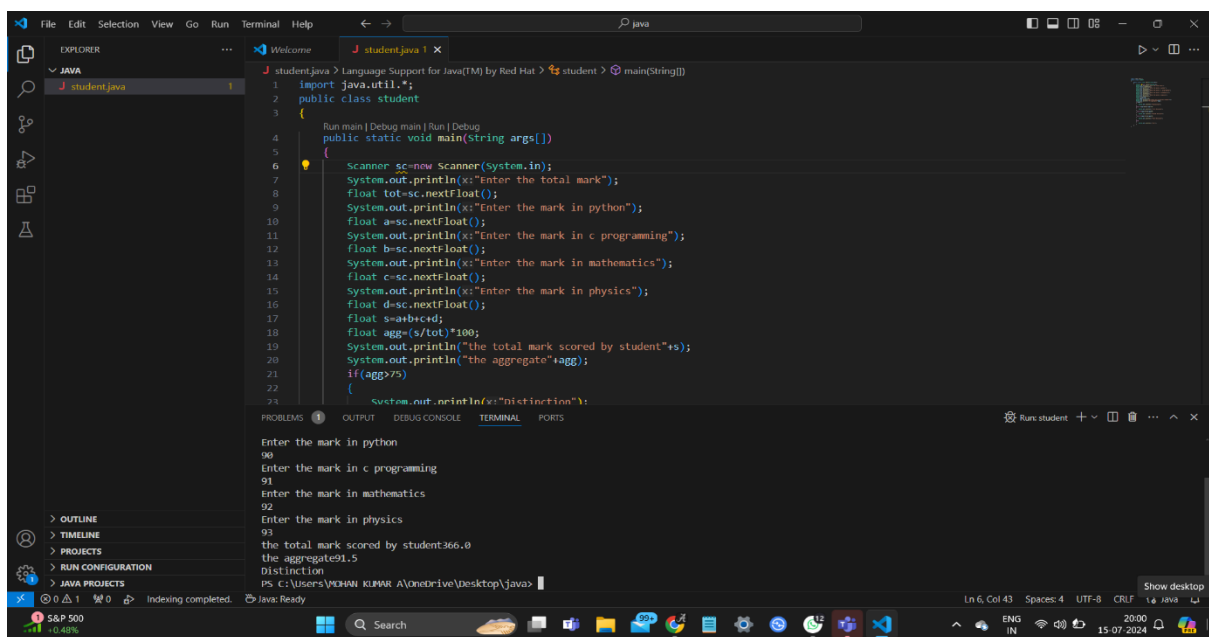


## ASSIGNMENT 2

- 1) Write a program to enter the marks of a student in four subjects. Then calculate the total and aggregate, display the grade obtained by the student. If the student scores an aggregate greater than 75%, then the grade is Distinction. If aggregate is  $60 \geq$  and  $< 75$ , then the grade is First Division. If aggregate is  $50 \geq$  and  $< 60$ , then the grade is Second Division. If aggregate is  $40 \geq$  and  $< 50$ , then the grade is Third Division. Else the grade is Fail.



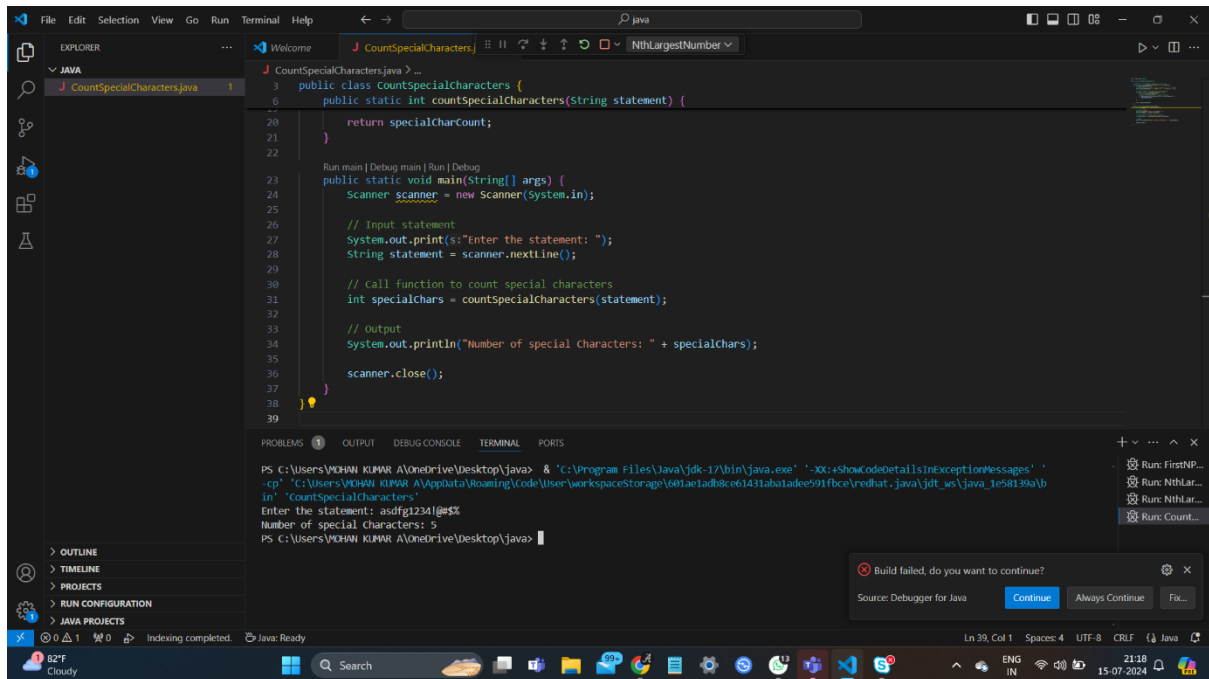
The screenshot shows an IDE with a Java file named 'student.java'. The code prompts the user to enter marks for four subjects: python, c programming, mathematics, and physics. It calculates the total mark and the aggregate percentage. Based on the aggregate percentage, it determines the grade: Distinction (if > 75), First Division (if between 60 and 75), Second Division (if between 50 and 60), Third Division (if between 40 and 50), or Fail (otherwise). The terminal output shows the program execution with sample inputs and the resulting total mark, aggregate percentage, and grade.

```
1 import java.util.*;
2 public class student
3 {
4     public static void main(String args[])
5     {
6         Scanner sc=new Scanner(System.in);
7         System.out.println("Enter the total mark");
8         float tot=sc.nextFloat();
9         System.out.println("Enter the mark in python");
10        float a=sc.nextFloat();
11        System.out.println("Enter the mark in c programming");
12        float b=sc.nextFloat();
13        System.out.println("Enter the mark in mathematics");
14        float c=sc.nextFloat();
15        System.out.println("Enter the mark in physics");
16        float d=sc.nextFloat();
17        float s=a+b+c+d;
18        float agg=(s/tot)*100;
19        System.out.println("the total mark scored by student"+s);
20        System.out.println("the aggregate"+agg);
21        if(agg>75)
22        {
23            System.out.println("Distinction");
24        }
25    }
26 }
```

Run main | Debug main | Run | Debug

Enter the mark in python  
90  
Enter the mark in c programming  
91  
Enter the mark in mathematics  
92  
Enter the mark in physics  
93  
the total mark scored by student:366.0  
the aggregate:91.5  
Distinction  
PS C:\Users\VEENI KUMAR A\OneDrive\Desktop\java>

- 2) Write a program to find the number of special characters in the given statement



3)Write a Program to Find the Nth Largest Number in a array.

```
1 import java.util.Scanner;
2
3 public class NthLargestNumber {
4
5     // Function to find the Nth largest number in an array
6     public static int findNthLargest(int[] arr, int N) {
7         // Edge case: if N is out of bounds
8         if (N <= 0 || N > arr.length) {
9             throw new IllegalArgumentException(s:"Invalid value of N");
10        }
11
12        // We will find (N-1)th largest element iteratively
13        for (int i = 0; i < N; i++) {
14            int maxIndex = i;
15            // Find the index of the maximum element in the unsorted portion
16            for (int j = i + 1; j < arr.length; j++) {
17                if (arr[j] > arr[maxIndex]) {
18                    maxIndex = j;
19                }
20            }
21            // Swap the maximum element with the current position
22            int temp = arr[i];
23            arr[i] = arr[maxIndex];
24            arr[maxIndex] = temp;
25        }
26    }
27
28    public static void main(String[] args) {
29        Scanner sc = new Scanner(System.in);
30        System.out.println("Enter the number of elements in the list: ");
31        int n = sc.nextInt();
32        System.out.println("Enter the elements of the list: ");
33        int[] arr = new int[n];
34        for (int i = 0; i < n; i++) {
35            arr[i] = sc.nextInt();
36        }
37        System.out.println("Enter the value of N (to find the Nth largest number): ");
38        int N = sc.nextInt();
39        int result = findNthLargest(arr, N);
40        System.out.println("The " + N + "th Largest number is: " + result);
41    }
42}
```

PS C:\Users\VIJAY KUMAR A\OneDrive\Desktop\java> .\NthLargestNumber.exe -xx:showCodeDetailsInExceptionMessages -cp "C:\Users\VIJAY KUMAR A\AppData\Roaming\Code\User\workspaceStorage\601ae1ad8ce61431aba1adee591fbee\redhat.java\jdk\_ws\java\_1e58139a\b\in" "NthLargestNumber"

Enter the number of elements in the list: 5  
Enter the elements of the list: 12 34 76 45 98  
Enter the value of N (to find the Nth largest number): 3  
The 3th Largest number is: 45

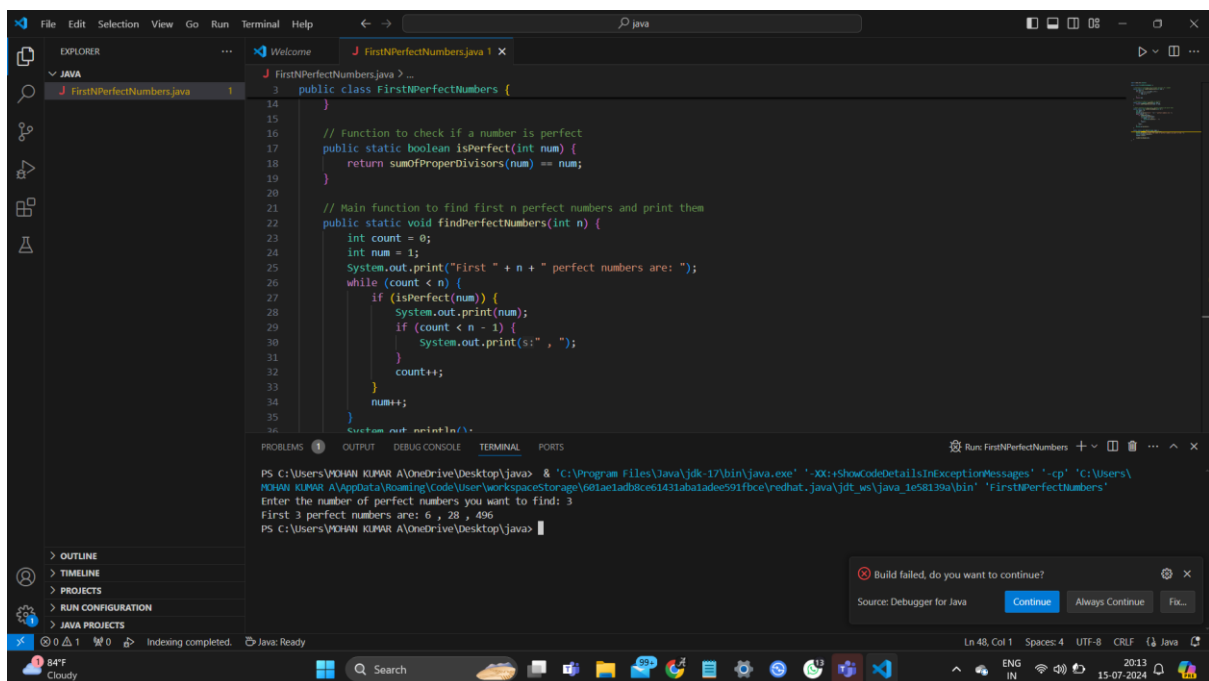
4) Write a program to calculate tax given the following conditions:

```
1 import java.util.Scanner;
2
3 public class CalculateTax {
4
5     public static double calculateTax(double income) {
6         double tax = 0.0;
7
8         if (income <= 150000) {
9             tax = 0;
10        } else if (income <= 300000) {
11            tax = (income - 150000) * 0.1;
12        } else if (income <= 500000) {
13            tax = 150000 * 0.1 + (income - 300000) * 0.2;
14        } else {
15            tax = 150000 * 0.1 + 200000 * 0.2 + (income - 500000) * 0.3;
16        }
17
18        return tax;
19    }
20
21    public static void main(String[] args) {
22        Scanner sc = new Scanner(System.in);
23        System.out.println("Enter the income: ");
24        double income = sc.nextDouble();
25        double tax = calculateTax(income);
26        System.out.println("Tax = " + tax);
27    }
28}
```

PS C:\Users\VIJAY KUMAR A\OneDrive\Desktop\java> .\CalculateTax.exe -xx:showCodeDetailsInExceptionMessages -cp "C:\Users\VIJAY KUMAR A\AppData\Roaming\Code\User\workspaceStorage\601ae1ad8ce61431aba1adee591fbee\redhat.java\jdk\_ws\java\_1e58139a\b\in" "CalculateTax"

Enter the income: 200000  
Tax = 50000.0

5) Write a program to print the first n perfect numbers. (Hint Perfect number means a positive integer that is equal to the sum of its proper divisors)



```
14 }
15
16 // Function to check if a number is perfect
17 public static boolean isPerfect(int num) {
18     return sumOfProperDivisors(num) == num;
19 }
20
21 // Main function to find first n perfect numbers and print them
22 public static void findPerfectNumbers(int n) {
23     int count = 0;
24     int num = 1;
25     System.out.print("First " + n + " perfect numbers are: ");
26     while (count < n) {
27         if (isPerfect(num)) {
28             System.out.print(num);
29             if (count < n - 1) {
30                 System.out.print(", ");
31             }
32             count++;
33         }
34         num++;
35     }
36     System.out.println();
37 }
```

PS C:\Users\MOHAN KUMAR A\OneDrive\Desktop\java> & 'C:\Program Files\Java\jdk-17\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\MOHAN KUMAR A\AppData\Roaming\Code\User\workspaceStorage\601ae1adb8ce61431abafadee991fbce\redhat.java\jdt\_ws\java\_1e58139a\bin' 'FirstNPerfectNumbers'

Enter the number of perfect numbers you want to find: 3

First 3 perfect numbers are: 6 , 28 , 496

PS C:\Users\MOHAN KUMAR A\OneDrive\Desktop\java>

Build failed, do you want to continue?  
Source: Debugger for Java [Continue] [Always Continue] [Fix...]