This solution consist of 2 part; Web and Mobile Applications

1. Web (HTML, jQuery, Bootstrap (CSS))

A. Question 1

```
<script>
    $(document).ready(function () {
        var listOfNumbers = [];

        $('#lets_go-question_1').click(function(){
            $("#show-question_1").modal('show');
        });

        $('.input_number').on('input', function(e) {
            listOfNumbers = [];
            var arrNumbers = [];

            for (var i = 1; i <= 8; i++) {
                var value = $('#array_number_' + i).val();
                if (value != '') {
                    arrNumbers.push(value);
                }
            }

            if (arrNumbers.length > 0) {
                for (const number of arrNumbers) {
                    if (/\d*9\d*/.test(number)) {
                        break;
                    }
                    else if(number % 2 || number == 0) {
                        listOfNumbers.push(' Odd');
                    }
                    else{
                        listOfNumbers.push(' ' + number);
                    }
                }
            }

            $("#answer-question_1").text(listOfNumbers);
        });
    });
</script>
```

B. Question 2

```
$('#text-question_2').keyup(function(event){
    var countEachVowel = 0;
    var countEachNumber = 0;
    var countEachConsonant = 0;
    var countEachSpecialChar = 0;
    var oneCharVowel = {};
    var oneCharConsonant = {};
    var oneCharSpecialChar = {};
    var oneCharNumber = {};
    var longestWordinList = '';
    var wordConstructed = '';
    var listOfLongestWord = [];
    var value = $('#text-question_2').val();

    for (var i = 0; i < value.length; i++) {
        var char = value[i];

        if (char == 'a' || char == 'e' || char == 'i' || char == 'o' || char == 'u') {
            countEachVowel++;
            oneCharVowel[char] = (oneCharVowel[char] ?? 0) + 1;

            wordConstructed += char;

        }
        else if (/[!@#$%^&*(),.?":{}|<>_-\s]/.test(char)) {
            countEachSpecialChar++;
            if (/\s/.test(char) || char === ' ') {
                char = '[ Blank Space ]';
            }

            oneCharSpecialChar[char] = (oneCharSpecialChar[char] ?? 0) + 1;

            listOfLongestWord.push(wordConstructed);
            wordConstructed = '';
        }
        else if (/\d/.test(char)) {
            countEachNumber++;
            oneCharNumber[char] = (oneCharNumber[char] ?? 0) + 1;

            listOfLongestWord.push(wordConstructed);
            wordConstructed = '';
        }
        else {
            countEachConsonant++;
            oneCharConsonant[char] = (oneCharConsonant[char] ?? 0) + 1;

            wordConstructed += char;
        }
    }


    if (wordConstructed != '') {
        listOfLongestWord.push(wordConstructed);
    }

    listOfLongestWord.forEach(word => {
        if (word.length > longestWordinList.length) {
            longestWordinList = word;
        }
    });

    $('#vowels').val(JSON.stringify(oneCharVowel));
    $('#consonants').val(JSON.stringify(oneCharConsonant));
    $('#numbers').val(JSON.stringify(oneCharNumber));
    $('#otherChars').val(JSON.stringify(oneCharSpecialChar));
    $('#longestWord').val(longestWordinList);
});
```

C. Question 3

```
$(document).ready(function () {
    var selectShape = '';
    var height = 0;
    var length = 0;

    function resetDimension() {
        height = 0;
        length = 0;

        $('#height').val(0)
        $('#length').val(0)
    }

    $('#div-length, #div-height').hide();
    $('#div-shape').hide();

    $('#lets_go-question_3').click(function(){
        $("#show-question_3").modal('show');
    });

    $('#select_shape').change(function () {
        selectShape = $('#select_shape').val();

        switch (selectShape){
            case 'square':
                resetDimension();
                $('#div-length').show();
                $('#div-height').show();
                break;
            case 'triangle':
                resetDimension();
                $('#div-length').hide();
                $('#div-height').show();
                break;
            case 'diamond':
                resetDimension();
                $('#div-length').hide();
                $('#div-height').show();
                break;
            default:
                resetDimension();
                $('#div-length, #div-height').hide();
                break;
        }

        updateShape();
    });

    $('#height, #length').on('input' , function () {
        height = parseInt($('#height').val());
        length = parseInt($('#length').val());
        updateShape();
    });
```

```
function updateShape() {
    $('#div-shape').show();
    var shapeString = '';

    if (selectShape == 'square') {
        for (var i = 0; i < height; i++) {
            var row = '';
            for (var j = 0; j < length; j++) {      You, 2 hours ago • que
                row += '*';
            }
            shapeString += row + '\n';
        }
        $('#shape').val(shapeString);
    }
    else if (selectShape == 'triangle') {
        for (var i = 0; i < height; i++) {
            var row = '';

            for (var j = 0; j < height - i - 1; j++) {
                row += ' ';
            }
            row += '';

            for (var j = 0; j <= i; j++) {
                row += '*';
            }
            for (var j = 0; j < i; j++) {
                row += '*';
            }
            shapeString += row + '\n';
        }
        $('#shape').val(shapeString);
    }
    else if (selectShape == 'diamond') {
        for (var i = 0; i < height; i++) {
            var row = '';
            for (var j = 0; j < height - i; j++) {
                row += ' ';
            }
            for (var j = 0; j <= i; j++) {
                row += '*';
            }
            for (var j = 0; j < i; j++) {
                row += '*';
            }
            shapeString += row + '\n';
        }


        for (var i = height; i > 0; i--) {
            var row = '';
            for (var j = 0; j < height - i; j++) {
                row += ' ';
            }
            for (var j = 0; j <= i; j++) {
                row += '*';
            }
            for (var j = 0; j < i; j++) {
                row += '*';
            }
            shapeString += row + '\n';
        }
        $('#shape').val(shapeString);
    }
    else {
        $('#div-shape').hide();
    }
}
```

D. Question 4

```
$(document).ready(function () {
    var filteredInput = '';
    var totalValue = '';

    $('#lets_go-question_4').click(function(){
        $("#show-question_4").modal('show');
    });

    $('#reset').click(function(){
        $('#input_calculator').val('');
        $('#output_calculator').val('');
    });

    $('#delete').click(function(){
        filteredInput = filteredInput.substring(0, filteredInput.length - 1);
        $('#input_calculator').val(filteredInput);
        $('#output_calculator').val(filteredInput);
    });

    $('#input_calculator').keyup(function () {
        var input = $(this).val();
        filteredInput = input.replace(/[^\d*/+-]/g, '');
        $('#input_calculator').val(filteredInput);
        $('#output_calculator').val(filteredInput);
    });

    function handleOperatorClick(value) {
        var operators = ['+', '-', '*', '/'];
        var lastChar = filteredInput.substr(filteredInput.length - 1);

        if (!operators.includes(lastChar)) {
            filteredInput += value;
        }

        $('#input_calculator').val(filteredInput);
        $('#output_calculator').val(filteredInput);
    }


    $('#plus').click(function () {
        handleOperatorClick('+');
    });

    $('#minus').click(function () {
        handleOperatorClick('-');
    });

    $('#times').click(function () {
        handleOperatorClick('*');
    });

    $('#divide').click(function () {
        handleOperatorClick('/');
    });

    $('.calculator_operator').click(function () {
        $('#input_calculator').focus();
    })


    $('#calculate').click(function () {
        totalValue = eval(filteredInput);
        $('#output_calculator').val(totalValue);
    })
});
```

E. Question 5

```
$(document).ready(function () {
    var localFirstName = localStorage.getItem('first_name');
    var localLastName = localStorage.getItem('last_name');
    if(localFirstName != null && localLastName != null){
        $('#guest_name').text('Hello,' + localFirstName + ' ' + localLastName);
    }

    var registerForm = {};

    $("#register-button").click(function (e) {
        localStorage.clear();

        var first_name = $('#firstName').val();
        var last_name = $('#lastName').val();
        var gender = $('input[name=genderOptions]:checked').val();
        var email = $('#emailAddress').val();
        var phone = $('#phoneNumber').val();
        var subscription = $('#subscription-plan').val();

        $('#modal-first_name').text(first_name);
        $('#modal-last_name').text(last_name);
        $('#modal-gender').text(gender);
        $('#modal-email').text(email);
        $('#modal-phone').text(phone);
        $('#modal-subscription').text(subscription);

        registerForm = {
            first_name: first_name,
            last_name: last_name,
            gender: gender,
            email: email,
            phone: phone,
            subscription: subscription,
        };

        $("#show-details").modal('show');
    });

    $('#no-register').click(function (e){
        $('#guest_name').text('Are you not ' + $('#firstName').val() + ' ' + $('#lastName').val() + '?');
    })

    $('#confirm-register').click(function (e) {
        for (var key in registerForm) {
            if (registerForm.hasOwnProperty(key)) {
                var value = registerForm[key];

                localStorage.setItem(key, value);
            }
        }

        $("#show-details").modal('hide');

        window.location.href = "dashboard.html";
    })
```

2. Mobile (Flutter, Dart)

A. Question 1

```
generateWidget.createSimpleButton('Generate Number', () {
  arrDigit = [];
  numberContainingNine = '';
  containsNine = false;

  //let user to generate number with selected size of array (limit it)
  Random random = Random();
  for (int i = 0; i < sizeOfArray; i++) {
    int randomNumber = random.nextInt(100);
    arrDigit.add(randomNumber);
  }
```

```
String calcDigit(digitArr) {
  //check if contains '9' it will return that digit
  if (digitArr.contains('9')) {
    return digitArr;
  }

  //check if divisible by 2 it return that digit, otherwise it will return 'Odd'
  if (int.parse(digitArr) % 2 == 0) {
    return digitArr;
  } else {
    return 'Odd';
  }
}
```

```
    if (!containsNine) {
      //if does not contain '9' it will show the text below with the digits
      if (checkListForNine.contains('9')) {
        containsNine = true;
        numberContainingNine = checkListForNine;
      }

      return ListTile(
        title: Text('Number from Array: $digitArr'),
        subtitle: Text('Output: $checkListForNine'),
      ); // ListTile
    } else {
      //if contain '9' it will stop looping and show which digits will be excluded
      return ListTile(
        title: Text('Number $digitArr excluded due to $numberContainingNine'),
      ); // ListTile
    }
```

B. Question 2

```dart
/**
 * this function break into 5 steps
 * 1. check each and every character from the text that user key in
 * 2. if no special character or blank space found it will concantenate one each other
 * 3. if found, it will stop concantenate and get the word and insert into the array
 * 4. then, it will restart again (which is initialize the word to empty) (repeat step no.2)
 * 5. when all text checked, it will make a loop to check which of the word in th earray is longer
 **/
for (int i = 0; i < value.length; i++) {
  String char = value[i];

  //it will check the vowel
  if (char == 'a' || char == 'e' || char == 'i' || char == 'o' || char == 'u') {
    countEachVowel++;
    oneCharVowel[char] = (oneCharVowel[char] ?? 0) + 1;

    wordConstructed += char;
  }
  //it will check special character
  else if (char.contains(RegExp(r'[!@#$%^&*(),.?":{}|<>_-\s]'))) {
    countEachSpecialChar++;
    // ignore: unrelated_type_equality_checks
    if (char == RegExp(r'[\s]') || char == ' ') {
      char = '[ Blank Space ]';
    }

    oneCharSpecialChar[char] = (oneCharSpecialChar[char] ?? 0) + 1;

    listOfLongestWord.add(wordConstructed);
    wordConstructed = '';
  }
  //it will check numbers
  else if (char.contains(RegExp(r'[0-9]'))) {
    countEachNumber++;
    oneCharNumber[char] = (oneCharNumber[char] ?? 0) + 1;

    listOfLongestWord.add(wordConstructed);
    wordConstructed = '';
  }
  //it will check other than above which is consonant
  else {
    countEachConsonant++;
    oneCharConsonant[char] = (oneCharConsonant[char] ?? 0) + 1;

    wordConstructed += char;
  }
}
```

```dart
//the last word in the text will be added to the array
if (wordConstructed.isNotEmpty) {
  listOfLongestWord.add(wordConstructed);
}

//it will check which is longer than other from the array
for (var word in listOfLongestWord) {
  if (word.length > longestWordinList.length) {
    longestWordinList = word;
  }
}
```

C. Question 3

```dart
Widget generateRectangleSquare(int height, int length) {
  List<Widget> rows = [];

  //this will loop height from given (start at first line (in row))
  for (int i = 0; i < height; i++) {
    List<Widget> rowChildren = [];

    //then it will loop through until the end of length (in column)
    for (int j = 0; j < length; j++) {
      rowChildren.add(const Icon(Icons.star, color: Colors.redAccent));
    }
    rows.add(Row(
      mainAxisAlignment: MainAxisAlignment.center,
      children: rowChildren,
    ));
  }

  return Column(
    mainAxisAlignment: MainAxisAlignment.center,
    children: rows,
  );
}

Widget generateTriangle(int height) {      You, 20 hours ago • flutter
  List<Widget> rows = [];

  for (int i = 0; i < height; i++) {
    List<Widget> rowChildren = [];

    for (int j = 0; j <= i; j++) {
      rowChildren.add(const Icon(Icons.star, color: Colors.redAccent));
    }
    rows.add(Row(
      children: rowChildren,
    ));
  }

  return Column(
    // crossAxisAlignment: CrossAxisAlignment.start,
    crossAxisAlignment: CrossAxisAlignment.center,
    // crossAxisAlignment: CrossAxisAlignment.end,
    children: rows,
  );
}
```

```dart
Widget generateDiamond(int height) {
  List<Widget> rows = [];

  //the upper part is the same as triangle
  for (int i = 0; i < height; i++) {
    List<Widget> rowChildren = [];

    for (int j = 0; j < i; j++) {
      rowChildren.add(const Icon(Icons.star, color: Colors.redAccent));
    }
    rows.add(Row(
      mainAxisAlignment: MainAxisAlignment.center,
      children: rowChildren,
    ));
  }

  //but this is the inverse part, start from max (height) until 1
  for (int i = height; i > 0; i--) {
    List<Widget> rowChildren = [];

    for (int j = 0; j < i; j++) {
      rowChildren.add(const Icon(Icons.star, color: Colors.redAccent));
    }
    rows.add(Row(
      mainAxisAlignment: MainAxisAlignment.center,
      children: rowChildren,
    ));
  }

  return Column(
    mainAxisAlignment: MainAxisAlignment.center,
    children: rows,
  );
}
```

D. Question 4

```
void input(String input) {
  setState(() {
    //check input and change from symbol to math expression
    if (input == '÷') {
      expression = expression + input;
      expression = expression.replaceAll('÷', '/');
    } else if (input == 'x') {
      expression = expression + input;
      expression = expression.replaceAll('x', '*');
    } else if (input == 'AC') {
      expression = "";
      result = "0";
    } else if (input == 'Del') {
      if (expression == "") {
        expression = "";
      } else{
        expression = expression.substring(0, expression.length - 1);
      }
    } else if (input == '=') {
      try {
        //parse it into math expression using library
        Parser p = Parser();
        Expression exp = p.parse(expression);

        ContextModel cm = ContextModel();
        result = '${exp.evaluate(EvaluationType.REAL, cm)}';
      } catch (e) {
        result = "Error";
      }
    } else if(input == '.'){
      if(expression == ""){
        expression = '${expression}0.';
      }
    } else {
      expression = expression + input;
    }
  });
}
```

E. Question 5

```dart
Future<void> _loadHTMLFromAssets() async {
  await _webViewController?.loadFile(
    //get html file from assets to initially load it first (takes time)
    assetFilePath: "assets/question_5/question_5.html",
  );
}

@override
Widget build(BuildContext context) {
  return Scaffold(
    appBar: AppBar(
      title: const Text('Question 5'),
    ), // AppBar
    body: Padding(
      padding: const EdgeInsets.all(16),
      child: InAppWebView(
        initialUrlRequest: URLRequest(
          //because of using url from assets, so change it to blank url while waiting the assets to load
          url: Uri.parse("about:blank"),
        ), // URLRequest
        onWebViewCreated: (controller) {
          //when the launch url request, webview created
          ///(while take to load initial url, load html file from asset)      You, 1 second ago • Uncommitted
          _webViewController = controller;
          _loadHTMLFromAssets();
        },
      ), // InAppWebView
    ) // Padding
  ); // Scaffold
}
```