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**IT 3A**

```
class Q {  
// Q1 Write a program called Fibonacci to display the first 20 Fibonacci numbers  
public double fibonacci(int number) {  
    int n1 = 0, n2 = 1, n3, i;  
    int sum = 1;  
    System.out.print(n2);  
  
    for (i = 2; i < number + 1; ++i) // loop starts from 2 because 1 and 1 are already printed  
    {  
        n3 = n1 + n2;  
        System.out.print(" " + n3);  
        sum += n3;  
        n1 = n2;  
        n2 = n3;  
    }  
    return (sum / number);  
}
```

**// Q2 Write a Java program called SumDigits to sum up the individual digits of a positive integer, given in // the command line.**

```
public void sumOfDigits(int input) {  
    int d = 1, sum = 0;  
    int n = input;  
  
    System.out.print("The sum of digits = ");  
    while (n > 1) {  
        d = n % 10;  
        sum += d;  
        System.out.print(d + " ");  
        n = n / 10;  
    }  
    System.out.print(" = " + sum + "\n");  
}
```

**// Q3 Write a program called HarmonicSum to compute the sum of a harmonic series**

```
public void harmonicSum(int input) {  
    int maxDenominator = input;  
    double sumL2R = 0.0; // sum from left-to-right  
    double sumR2L = 0.0; // sum from right-to-left  
  
    for (int denominator = 1; denominator <= maxDenominator; denominator++) {  
        sumL2R += (double) (1.0 / denominator); // Because int/int will give 0 so we cast it to double  
    }  
    for (int denominator = maxDenominator; denominator >= 1; denominator--) {  
        sumR2L += (double) (1.0 / denominator); // Because int/int will give 0 so we cast it to double  
    }  
}
```

```

    }
    System.out.println("Sum left to right: " + sumL2R);
    System.out.println("Sum right to left: " + sumR2L);
    System.out.println("Difference: " + (sumL2R - sumR2L));
}

```

// Q4 Write a program to print the Nth prime number.

```

public void printPrime(int input) {
    int num = 2; // after 2
    for (int i = 2; i <= input; i++) { // we want input number of outputs
        int status = 1;
        num++;
        for (int j = 2; j <= Math.sqrt(num); j++) {
            if (num % j == 0) {
                status = 0;
                break;
            }
        }
        if (status != 0) {
            i++; // ith prime number
        }
    }
    System.out.println(input + "th prime number is " + num);
}
}

```

```

public class test {
    public static void main(String[] args) {
        int input = Integer.parseInt(args[0]);

        // Q1
        Q q1 = new Q();
        double ans = q1.fibonacci(input);
        System.out.println("\nAverage is: " + ans);
    }
}

```

```

mavn:Java/ $ javac test.java
mavn:Java/ $ java test 20
1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765
Average is: 885.0
mavn:Java/ $ 

```

// Q2

Q q2 = new Q();

q2.sumOfDigits(input);

```
mavn:Java/ $ javac test.java
mavn:Java/ $ java test 987655
The sum of digits = 5 5 6 7 8 9 = 40
mavn:Java/ $
```

// Q3

Q q3 = new Q();

q3.harmonicSum(input);

```
mavn:Java/ $ javac test.java
mavn:Java/ $ java test 20
Sum left to right: 3.597739657143682
Sum right to left: 3.597739657143682
Difference: 0.0
mavn:Java/ $
```

// Q4

Q q4 = new Q();

q4.printPrime(input);

```
mavn:Java/ $ javac test.java
mavn:Java/ $ java test 20
20th prime number is 71
mavn:Java/ $
```

```
}
}
```