**Sri Sri University, Cuttack, Odisha.**

**Faculty of Science, Department of Computer Science.**

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| **Program: B.Sc. – Computer Science, Data Science, & Environmental Science**  **(2020-23 Batch)**  **Subject Code/Subject Name: Data Structure Laboratory**  **Assignment –I** | |
| **Full Name of the Student:** | VINAYAK SANJAY CHAVAN |
| **Full Roll Number:** | BCS-011 |
| **Program:** | B.Sc. (Computer Sc.) / B.Sc. (Data Sc.) / B.Sc. (Env. Sc.) |
| **Date:** | 22nd February, 2021 (10.00 AM – 12.00 Noon) |
| **Signature** |  |

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| **All Questions are compulsory** | **Total Marks: 60** |

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| **Question (s)** | **Maximum Marks** |
| 1. Write a program to print the value of the address of the pointer to a variable whose value is input from user.   **Your code:** **/\* Write a program to print the value**  **of the address of the pointer to a variable**  **whose value is input from user. \*/**  **#include <iostream>**  **using namespace std;**  **int main(){**  **int var1 =23, var2 =18, var3 =32;**  **cout<<"address of var1: "<<&var1<<endl;**  **cout<<"address of var2: "<<&var2<<endl;**  **cout<<"address of var3: "<<&var3<<endl;**  **return 0;**  **}**  **Screenshot of output:** | 10 |
| 1. Write a program to find out the greatest and the smallest among three numbers using pointers.   **Your code:** **/\* Write a program to find out the greatest**  **and the smallest among three numbers using pointers. \*/**  **#include <iostream>**  **using namespace std;**  **int main(){**  **int n1,n2,n3;**    **cout<<"enter three numbers: ";**  **cin>>n1>>n2>>n3;**    **if(n1>=n2 && n1>=n3)**  **cout<<"largest number:"<<n1;**    **if(n2>=n1 && n2>=n3)**  **cout<<"largest number:"<<n2;**    **if(n3>=n1 && n3>=n2)**  **cout<<"largest number:"<<n3;**    **return 0;**  **}**  **Screenshot of output:** | 10 |
| 1. Write a function for finding GCD and LCM of two positive integers and call them from main.(Use pointers to pass value from the main function)   **Your code:** **/\* Write a function for finding GCD and LCM of two positive integers and**  **call them from main.(Use pointers to pass value from the main function) \*/**  **#include<iostream>**  **using namespace std;**  **int ptrGCD( int \* ,int \*,int \*);**  **int main()**  **{**  **int num1,num2,result1,lcm;**  **cout<<"Enter the two positive numbers :"<<endl;**  **cin>>num1>>num2;**    **result1=ptrGCD(&num1,&num2,&lcm);**  **cout<<"The GCD of two numbers is :"<<result1<<endl;**    **cout<<"The LCM of two numbers is :"<<lcm<<endl;**  **return 0;**  **}**  **int ptrGCD(int \*ptr1, int \*ptr2, int \*lcm)**  **{**  **int temp,gcd,copy1=0,copy2=0;**    **copy1=\*ptr1;**  **copy2=\*ptr2;**    **if(\*ptr1<\*ptr2)**  **{**  **temp=\*ptr2;**  **\*ptr2=\*ptr1;**  **\*ptr1=temp;**  **}**    **while(\*ptr2!=0)**  **{**  **temp=\*ptr2;**  **\*ptr2=(int)\*ptr1%\*ptr2;**  **\*ptr1=temp;**  **}**    **gcd=\*ptr1;**  **\*lcm=(int) ((copy1)\*(copy2))/gcd;**    **return gcd;**  **}**  **Screenshot of output:** | 10 |
| 1. Write a swap function to swap the values of the argument passed to it.   **Your code:** **// Write a swap function to swap the values of the argument passed to it**  **#include <iostream>**  **using namespace std;**  **// function prototype**  **void swap(int\*, int\*);**  **int main(){**  **int a = 1, b = 2;**  **cout << "Before swapping" << endl;**  **cout << "value of a: " << a << endl;**  **cout << "value of b: " << b << endl;**  **// call function by passing variable addresses**  **swap(&a, &b);**  **cout << "after swapping" << endl;**  **cout << "value of a: " << a << endl;**  **cout << "value of b: " << b << endl;**  **return 0;**  **}**  **// swap numbers**  **void swap(int\* n1, int\* n2){**  **int temp;**  **temp = \*n1;**  **\*n1 = \*n2;**  **\*n2 = temp;**  **}**  **Screenshot of output:** | 10 |
| 1. Write a program to Calculate the length of the string using a pointer.   **Your code:** **//Write a program to Calculate the length of the string using a pointer.**  **#include <iostream>**  **#define size 100**  **using namespace std;**    **int main(){**  **char text[size];**  **char \*str = text;**  **int count = 0;**    **cout<<"Enter any string: ";**  **cin>>text;**    **while(\*(str++)!= '\0'){**  **count++;**  **}**    **cout<<"Length of "<<text<<" is "<<count;**  **return 0;**  **}**  **Screenshot of output:** | 10 |
| 1. Write a program to count the number of vowels and consonants in a string using a pointer.   **Your code:** **#include <iostream>**  **using namespace std;**  **int main()**  **{**  **string line;**  **int vowels=0, consonants=0;**    **cout << "Enter a line of string: ";**  **getline(cin, line);**  **for(int i = 0; i < line.length(); ++i)**  **{**  **if(line[i]=='a' || line[i]=='e' || line[i]=='i' ||**  **line[i]=='o' || line[i]=='u' || line[i]=='A' ||**  **line[i]=='E' || line[i]=='I' || line[i]=='O' ||**  **line[i]=='U')**  **{**  **++vowels;**  **}**  **else if((line[i]>='a'&& line[i]<='z') || (line[i]>='A'&& line[i]<='Z'))**  **{**  **++consonants;**  **}**  **}**  **cout << "Vowels: " << vowels << endl;**  **cout << "Consonants: " << consonants << endl;**  **return 0;**  **}**  **Screenshot of output:** | 10 |
| **Additional question:**   1. Write a program in C to sort an array using Pointer. | Practice |