MCAST

Malta College of Arts, Science & Technology

INSTITUTE OF INFORMATION AND COMMUNICATION TECHNOLOGY

Mobile and Applications Development

B Sc Year 1 – Software Part Time

Assignment 2 [Home]

Instructions to Students

- The deadline for this assignment is **30th December 2020 (23:29)**
- Upload the assignment on Teams
- Fill in the assignment Cover Sheet and Answer Sheets appropriately
- Copying is strictly prohibited and will be penalized through a referral and other disciplinary procedures
- The assignment sheet should be fully completed with the details
- Save your work in a folder and call it **LastnameFirstname_Assignment2**, where the Last name and First name must be replaced with your last and first names: e.g.: BrownJohn_Assignment1
- Include all relevant files for each task
- Late assignments are not accepted

Interactive Mobile Development

This assignment consists of 2 Sections:

- Section 1: You are required to create Bluetooth Device scanner
- Section 2: You are required to create an SMS Authentication Application for Android

NB: Each task described below outlines the requirements for both application.

Section 1: Bluetooth Device Scanner

Create a Bluetooth scanner and list all nearby devices in a RecylerView.

15 Marks

KU7 – Outline Specific commands which might be used to ignite PAN interfaces on a mobile device		
a. Use the appropriate Permissions	1 Mark	
b. Check if Bluetooth is enabled	3 Marks	
c. Show a Message if Bluetooth is not enabled	1 Marks	
SE2 – Evaluate with a test plan a mobile PAN application		
a. Display list of all nearby Devices	5 Marks	
b. Use a Recycler View	5 Marks	

Section 2: - SMS Authentication Application

You are required to create an SMS Authentication Application for Android. This application should be used to authenticate phone numbers automatically by send a code by SMS to another phone which then will verify. Test the application on 2 Emulators. Your application should include the following functionalities:

Phone 1: Sending Code and Verification

1. The user should enter a phone number to verify and click a Button to verify
2. On button click Load the Sim card IMSI number and use it as a verification code
3. Store the code together with the phone number online – a database of your choice (eg. Firebase)
4. Send an SMS with the code to the number entered in step 1
5. Once Verified store in local storage

Phone 2: Verifying Code

1. Use Broadcasts to read the correct SMS. Make sure to ignore any other SMSs not related
2. Load the Code received
3. Verify the code by searching online using the phone number
4. If verified send a message back with the code received and the text *"Verified"*

Both Phones

1. The application should only work if the phone is connected to the internet
2. Use a SnackBar if not connected
3. Make use of broadcast to enable the Verify Button one the device is connected to the internet
4. Use a RecylcerView to list all verified numbers including Data and Time of verification

Task 1 – KU6 – Mobile applications making use of web based services

Search for a cloud service with an API available to store codes and phone numbers.

- Describe how this service can be used (technically) in an Android application (Mention any classes/methods required)
- Give a technical description of how this service stores data

5 Marks

KU6 – Describe a mobile Application use-case requiring the use of a web based services		
a. Selection of a Cloud Service	1 Mark	
b. How this service can be used?	2 Marks	
c. How this services stores data?	2 Marks	

Task 2 – KU4 – Basic wireless protocols

- Describe 2 Classes in Android which deal with Wi-Fi Connectivity
- Which methods return the SSID and IP address obtained
- Outline and describe 3 other methods within the classes mentioned

5 Marks

KU4 – Illustrate the basic wireless protocols used within a smart mobile device for Internet Protocol Connectivity		
a. Describe 2 classes which deal with Wi-Fi	2 Marks	
b. Which methods return the SSID and IP address	1 Mark	
c. Describe 3 other methods	2 Marks	

Task 3 – KU 5 –Using IP data network

Your Application should

- Check whether the device is connected to the internet
- By Making use of a SnackBar display a message to the user if not connected

5 Marks

KU5 – Outline specific command which might be used to ignite IP data network interfaces on a mobile device		
a. Check whether the device is connected to the internet	3 Marks	
b. Correct use of SnackBar	2 Marks	

Task 4 – AA2 –Ignite IP data network interface

- Make use of Broadcast to Hide the SnackBar
- Enable the verify Button once Connected

7 Marks

AA2 – Produce OS relevant code to ignite IP data Network interface hardware		
a. Make correct use of Broadcasts once Wi-Fi connection is established	5 Marks	
b. Enable the Verify Button	2 Mark	

Task 5 – AA3 –Implement Web Service API

- Store correctly the IMSI number and phone number on a Web Service of your choice

7 Marks

AA3 – Produce OS relevant code to implement a Web Service API		
a. Store IMSI number	4 Marks	
b. Store Phone number	3 Marks	

Task 6 – AA4 –Application Logic using Device Sensors

- Load the Code Received
- Verify code

7 Marks

AA4 – Construction application logic utilize device sensors		
a. Load the Code Received	1 Marks	
b. Verify Code	4 Marks	
c. Send SMS back with the verification message	2 Mark	

Task 7 – SE1 &SE3 –Test for WWW service APP and Telephony

Test Correctly different types of message i.e. verified, not verified, unrelated messages and outline the outcome in a Table format. Discuss any errors occurred and course of action if any. Make correct use of Permissions as required by API 23.

Make correct use of Broadcast receivers where SMS are received.

20 Marks

SE1 – Evaluate functionality with a test plan for a mobile World Wide Web service application		
a. Make Correct use of AyncTasks where required	3 Marks	
b. Test Correctly	5 Marks	
c. Permission meet API23 required	2 Marks	
SE3 – Evaluate functionality with a test plan for a telephony service Application		
a. Broadcast Receiver for SMSs Received	3 Marks	
b. Use the Correct Intent Filters	2 Marks	
c. Save all verified numbers in local storage and display in a Recycler View	3 Marks	
d. Test SMS send and SMS Received	2 Marks	