University
Northern Cyprus Campus

**CNG 443: Introduction to Object-Oriented Programming
Languages and Systems**

Assignment 3: Question Bank Homework GUI

Learning Outcomes: On successful completion of this assignment, a student will:

• Have used different Swing components to implement an application with a GUI.
• Have practiced how to use event-driven programming.
• Have practiced how to use Java Database Connectivity API.

This assignment is going to be an extension of "Assignment 2" where file input, output operations were used to create a training program. The aim of this assignment is to create a small application which can be used for training in fundamentals of computer science and networks. This time you are going to use a persistent database to keep the necessary information, and will use GUI as an interface for users. This time apart from the (True/False) questions, we are going to have multiple choice questions.

You can use any open source database you like (http://www.apachefriends.org/en/xampp.html). Make sure that you design your database properly.

Part 1:

The part where (True/False) questions are implemented is quite similar to the first assignment. However instead of the command line interaction you will use GUI. You are free to use components such as Buttons, Checkboxes, as you wish.

Your program will have 20 True/False questions in total. The questions as well as answers to each question will be held in database. Sample questions are provided below as well as the answers. You can organise the outlook of the questions as you wish.

---

1. A selection sort compares adjacent elements and swaps them if they are in the wrong order. (False)
2. Main memory holds its data if the computer is turned off. (False)
3. The body of a while loop may never execute. (True)
4. Binary is considered the best number base for a computer. (True)
5. Browsers are programs that provide access to Web resources. (True)
6. Network software is based on layered models. (True)
7. Addresses are needed in every layer of the network communication. (False)
8. All network connectors are implemented in software. (False)
9. A client/server network is a network in which one computer is a client and provides services to the other computers, which are called servers. (False)
10. A satellite is a type of wired communications media. (False)
11. The compiler will catch all your programming mistakes. (False)
12. A repeater is a device that receives a radio signal, strengthens it, and sends it on. (True)
13. WiFi is a wireless communication technology that uses red light to send and receive information. (False)
14. A WAN covers a large geographic distance, such as a state, a country. (True)
15. The main difference between infrared and Bluetooth transmission is that Bluetooth needs line of site whilst infrared does not. (False)
16. In a virtual circuit packet-switched subnet, all packets that belong to a logical connection can follow the same path through the network. (True)
17. Ciphertext is data before any encryption has been performed. (False)
18. Each pass of a bubble sort selects one item and puts it in its final sorted position. (False)
19. Synchronous Time Division multiplexing will not allocate a time slot to a source that is idle. (False)
20. Dumb terminals are used for simple data entry and data retrieval operations. (True)

Part 2:

In the second part of the assignment you will have multiple choice questions (each question will be given five options). Again it is up to you the way you would like to organise your database for the questions and the answers. Also it is up to you the way you organise the outlook of your interface, and the components you would like to employ. A sample question may look like following.

Which of the following condition is used to transmit two packets over a medium at the same time?
- ○ Contention
- ◉ Collision
- ○ Synchronous
- ○ Asynchronous
- ○ None of the above

For each question an extra option will be given to learn the correct answer of the question. A further option will be provided for explanations (**User can choose to see the explanation or not**). Please see the example below.

Which of the following condition is used to transmit two packets over a medium at the same time?
- ○ Contention
- ◉ Collision
- ○ Synchronous
- ○ Asynchronous
- ○ None of the above

View Answer

☐ **Show Eplanation**

Which of the following condition is used to transmit two packets over a medium at the same time?
- ○ Contention
- ◉ Collision
- ○ Synchronous
- ○ Asynchronous
- ○ None of the above

Answer: Collision

Explanation: Collision is the result of two devices attempting to transmit data at the same time

View Answer

☑ **Show Explanation**

The users will not be allowed to change the answer of their questions, after they see the correct result.

Part 3:

The grade of each user (overall grade of the test) will also be presented to the users at the end of the test. Please note that each True/False question is 3 marks, where multiple choice questions are 5 marks. One option is to present in percentages, for example %50. An alternative, and a better way to display the results would be to use bar charts, or pie charts to show how many marks are scored from True/False questions and how many marks were scored from multiple choice questions. Sample multiple choice questions are provided below as well as the answers.

1) Which of the following condition is used to transmit two packets over a medium at the same time?
A. Contention
B. Collision
C. Synchronous
D. Asynchronous
E. None of the above

Explanation: Collision is the result of two devices attempting to transmit data at the same time

2) In full duplex data transmission, both the sender and the receiver
A. cannot talk at once
B. can receive and send data simultaneously
C. can send or receive data one at a time
D. can do one way data transmission only
E. None of the above

Explanation: full-duplex (FDX), or sometimes double-duplex system, allows communication in both directions

3) Which of the following TCP/IP protocol is used for transferring electronic mail messages from one machine to another?
A. FTP
B. SNMP
C. SMTP
D. RPC
E. None of the above

Explanation: Simple Mail Transfer Protocol

4) Which of the following device is used to connect two systems, especially if the systems use different protocols?
A. hub
B. bridge
C. gateway
D. repeater
E. None of the above

Explanation: All others require same protocol

5) A distributed network configuration in which all data/information pass through a central computer is
A. bus network
B. star network
C. ring network
D. Point-to-point network
E. None of the above

Explanation: The topology where the central node is responsible from transmission is star topology.

6) What part of 192.168.10.51 is the Network ID, assuming a default subnet mask?
A. 192
B. 192.168.10
C. 0.0.0.5
D. 51
E. None of the above

Explanation: This is a class C address default form is N.N.N.H

7) In CRC there is no error if the remainder at the receiver is _____.
A.equal to the remainder at the sender
 B.zero
C.nonzero
D.the quotient at the sender

Explanation: The protocol assumes error free transmission if the remainder is zero

8) Usually, it takes 10-bits to represent one character. How many characters can be transmitted at a speed of 1200 BPS in a second?
A.10
B.12
C.120
D.1200
E.None of the above

Explanation: 1200/10=120

Extra Requirements

- The questions will be provided in a random order. Each time the program runs the order of questions will be different (a **mixed** collection of True/False and multiple choice questions). Each question will appear only once.
- As mentioned in explanations for multiple choice section, the users **will not be allowed to change the answer of their questions, after they see the correct result**.

Assessment Criteria

The assignment will be marked as follows:

Aspect	Marks (Total 20)
Fully working interface for True/False Questions	2
Fully working interface for multiple choice questions	3
Random access to the questions	2
Correct matching with answers	2
Correct mechanism to provide feedback on questions	4
The users will not be allowed to change the answer of their questions, after they see the correct result	3
Presentation of grades percentage	1
Presentation of grades percentage bar charts/pie charts	3

Half working	0.2
Fully working	0.2
Database (addition deletion of new questions)	0.3
Good Javadoc comments	0.1
Good and neat test results	0.2