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| ANDROID & IoT | | | |
| Day/Session | Topic | Description | Task |
| 1 | **Introduction** | Introduction on Android – Need of Android – Features available – Advantages –  Android application over Java application – Prerequisite for Android application –  Overview – History of Android |  |
| 2 | **Setting up the IDE** | Installing Android IDE – Eclipse/Android Studio – Discussing about the environment variables - Installation of JDK and SDK– Setting up IDE for creating an application – various panel explanation. |  |
| 3 | **Introduction to File System in Android** | Creating a Hello World program – Introduction to Text Views – Creating an xml(Design) file, JavaScript (Process) and Manifest(Execute) and making changes – Running an Android application in Emulator | **Task1**:create a hello world program and flash it to Android mobile |
| 4 | **Text views** | Configuring your Mobile to run a sample application – Solving the issues while running the app in real time gadgets (ADB Integration) – Enabling Developer options in Gadgets - Driver Installation. | **Task2**: Create multiple Text views with multiple colors and multiple size and fonts |
| 5 | **Layouts** | UI tool explanation – Basic widgets for design – Overview of Views, Layouts, Buttons and other transitions – Views – Types of Views – Layouts – Types of layouts | **Task3** : Task involving layouts and nested Layouts |
| 6 | **Widgets** | Buttons – Radio buttons- Rating Bar- Progress bar –Time and date -List view - Grid view- Integration of Basic Widgets into Java – importing necessary libraries -Controlling the attributes during execution | **Task4**: Task involving text views and buttons.  **Task5**: Create a simple application With multiple Widgets |
| 7 | **Intents & Activity** | Creating multiple pages – Integrating and Navigating from one to the other (Intents) – Activity - Lifecycle of an Activity | **Task6:** Create a multi-page application and move from one page to other |
| 8 | **Shared Preference & Camera/Gallery API** | Shared Preference-necessity- usage areas-Implementation  Accessing image from Camera API and gallery- working with the mobile resource-transferring of control between activities | **Task7:** Create an application with a Login screen containing Username and Password  and then logging out of the app. enabling a new user login.  **Task8** **:**Setting an Image from gallery/Camera as profile display Pic for the above Task |
| 9 | **Menu &Toast** | Creating Menu – Adding items in Menu – Creating a string list – Creating any customized list view-Adding items in Action Bar-Customizing Action Bar-Notifications | **Task9:** Create an Options menu with multiple items and toast the selected item’s name |
| 10 | **Text to Speech and Speech to Text** | Introduction to TTS engine-mechanism –implementation-Speech to text introduction –working –implementation | **Task10:** Performing various action using voice command |
| 11 | **Google Apps** | Working with Google maps – How to buy an API key for a Project – Working with multiple markers – Changing colors – Working with multiple map types (Hybrid, Terrain, Satellite) – Working with GPS location – Obtaining location – Locating the Latitude and Longitude in Maps | **Task11**:Obtain the current location and set the location in Google maps(Place the marker in current location) |
| 12 | **List and Grid view** | Introduction- mechanism –implementation of List and Grid view –Introducing different widgets | **Task12:** Implementing a grid / list view with multiple widget |
| 13 | **Database** | Working with Database – Types of database – SQLite – My SQL-basic PHP scripts for CRUD operations in Database-WAMP Server Installation - Local server Concepts –Database query Statements | **Task13**: Creating a Contact Manager using Database |
| 14 | **Working with in built Sensor** | Working with Inbuilt Sensors-Accelerometer-Gyroscope-Proximity sensor-Temperature SensorTouch Sensor-IR Sensor –Vision Sensor –Barometer –Humidity Sensor-Fingerprint sensor – Accessing data from Sensors – Adding the sensor data to List view – Check Sensor availability | **Task14:** working with various sensor to perform a particular task |
| 15 | **Bluetooth** | Working with Communication mediums – Bluetooth – Listing Paired devices – Pairing to a new device – Sending and receiving data from the device | **Task15:** Pair a new device using Bluetooth and send data through the same. |
| 16 | **Wifi** | Wi-Fi – Working with Wi-Fi – Connecting to the network with the help of SSID – Listing the available networks – Connecting to a new network – Sending and receiving data from the network | **Task16**: Connect to the existing network using Wi-Fi. Send and receive data to the network |
| 17 | **Animations** | Working with Various animations- create a basic animations in app-interfacing various module –together with proper animation | **Task 17:** Task6: Controlling the Animation using voice recognition |
| 18 | **Working with already created app** | Download a app from the internet –Enhance the look and feel of the app and enhancing the functionality-Solving the errors –making the app run with current settings-installing necessary libraries. | **Task 18:** Download a app from the internet and enhance its features. |
| 19&20 |  | **Task 19:** Create a an app for the given problem statement.(varies from team to team) –this will include at least three modules. |  |
| 21 | **Introduction to Controllers and other Peripheral** | Sensors-types of Sensors- Basic mechanism-Analog and Digital sensors-ADC-DAC.Actuators- LED-Buzzer-DC Motors and its classification-AC Motor and its classification-Brushless DC motor-Stepper Motor-Servo Motor.  Controller and Processor – Atmega 328 controller introduction-reason for selecting Atmega series-Pin diagram Explanation. |  |
| 22 | **Introduction to Embedded Coding** | Introduction to programming-Basics of C programming-if-else if-switch-for-while-do-Setting up the IDE-Explanation to Various modules in IDE-Running a Sample program with IDE |  |
| 23 | **Classification of Inputs and Outputs** | Classification of Input and Output-Digital Input-Digital Output-Analog Input – Analog output  Digital Output-various Digital output control-buzzer- Basic Led Control. | **Task 20** -small basic task with LED and Buzzer will be given to familiarize the Digital Output |
| 24 | **Digital inputs and Sensor Interfacing** | Digital input -IR sensor- Introduction -Mechanism-Interfacing with Microcontroller.  Ultrasonic Sensor-Introduction-mechanism- Interfacing with Microcontroller. | **Task 21:** Implementing an application using IR sensor |
| 25 | **Analog Input and Analog output** | Analog output –controlling the dimming value of LED-Buzzer amplitude control.  Analog Input – potentiometer –reading analog values-controlling the Led based on POT-introduction to serial monitor. | **Task 22:** small basic task will be given to familiarize the Analog Input  **Task 23**:small basic task will be given to familiarize the Analog Output |
| 26 | **IoT-Introduction** | Introduction to IoT-Basic architecture – WAMP Server installation – Database creation using My SQL – CRUD operation using My SQL – PHP script creation and execution. | **Task 24:** Basic CRUD operations in database using PHP scripts |
| 27 | **IoT- Client** | ESP8266 introduction – Working – Basic networking concepts – AT commands of ESP8266 – Interfacing ESP8266 with microcontroller – Implementing a basic client using ESP8266. | **Task 25:** Sending sensor data to the Cloud and accessing it via web server |
| 28 | **IoT- Server** | Implementing a server using ESP8266 – Receiving commands from client – Controlling the device from remote | **Task 26:** Creating a web based application to control various devices using microcontroller |
| 29 | **IoT server and client** |  | **Task 27:** Creating an IoT based system – Creation of a Server and a client in a single device using ESP8266 |
| 30 | **Wearable app** | Task28 : Creating a wearable app with embedded hardware .  Doubts clarification. |  |