**CODE FOR SMART HELMET**

**ESP32 Microcontroller Code (using MicroPython)**

import urequests

import machine

import time

# Initialize sensors

pulse\_sensor = machine.ADC(machine.Pin(32))

temp\_sensor = machine.ADC(machine.Pin(33))

dht22\_sensor = DHT22(machine.Pin(14))

vibration\_sensor = machine.ADC(machine.Pin(34))

# Function to read sensor data

def read\_sensors():

pulse = pulse\_sensor.read()

temperature = temp\_sensor.read()

dht22\_sensor.measure()

temp = dht22\_sensor.temperature()

hum = dht22\_sensor.humidity()

vibration = vibration\_sensor.read()

return {

'pulse': pulse,

'temperature': temperature,

'dht\_temp': temp,

'humidity': hum,

'vibration': vibration

}

# Function to send data to server

def send\_data(data):

url = 'http://your-server-address/api/data'

headers = {'Content-Type': 'application/json'}

response = urequests.post(url, json=data, headers=headers)

print(response.text)

# Main loop

while True:

sensor\_data = read\_sensors()

send\_data(sensor\_data)

time.sleep(10) # send data every 10 seconds

**Mobile Application Code**

import 'package:flutter/material.dart';

import 'package:http/http.dart' as http;

import 'dart:convert';

void main() {

runApp(MyApp());

}

class MyApp extends StatelessWidget {

@override

Widget build(BuildContext context) {

return MaterialApp(

title: 'Smart Helmet App',

theme: ThemeData(

primarySwatch: Colors.blue,

),

home: DataPage(),

);

}

}

class DataPage extends StatefulWidget {

@override

\_DataPageState createState() => \_DataPageState();

}

class \_DataPageState extends State<DataPage> {

Map<String, dynamic> data;

@override

void initState() {

super.initState();

fetchData();

}

fetchData() async {

final response = await http.get('http://your-server-address/api/data/latest');

if (response.statusCode == 200) {

setState(() {

data = json.decode(response.body);

});

} else {

throw Exception('Failed to load data');

}

}

@override

Widget build(BuildContext context) {

return Scaffold(

appBar: AppBar(

title: Text('Smart Helmet Data'),

),

body: data == null

? Center(child: CircularProgressIndicator())

: ListView(

children: <Widget>[

ListTile(

title: Text('Pulse'),

subtitle: Text(data['pulse'].toString()),

),

ListTile(

title: Text('Temperature'),

subtitle: Text(data['temperature'].toString()),

),

// Add more ListTile widgets for other data fields

],

),

);

}

}