(ASSIGNMENT: 4)

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Batch	4

1. Write a program that takes a list of numbers as input and prints the even numbers in the list using a for loop.

Example:
Input: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Output: 2 4 6 8 10

Program

```dart
import 'dart:io';

void main() {
  var num = [];
  var choice = 0;
  //for list of numbers as input
  while (choice == 0) {
    print("Enter a number for List: ");
    var val = int.parse(stdin.readLineSync()!);
    num.add(val);
    print("Press any key except 0  for quit");
    choice = int.parse(stdin.readLineSync()!);
  }

  print("\nEven Number List");
  for (var i = 0; i < num.length; i++) {
    if(num[i]%2==0)
    {
      print(num[i]);
    }
  }
}
```

2. Write a program that prints the Fibonacci sequence up to a given number using a for loop.

Example:
Input: 10
Output: 0 1 1 2 3 5 8

```dart
import 'dart:io';

void main() {
  var num = 2;
  var new_val;
  var prev,after;
  var f = false;
  for (var i = 0; i <num;) {
    if (!f) {
      if (i == 0) {
        prev = i;
        print(prev);
        i++;
      } else if (i == 1) {
        after = i;
        print(after);
        f=true;
        new_val = prev + after;
        prev = after;
        after = new_val;
        i = after;
      }
    } else {
      print(new_val);
      new_val = prev + after;
      prev = after;
      after = new_val;
      i = after;
    }
  }
}
```

3. Implement a code that checks whether a given number is prime or not.

Example:

Input: 17

Output: 17 is a prime number.

```dart
import 'dart:io';

void main() {
  print("Enter a Number: ");
  var num = int.parse(stdin.readLineSync()!);
  var i = num - 1;
  var prime_number=false;
  if (num > 2) {
    while (i > 1)
    {
      if (num % i == 0)
      {
        prime_number = false;
      }
      else
      {
        prime_number = true;
      }
      i--;
    }
  }
  else if(num==2)
  {
    prime_number=true;
  }
  if (prime_number) {
    print("$num is prime number");
  } else {
    print("$num is not prime number");
  }
}
```

4. Implement a code that finds the factorial of a number using a while loop or for loop.

Example:
Input: 5
Output: Factorial of 5 is 120

```dart
import 'dart:io';

void main() {
  print("Enter a Number: ");
  var num = int.parse(stdin.readLineSync()!);
  var val;
  for(var i=0;i<=num;i++)
  {
    if(i==0 || i==1)
    {
        val=1;
    }
    else
    {
        val=val*i;
    }
  }
  print("Factorial of $num is $val");
}
```

5. Write a program that calculates the sum of all the digits in a given number using a while loop.

Example:
Input: 12345
Output: Sum of digits: 15

```dart
import 'dart:io';

void main() {
  print("Enter a Number: ");
  int num = int.parse(stdin.readLineSync()!);
  int val=0;
  int rem;
  int div;
  while(num>=1)
  {
    rem=num%10;
    div=(num/10).toInt();
    num=div;
    val+=rem;
  }
  print(val);
  }
```

6. Implement a code that finds the largest element in a list using a for loop.

Example:
Input: [3, 9, 1, 6, 4, 2, 8, 5, 7]
Output: Largest element: 9

```dart
import 'dart:io';

void main() {
  var num=[2,5,6,14,4,8,1];
  var max=0;
  for(var i=0;i<num.length;i++)
  {
    if(num[i]>max)
    {
        max=num[i];
    }
  }
  print("largest element is $max");
}
```

7. Write a program that prints the multiplication table of a given number using a for loop.

Example: Input:
5
Output:
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
...
5 x 10 = 50

```dart
import 'dart:io';

void main() {
  var num=5;
  for(var i=1;i<=10;i++)
  {
    print("$num x $i = ${num*i}");
  }
}
```

9. Implement a function that checks if a given string is a palindrome.

Example:
Input: "radar"
Output: "radar" is a palindrome.

```dart
import 'dart:io';

void main() {
  var val = "radar";
  var new_val = [];
  var j = 0;
  var palindrome = true;
  for (var i = val.length - 1; i >= 0; i--) {
    new_val.add(val[i]);
  }
  for (int i = 0; i < val.length; i++) {
    if (new_val[i] != val[i]) {
      palindrome = false;
    }
  }
  if(palindrome)
  {
    print("$val is palindrome");
  }
  else
  {
    print("$val is not palindrome");
  }
}
```

10. Write a program to display the cube of the number up to an integer.

Test Data :

Input number of terms : 5 *Expected*

Output :

Number is : 1 and cube of the 1 is :1

Number is : 2 and cube of the 2 is :8

Number is : 3 and cube of the 3 is :27

Number is : 4 and cube of the 4 is :64

Number is : 5 and cube of the 5 is :125

```
import 'dart:io';

void main() {
    var num=5;
    for(var i=1;i<=num;i++)
    {
        print("Number is :$i and cube of the $i is :${i*i*i}");
    }
}
```

11. Write a program to display a pattern like a right angle triangle using an asterisk using loop. The pattern like :

```
*
**
***
****
```

```
import 'dart:io';

void main() {
    for(int i=1;i<5;i++)
    {
        for(int j=0;j<i;j++)
        {
            stdout.write("*");
        }
        print('');
    }
}
```

12. Write a program to display a pattern like a right angle triangle with a number using loop. The pattern like :

1
12
123
1234

```dart
import 'dart:io';

void main() {
    for(int i=1;i<5;i++)
    {
        for(int j=1;j<=i;j++)
        {
            stdout.write(j);
        }
        print('');
    }
}
```

13. Write a program to make such a pattern like a right angle triangle with a number which will repeat a number in a row. The pattern like :

1
22
333
4444

```dart
import 'dart:io';

void main() {
    for(int i=1;i<5;i++)
    {
        for(int j=1;j<=i;j++)
        {
            stdout.write(i);
        }
        print('');
    }
}
```

14. Write a program to make such a pattern like a right angle triangle with the number increased by 1 using loop.. The pattern like :

1
2 3
4 5 6
7 8 9 10

```dart
import 'dart:io';

void main() {
    var k=1;
    for(int i=1;i<5;i++)
    {
        for(int j=1;j<=i;j++)
        {
            stdout.write(k);
            k++;
        }
        print('');
    }
}
```

15. Write a program to make a pyramid pattern with numbers increased by 1.

1
2 3
4 5 6
7 8 9 10

```dart
import 'dart:io';

void main() {
    var l=1;
    for(int i=0;i<4;i++)
    {
        for(var j=4-i;j>1;j--)
        {
            stdout.write(" ");
        }
        for(int k=0;k<=i;k++)
        {
            stdout.write("$l ");
            l++;
        }
        print('');
    }
}
```

16. Write a program to make such a pattern as a pyramid with an asterisk.

```
   *
  * *
 * * *
* * * *
```

```dart
import 'dart:io';

void main() {
    for(int i=0;i<4;i++)
    {
        for(var j=4-i;j>1;j--)
        {
            stdout.write(" ");
        }
        for(int k=0;k<=i;k++)
        {
            stdout.write("* ");
        }
        print('');
    }
}
```

17. Write a program that asks the user for their email and password. If the email and password match a predefined set of credentials, print "User login successful." Otherwise, keep asking for the email and password until the correct credentials are provided.

```dart
import 'dart:io';
void main() {
  var login=false;
  var actual_email="shehroz279@gmail.com";
  var actual_password="shehroz279";
  var email,password;
  while(!login)
  {
    stdout.write("Enter your Email: ");
    email=stdin.readLineSync();
    stdout.write("Enter your Password: ");
    password=stdin.readLineSync();
    if(email==actual_email && password==actual_password)
    {
      login=true;
    }
    else{
      print("*Invalid Credietial*");
    }
  }
  print("User Login Successfull");
}
```

18. Write a program that asks the user for their email and password. You are given a list of predefined user credentials (email and password combinations). If the entered email and password match any of the credentials in the list, print "User login successful." Otherwise, keep asking for the email and password until the correct credentials are provided.

```
import 'dart:io';
void main() {
  var login=false;
  var valid_credentials=["shehroz279@gmail.com","shehroz279"];
  var email,password;
  while(!login)
  {
    stdout.write("Enter your Email: ");
    email=stdin.readLineSync();
    stdout.write("Enter your Password: ");
    password=stdin.readLineSync();
    if(email==valid_credentials[0] && password==valid_credentials[1])
    {
      login=true;
    }
    else{
      print("*Invalid Credietial*");
    }

  }
  print("User Login Successfull");
}
```

19. Write a program that takes a list of numbers as input and prints the numbers greater than 5 using a for loop and if-else condition.

```
import 'dart:io';

void main() {
  var num = [];
  var choice = 0;
  //for list of numbers as input
  while (choice == 0) {
    print("Enter a number for List: ");
    var val = int.parse(stdin.readLineSync()!);
    num.add(val);
    print("Press any key except 0  for quit");
    choice = int.parse(stdin.readLineSync()!);
  }
  print("\nGreater than 5 numbers List");
  for (var i = 0; i < num.length; i++) {
    if(num[i]>5)
    {
      print(num[i]);
    }
  }
}
```

20. Write a program that counts the number of vowels in a given string using a for loop and if-else condition.

```
import 'dart:io';

void main() {
  var value;
  var vowels=['a','e','i','o','u','A','E','I','O','U'];
  var count=0;
  stdout.write("Enter a String: ");
  value=stdin.readLineSync();
  for(var i=0;i<vowels.length;i++)
  {
      for(var j=0;j<value.length;j++)
      {
        if(vowels[i]==value[j])
        {
          count++;
        }
      }
  }
  print("Number of Vowels = $count");
}
```

21. Implement a code that finds the maximum and minimum elements in a list using a for loop and if-else condition.

```
import 'dart:io';

void main() {
  var num=[2,5,6,14,4,8,1];
  var max=num[0];
  var min=num[0];
  for(var i=0;i<num.length;i++)
  {
    if(num[i]>=max)
    {
        max=num[i];
    }
    if(num[i]<=min)
    {
        min=num[i];
    }
  }
  print("Maximum element is $max");
  print("Minimum element is $min");
}
```

22. Write a program that calculates the sum of the squares of all odd numbers in a given list using a for loop and if-else condition.

```dart
import 'dart:io';

void main() {
  var num=[2,5,6,14,3,8,1];
  var sum=0;
  for(var i=0;i<num.length;i++)
  {
    if(num[i]%2!=0)
    {
      sum+=num[i]*num[i];
    }
  }
  print("sum of the squares of all odd numbers = $sum");
}
```

23. Write a program that takes a list of student details as input, where each student is represented by a map containing their name, marks, section, and roll number. The program should determine the grade of each student based on their average score (assuming maximum marks for each subject is 100) and print the student's name along with their grade.

List<Map<String, dynamic>> studentDetails = [
 {'name': 'John', 'marks': [80, 75, 90], 'section': 'A', 'rollNumber': 101},
 {'name': 'Emma', 'marks': [95, 92, 88], 'section': 'B', 'rollNumber': 102}, {'name': 'Ryan', 'marks': [70, 65, 75], 'section': 'A', 'rollNumber': 103},

```
]; import 'dart:io';

void main() {

  List<Map<String, dynamic>> studentDetails = [];
  List<Map<String, dynamic>> studentGrade = [];

  dynamic name,section,rollNumber,val;
  List marks=[];
  var choice;
  stdout.write("How many Students detail You wanted to enter: ");
  choice=int.parse(stdin.readLineSync()!);
  for(var i=0;i<choice;i++)
  {
    stdout.write("Enter Name: ");
    name=stdin.readLineSync();
    marks.clear();
    for(var j=0;j<3;j++)
    {
      stdout.write("Enter Subject ${j+1} marks: ");
      val=int.parse(stdin.readLineSync()!);
      marks.add(val);
    }
    stdout.write("Enter Section: ");
    section=stdin.readLineSync();
    stdout.write("Enter Roll Number: ");
    rollNumber=int.parse(stdin.readLineSync()!);
    dynamic m=marks;
    studentDetails.add({'name':name, 'marks': marks, 'section': '$section',
'rollNumber': '$rollNumber'});

  }
  dynamic obtained_marks;
  dynamic grade;
  for(var k=0;k<studentDetails.length;k++)
  {
    obtained_marks=0;
    for(var l=0;l<studentDetails[k]['marks'].length;l++)
    {
      obtained_marks+=studentDetails[k]['marks'][l];
```

```
    }
    print(obtained_marks);
    var total_marks=300;
    var percentage=(obtained_marks/total_marks)*100;
    if(percentage<33)
    {
      grade="F";
    }
    else if(percentage>=33 && percentage<40)
    {
      grade="E";
    }
    else if(percentage>=40 && percentage<50)
    {
      grade="D";
    }
    else if(percentage>=50 && percentage<60)
    {
      grade="C";
    }
    else if(percentage>=60 && percentage<70)
    {
      grade="B";
    }
    else if(percentage>=70 && percentage<80)
    {
      grade="A";
    }
    else
    {
      grade="A+";
    }
    var stdname=studentDetails[k]['name'];
    var stdgrade=grade;
    studentGrade.add({'name':'$stdname','grade':stdgrade});
  }
  for(var m=0;m<studentGrade.length;m++)
  {
    print("\nStudent Name: ${studentGrade[m]['name']}");
    print("Grade: ${studentGrade[m]['grade']}");
  }
}
```

24. Implement a code that finds the average of all the negative numbers in a list using a for loop and if-else condition.

```dart
import 'dart:io';

void main() {
  var numbers=[2,7,-8,-6,4];
  var count=0;
  var sum_negative=0;
  var average_negate;
  for(var i=0;i<numbers.length;i++)
  {
    if(numbers[i]<0)
    {
      sum_negative+=numbers[i];
      count++;
    }
  }
  average_negate=sum_negative/count;
  print("Average of all negative numbers is: $average_negate");
}

```

44. Write a program that takes a list of integers as input and returns a new list containing only the prime numbers from the original list. Implement the solution using a for loop and logical operations.

Input: [4, 7, 10, 13, 16, 19, 22, 25, 28, 31]
Output: [7, 13, 19, 31]

```dart
import 'dart:io';

void main() {
  List numbers = [4, 7, 10, 13, 16, 19, 22, 25, 28, 31];
  List prime = [];
  for (var j = 0; j < numbers.length; j++) {
    var prime_number = false;
    if (numbers[j] == 1) {
      prime_number = false;
    } else if (numbers[j] == 2) {
      prime_number = true;
    } else {
      for (var i = 2; i < numbers[j]; i++) {
        if (numbers[j] % i != 0) {
          prime_number = true;
          break;
        }
      }
      if (prime_number) {
        prime.add(numbers[j]);
      }
    }
  }
  print(prime);
}
```