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ROLL NO. 26

EN NO. 22FOTCA11034
SUB - C++

1.	MODE FROM STATISTICS IN 10TH CLASS

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	#include<iostream>
	using namespace std;
	
	// Function to calculate and print the mode value Z
	void mode()
	{
	int k=0, h = 0, r = 0, arr1[100], arr2[100], arr3[100], limit;
	int f1=0, f2=0, f0=0, l=0;
	double dif=0, z=0;
	
	// Input: Get the number of values to be entered
	cout << "Enter how many values you want to enter:";
	cin >> limit;
	
	cout << "\n\n Example of x = 35-45\n Means 35 is the left side of x and 45 is the right side of x:\n";
	
	// Collect left side of x-values
	while (h < limit)
	{
	r = h + 1;
	cout << "\n Enter the left side of x " << r << " value:";
	cin >> arr1[h];
	h++;
	}
	
	h = 0;
	
	cout<<"\n";
	
	// Collect right side of x-values
	while (h < limit)
	{
	r = h + 1;
	cout << "\n Enter the right side of x " << r << " value:";
	cin >> arr2[h];
	h++;
	}
	
	h = 0;
	
	cout<<"\n";
	
	// Collect y-values
	while (h < limit)

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    {
        r = h + 1;
        cout << "\n Enter the value of y " << r << ":";
        cin >> arr3[h];
        h++;
    }

    h = 0;

    cout<<"\n";

    // Display header for the x and y table
    cout << "\n HARDIK DHARAIYA        22FOTCA11034 \n\n x \t\t y \n";
    cout << "-------------------------\n";

    // Print x-values and y-values in two columns
    while (h < limit)
    {
        cout << " " << arr1[h] << "-" << arr2[h] << "\t\t " << arr3[h] << "\n";
        h++;
    }

    // Find the index and value of the maximum y
    int max_y = arr3[0];
    int max_y_index = 0;
    for (k = 1; k < limit; k++)
    {
        if (arr3[k] > max_y)
        {
            max_y = arr3[k];
            max_y_index = k;
        }
    }

    // Print the maximum y value and its corresponding x range
    cout << "\n Maximum value of y: " << max_y << endl;
    cout << " X range corresponding to max y: " << arr1[max_y_index] << "-" <<
arr2[max_y_index] << endl;

    // Calculate and print f0, f1, and f2 values
    f0 = arr3[max_y_index - 1];
    cout << " f0 = " << f0 << endl;

    f1 = arr3[max_y_index];
    cout << " f1 = " << f1 << endl;

    f2 = arr3[max_y_index + 1];
    cout << " f2 = " << f2 << endl;
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    // Calculate values for the model
    dif = arr2[0] - arr1[0];
    l = arr1[max_y_index];
    cout << " h = " << dif << endl;
    cout << " l = " << l << endl;

    int solf1 = f1 * 2;
    int upsideZ = f1 - f0;
    int downsideZ = solf1 - f0 - f2;
    float solup = (upsideZ * dif) / downsideZ;

    z = l + solup;

    // Print the calculated mode value Z
    cout << "\n\n Mode(Z) = " << z << endl;
}

// Main function where the program starts
int main()
{
    mode(); // Call the mode function
    return 0; // Return 0 to indicate successful program execution
}
```

OUTPUT

```
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x       y
--------------------------
5-15        6
15-25       11
25-35       21
35-45       23
45-55       14
55-65       6

Maximum value of y: 23
X range corresponding to max y: 35-45
f0 = 21
f1 = 23
f2 = 14
h = 10
l = 35


Mode(Z) = 36.8182
```