Maharaja Agrasen Institute of Technology

Academic Year 2019-2020

C++ / Competitive Programming

Assignment No. 1

USE C OR C++. DISCUSSION WITH FRIENDS, REFERRING BOOKS AND INTERNET IS NOT ALLOWED. THE SCORES OF THIS ASSIGNMENT WILL NOT BE DISPLAYED. WE WILL USE THIS ASSIGNMENT TO GAUGE THE LEVEL OF STUDENTS. IF YOU DON'T KNOW C/C++, ONLY ATTEMPT <LOGIC> MARKED QUESTIONS.

Q1. Define an Array of pointers to integers named as "var_ptr_arr"

Q2. **<LOGIC>** Calculate the number of times "IOSD" is printed without actually running the program.

```
//n is input from user
int n;                                  //n is defined as an integer
cin>>n;                                 //input n from user
for ( int i = 0 ; i < n ; ++i ) {       //loop i from 0 to n-1 inclusive
      for ( int j = 0 ; j < 2*n ; ++j ) {     //loop j from 0 to (2*n)-1 inclusive
            cout<<"IOSD"<<endl;               //print IOSD
      }
}
```

Q3. **<LOGIC>** Write an Algorithm to check if given number is prime. You can write in pseudocode or simple english.

Q4. Convert -

A. Decimal 9 to Binary

B. Binary 100101 to Hexadecimal
C. Octal 45 to Decimal

Q5. What is the largest number you can store in unsigned int, assuming unsigned int is 4bytes long?

Q7. Define 2D array of int of size 4by4. Input each value from user, then output their sum.

Q8. **<LOGIC>** Complete the series CVBNM. Just give one 'character' that comes after this.
Hint : No math required.

Q9. **<LOGIC>** Write an algorithm to find the number of factors of a number.
Eg - input 12, ans = 6. The four factors being 1,2,3,4,6,12.

Q10. **<LOGIC>** Calculate the number of trailing zeros in (100!-1) i.e. "100 factorial minus 1".

Q11. **<LOGIC>** You are given two lists of numbers of size n and n+1 respectively. All numbers in them are common except the one extra number in the second list. What is the best possible algorithm you can think to find this extra number provided you are with given with just the 2 lists ?
Example

1	2	5	7

2	5	1	8	7

Answer here will be 8.

Prepared by-

Nandeesh Gupta and Shubh Bansal

(C++ / CP Mentors)