# CAP281: OBJECT ORIENTED PROGRAMMING LABORATORY

## Section: D2104

## Set: B (Even)

## Question:

| Sr. No | Question | Max Marks | Page |
|---|---|---|---|
| 1 | Create Program to calculate MEAN, MODE, MEDIAN using different operators? | 10 | 1-3 |
| 2 | Create an array having STRING “Humanity First “. use it to represent concept of array derived datatype with the help of all arithmetic operators? | 10 | 4-5 |
| 3 | Rewrite the same code using ternary operator? String grade; if(marks >= 90) { grade = “A”; } else if( marks >= 80 ) { grade = “B”; } else { grade = “C”;} | 10 | 6 |

Source Code Link


Summited to:

Priyanka Ma’am

Submitted by:

Pramatma Vishwakarma
Roll: No. A32
Reg. No 12103282

**Question 1: Create Program to calculate MEAN, MODE, MEDIAN using different operators?**

**Answer:**

```
/*////////////////////////////////
||  Name : Pramatma Vishwakarma   ||
||  Class : M.Sc IT               ||
||  Roll No. : A32                ||
||  Set: B (Even Roll No)         ||
||  Reg. No. : 12103282           ||
////////////////////////////////*/

#include <algorithm>
#include <iostream>
#include<math.h>
using namespace std;
                        /*
                Algorithm for mean:
declare a variable sum and initialize it with 0.
start loop form i = 0 to n. For each arr[i], add arr[i] in the sum.
print means of data as sum/n
                        */
float mean(float arr[], int n){  /* function to calculate mean*/
    float sum = 0;
    for(int i = 0; i < n; i++){
        sum += arr[i];
    }
    return sum/n;
}
                        /*
            Algorithm for median:

    sort the array.
    if the length of array i.e. n is odd then print arr[i]/2.
    if the length of array i.e. n is even, then print  (arr[n/2 - 1] + arr[n/2])/2
                        */
float median(float arr[], int n){ /* function to calculate median*/

    sort(arr, arr + n); // sorting array

    if (n % 2 == 0)
        return (arr[n/2 - 1] + arr[n/2]) /2;
    return arr[n/2];
}
                            /*
```

```
                Algorithm for mode:
        1.sort the array
        2.declare three variables, let consider max_count, res, and count.
        3.initialize max_count with 1, res with the first element of the array and count with
1.
        4.start a loop form i = 0 to n. for each arr[i], if arr[i] is equal to arr[i – 1] then
increment count by 1, otherwise, if count is greater than max_count then max_count = count and
save arr[i – 1] in res. save 1 in count and close else.
        5.close the loop
        6.print res.
                            */
// finding mode of ungrouped data
float mode(float arr[], int n){ /* function to findiing mode of ungrouped data*/

    sort(arr, arr + n); // sorting the array

    // finding max frequency
    int max_count = 1;
    int result = arr[0];
    int count = 1;
    for(int i = 1; i < n; i++){
        if(arr[i] == arr[i - 1])
            count++;
        else{
            if (count > max_count){
                max_count = count;
                result = arr[i - 1];
            }
            count = 1;
        }
    }
    // when the last element is most frequent
    if (count > max_count)
    {
        max_count = count;
        result = arr[n - 1];
    }
    return result;
}
int main(){
    int n;
    float arr[50];
    cout << "Enter the size of the array: ";
```

```
    cin >> n;
    cout << "Enter the element of the array: ";
    for (int i = 0; i < n; i++){
        cin >> arr[i];
    }
        cout << "**************************" << endl;
        cout << "\tMean = " << mean(arr, n) << endl;
        cout << "\tMedian = " << median(arr, n)<< endl;
        cout << "\tMode = " << mode(arr, n)<< endl;
        cout << "**************************" << endl;
}
// Time Complexity = O(n), where n is the number of data
```

**Output:**

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

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Try the new cross-platform PowerShell https://aka.ms/pscore6

PS F:\M.Sc Information Technology\1st Year\2nd Semester\CAP281 OBJECT ORIENTED PROGRAMMING-LABORATORY\CA\CA1 CAP281 OBJECT
mation Technology\1st Year\2nd Semester\CAP281 OBJECT ORIENTED PROGRAMMING-LABORATORY\CA\CA1 CAP281 OBJECT ORIENTED PROGRA
an.cpp -o 1_Mean_Mode_Median } ; if ($?) { .\1_Mean_Mode_Median }
Enter the size of the array: 5
Enter the element of the array: 43 23 65 69 56
**************************
        Mean = 51.2
        Median = 56
        Mode = 23
**************************
PS F:\M.Sc Information Technology\1st Year\2nd Semester\CAP281 OBJECT ORIENTED PROGRAMMING-LABORATORY\CA\CA1 CAP281 OBJECT
```

**Question 1: Create an array having STRING “Humanity First “. Use it to represent concept of array derived datatype with the help of all arithmetic operators?**

```
/*////////////////////////////////
||  Name : Pramatma Vishwakarma   ||
||  Class : M.Sc IT               ||
||  Roll No. : A32                ||
||  Set: B (Even Roll No)         ||
||  Reg. No. : 12103282           ||
////////////////////////////////*/

#include <iostream>
#include<math.h>
using namespace std;

void string_value (){
    char ch, str[200];
    int I = 0, val;

    cout<<”Enter the String: “;
    gets(str);
    cout << “\nCharacter   |  ASCII Value\n”;
    while (str[i]){
        ch = str[i];
        val = ch;
        cout << ch << “\t    |     “ << val <<endl;
        i++;
    }
}
int main () {
    string_value ();
    char str1[] = “c”;
    cout << char (str1[1]) << endl;

    char str[] = {“Humanity First”};
    cout << “******* String Addition ********” << endl;
    cout << “\t “<< char(str[0]) << “ + “ << char(str[1]) << “: “;
    cout << (char) str[0] + str[1] << endl << endl;
    cout << “******* String Subtraction ********” << endl;
    cout << “\t “<< char(str[4]) << “ + “ << char(str[5]) << “: “;
    cout << (char) str[4] – str[5] << endl << endl;

    cout << “******* String Multiplication ********” << endl;
    cout << “\t “<< char(str[3]) << “ * “ << char(str[6]) << “: “;
```

```
    cout << (char) str[3] * str[6] << endl << endl;
    cout << "******* String Division ********" << endl;
    cout << "\t "<< char(str[7]) << " * " << char(str[9]) << ": ";
    cout << (char) str[7] / str[9] << endl << endl;
    cout << "******* String Modulus ********" << endl;
    cout << "\t "<< char(str[4]) << " % " << char(str[3]) << ": ";
    cout << (char) str[4] % str[3] << endl << endl;
}
```

**Output:**

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

PS F:\M.Sc Information Technology\1st Year\2nd Semester\CAP281 OBJECT ORIE
mation Technology\1st Year\2nd Semester\CAP281 OBJECT ORIENTED PROGRAMMING
.cpp -o 2_Humanity_First } ; if ($?) { .\2_Humanity_First }
Enter the String: Humanity First

Character   |  ASCII Value
H           |     72
u           |     117
m           |     109
a           |     97
n           |     110
i           |     105
t           |     116
y           |     121
            |     32
F           |     70
i           |     105
r           |     114
s           |     115
t           |     116

******* String Addition ********
         H + u: 189

******* String Subtraction ********
         n + i: 5

******* String Multiplication ********
         a * t: 11252

******* String Division ********
         y * F: 1

******* String Modulus ********
         n % a: 13

PS F:\M.Sc Information Technology\1st Year\2nd Semester\CAP281 OBJECT ORIE
```

**Question 3: Rewrite the same code using ternary operator?**

**String grade; if(marks >= 90) { grade = “A”; } else if( marks >= 80 ) { grade = “B”; } else { grade = “C”;}**

**Answer**

```
/*////////////////////////////////////
||  Name : Pramatma Vishwakarma    ||
||  Class : M.Sc IT                ||
||  Roll No. : A32                 ||
||  Set: B (Even Roll No)          ||
||  Reg. No. : 12103282            ||
////////////////////////////////////*/

#include <iostream>
using namespace std;

int main() {
    cout << "Enter marks: ";
    int marks;
    cin >> marks;
    string grade;

    grade = (marks >= 90) ? "\tA":
            (marks >= 80) ? "\tB": "\tC";
    cout << grade << endl;
}
```

**Output**

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL

Windows PowerShell
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mation Technology\1st Year\2nd Semester\CAP281 OBJECT ORIENTED PROGRAMMING-LABORATORY\CA\CA1 CAP281 OBJECT ORIENTED PR
_Grade } ; if ($?) { .\3_Grade }
Enter marks: 89
        B
PS F:\M.Sc Information Technology\1st Year\2nd Semester\CAP281 OBJECT ORIENTED PROGRAMMING-LABORATORY\CA\CA1 CAP281 OB
```