Faculty of Computer Applications
SATAVAHANA UNIVERSITY, KARIM NAGAR
B.Com Comp Applications (CBCS-R-19) Semester-II

Programming with C & C++

Practical Solutions w.e.f 2019-2020

Max Marks: 20] **[3 Hours /Week**

1. Write a program- to find the greatest of three numbers using ternary operator

Source Code:

```
# include <stdio.h>
void main()
{
int a, b, c, big ;
printf("Enter three numbers : ") ;
scanf("%d %d %d", &a, &b, &c) ;
big = a > b ? (a > c ? a : c) : (b > c ? b : c) ;
printf("\nThe biggest number is : %d", big) ;
}
```

OUTPUT:

```
Enter three numbers:10  25  12
The biggest number is: 25
```

2. Write a program to check whether given number is palindrome or not

Source Code:

```
#include <stdio.h>
int main()
{   int n, rev = 0, rem, t;
   printf("Enter an integer: ");
   scanf("%d", &n);
   t = n;
   while (n != 0)
{      rem = n % 10;
      rev= rev* 10 + rem;
      n =n/ 10;    }
   if (t== rev)
      printf("%d is a palindrome.", t);
   else
      printf("%d is not a palindrome.", t);
   return 0;
}
```

OUTPUT:

```
Enter an integer: 12321
12321 is a palindrome.
```

3. Write a program to print the prime numbers from 2 to n where n is given by user

```
#include<stdio.h>
void main()
{
    int i,j,n;
    printf("Enter the number till which you want prime numbers\n");
    scanf("%d",&n);
    printf("Prime numbers are:-\n");
    for(i=2;i<=n;i++)
    {
        int c=0;
        for(j=1;j<=i;j++)
        {
            if(i%j==0)
            {
                c++;
            }
        }
       if(c==2)
        {
            printf("%d ",i);
        }
    }
   }
```

OUTPUT:

```
Enter the number till which you want prime numbers25
Prime numbers are:-
2 3 5 7 11 13 17 21 23
```

4. Create menu driven application using switch to find addition, subtraction, multiplication and division of two numbers

Source Code:

```
#include <stdio.h>
int main()
{
  char operator;
  double first, second;
  printf("Enter an operator (+, -, *,): ");
  scanf("%c", &operator);
  printf("Enter two operands: ");
  scanf("%lf %lf", &first, &second);
  switch (operator)
{
```

```
        case '+':
            printf("%.1lf + %.1lf = %.1lf", first, second, first + second);
            break;
        case '-':
            printf("%.1lf - %.1lf = %.1lf", first, second, first - second);
            break;
        case '*':
            printf("%.1lf * %.1lf = %.1lf", first, second, first * second);
            break;
        case '/':
            printf("%.1lf / %.1lf = %.1lf", first, second, first / second);
            break;
        default:
            printf("Error! operator is not correct");
        }
        return 0;
    }
```

OUTPUT:

```
Enter an operator (+, -, *,): *
Enter two operands: 1.5, 4.5
    1.5 * 4.5 = 8.1
```

5. Write a program to sort the elements of an Array using bubble sort technique

Source Code:

```
#include <stdio.h>
void swap(int *xp, int *yp)
{
    int temp = *xp;
    *xp = *yp;
    *yp = temp;
}
void bubbleSort(int arr[], int n)
{
  int i, j;
  for (i = 0; i < n-1; i++)
      for (j = 0; j < n-i-1; j++)
          if (arr[j] > arr[j+1])
              swap(&arr[j], &arr[j+1]);
}
void printArray(int arr[], int size)
{
    int i;
    for (i=0; i < size; i++)
        printf("%d ", arr[i]);
    printf("\n");
}
int main()
```

```
{
   int arr[] = {64, 34, 25, 12, 22, 11, 90};
   int n = sizeof(arr)/sizeof(arr[0]);
   bubbleSort(arr, n);
   printf("Sorted array: \n");
   printArray(arr, n);
   return 0;
}
```

Output:

```
Sorted array:
11 12 22 25 34 64 90
```

6. Write a program to search an element in an array using binary search method

Source Code:

```
#include <stdio.h>
int main()
{
 int c, first, last, middle, n, search, array[100];
 printf("Enter number of elements\n");
 scanf("%d", &n);
 printf("Enter %d integers\n", n);
 for (c = 0; c < n; c++)
  scanf("%d", &array[c]);
 printf("Enter search element\n");
 scanf("%d", &search);
 first = 0;
 last = n - 1;
 middle = (first+last)/2;
 while (first <= last) {
  if (array[middle] < search)
   first = middle + 1;
  else if (array[middle] == search) {
   printf("%d found at location %d.\n", search, middle+1);
   break;
  }
  else
   last = middle - 1;
  middle = (first + last)/2;
 }
 if (first > last)
  printf("Not found! %d isn't present in the list.\n", search);
 return 0;
}
```

OUTPUT:

```
Enter number of elements
7
Enter 7 integers
```

```
-4
5
8
9
11
43
485
Enter search element 11
11 found at location 5
```

7. Write a program to find the product of two matrices

Source Code:

```
#include <stdio.h>
 int main()
 {
  int m, n, p, q, c, d, k, sum = 0;
  int first[10][10], second[10][10], multiply[10][10];
  printf("Enter number of rows and columns of first matrix\n");
  scanf("%d%d", &m, &n);
  printf("Enter elements of first matrix\n");
 for (c = 0; c < m; c++)
   for (d = 0; d < n; d++)
    scanf("%d", &first[c][d]);
  printf("Enter number of rows and columns of second matrix\n");
  scanf("%d%d", &p, &q);
  if (n != p)
   printf("The multiplication isn't possible.\n");
  else
  {
   printf("Enter elements of second matrix\n");
   for (c = 0; c < p; c++)
    for (d = 0; d < q; d++)
     scanf("%d", &second[c][d]);
  for (c = 0; c < m; c++) {
    for (d = 0; d < q; d++) {
     for (k = 0; k < p; k++) {
      sum = sum + first[c][k]*second[k][d];
     }
     multiply[c][d] = sum;
     sum = 0;
    }
   }
   printf("Product of the matrices:\n");
   for (c = 0; c < m; c++) {
    for (d = 0; d < q; d++)
     printf("%d\t", multiply[c][d]);
    printf("\n");
   }
```

```
    }
    return 0;
}
```

OUTPUT:

```
Enter number of rows and columns of first matrix
3
3
Enter elements of first matrix
1 2 0
0 1 1
2 0 1
Enter number of rows and columns of second matrix
3
3
Enter elements of second matrix
1 1 2
2 1 1
1 2 1
Product of the matrices
5   3   4
3   3   2
3   4   5
```

8. Write a program to print Fibonacci numbers using function (0 1 1 2 3 5 8…)

Source Code:

```
#include<stdio.h>
    int fib(int);
    int main()
    {
     int n, i = 0, c;
     printf("Enter number of Terms");
     scanf("%d", &n);
     printf("Fibonacci series terms are:\n");
     for (c = 1; c <= n; c++)
     {
       printf("%d\t", fib(i));
       i++;
     }
     return 0;
    }
    int fib(int n)
    {
     if (n == 0 || n == 1)
       return n;
     else
```

```
    return (fib(n-1) + fib(n-2));
  }
```

OUTPUT:

```
Enter number of Terms10
Fibonacci series terms are:
0    1    1    2    3    5    8    13    21    34
```

9. Write a program to find the factorial of a given number using recursion

Source Code:

```
#include<stdio.h>
long int multiplyNumbers(int n);
int main() {
   int n;
   printf("Enter a positive integer: ");
   scanf("%d",&n);
   printf("Factorial of %d = %ld", n, multiplyNumbers(n));
   return 0;
}
long int multiplyNumbers(int n)
{
   if (n>=1)
      return n*multiplyNumbers(n-1);
   else
      return 1;
}
```

OUTPUT:

```
Enter a positive integer: 6
Factorial of 6 = 720
```

10. Write a program to demonstrate call by value & call by reference

Source Code: Call By Value

```
#include <stdio.h>
void swapnum( int var1, int var2 )
{
  int tempnum ;
  tempnum = var1 ;
  var1 = var2 ;
  var2 = tempnum ;
}
int main( )
{
   int num1 = 35, num2 = 45 ;
   printf("Before swapping: %d, %d", num1, num2);
   swapnum(num1, num2);
   printf("\nAfter swapping: %d, %d", num1, num2);
}
```

OUTPUT:

Before swapping: 35, 45
After swapping: 35, 45

Source Code: Call By Reference

```
#include<stdio.h>
void swapnum ( int *var1, int *var2 )
{
  int tempnum ;
  tempnum = *var1 ;
  *var1 = *var2 ;
  *var2 = tempnum ;
}
int main( )
{
  int num1 = 35, num2 = 45 ;
  printf("Before swapping:");
  printf("\nnum1 value is %d", num1);
  printf("\nnum2 value is %d", num2);
  swapnum( &num1, &num2 );
  printf("\nAfter swapping:");
  printf("\nnum1 value is %d", num1);
  printf("\nnum2 value is %d", num2);
  return 0;
}
```

OUTPUT:

Before swapping:
num1 value is 35
num2 value is 45
After swapping:
num1 value is 45
num2 value is 35

11. Write a program to concatenate two strings using string functions

Source Code:

```
#include <stdio.h>
#include <string.h>
int main()
{
   char a[100], b[100];
    printf("Enter the first string\n");
   gets(a);
    printf("Enter the second string\n");
   gets(b);
    strcat(a,b);
    printf("String obtained on concatenation is %s\n",a);
    return 0;
}
```

OUTPUT:
Enter the first string
sucomputers
Enter the second string
forum
String obtained on concatenation is sucomputersforum

12. Write a program to create a student structure containing fields for roll no., name, class, total marks

Source Code:

```
#include <stdio.h>
#include<conio.h>
struct student
{
   char firstName[50];
   int roll;
   char class[10];
   int marks;
} s[10];
int main()
{
   int i;
   printf("Enter information of students:\n");
   for (i = 0; i < 3; ++i) {
      s[i].roll = i + 1;
      printf("\nFor roll number%d,\n", s[i].roll);
      printf("Enter first name: ");
      scanf("%s", s[i].firstName);
      printf("Enter Class");
      scanf("%s",&s[i].class);
      printf("Enter marks: ");
      scanf("%d", &s[i].marks);
   }
   printf("Displaying Information:\n\n");
   for (i = 0; i < 3; ++i) {
      printf("\nRoll number: %d\t", i + 1);
      printf("First name: ");
      printf("%s\t",s[i].firstName);
      printf("Class is :");
      printf("%s\t",s[i].class);
      printf("Marks: %.1d", s[i].marks);
      printf("\n");
   }
   return 0;
}
```

OUTPUT:
Enter information of students:

```
For roll number1,
Enter first name: waseem
Enter Class12
Enter marks: 56

For roll number2,
Enter first name: Raa za
Enter Class98  14
Enter marks: 98

For roll number3,
Enter first name: Ra  Raju
Enter Class15
Enter marks: 88
Displaying Information:
Roll number: 1      First name: waseem  Class is :12    Marks: 56
Roll number: 2      First name: Raza    Class is :14    Marks: 98
Roll number: 3      First name: Raju    Class is :15    Marks: 88
```

13. Write a program to create array of structure containing fields for empid, name, and salary

Source Code:

```
#include <iostream>
using namespace std;
struct employee {
   string ename;
   int eid, phn_no;
   int salary;
};
void display(struct employee emp[], int n)
{
   cout << "Name\tEid\tPhone Number\tSalary\n";
   for (int i = 0; i < n; i++) {
      cout << emp[i].ename << "\t" << emp[i].eid << "\t"
         << emp[i].phn_no << "\t" << emp[i].salary << "\n";
   }
}
int main()
{
   int n = 3;
   struct employee emp[n];
   emp[0].ename = "Kalyan";
   emp[0].eid = 24;
   emp[0].phn_no = 1234567788;
   emp[0].salary = 20000;
   emp[1].ename = "Krishna";
   emp[1].eid = 31;
   emp[1].phn_no = 1234567891;
```

```
        emp[1].salary = 56000;
        emp[2].ename = "Rajkumar";
        emp[2].eid = 45;
        emp[2].phn_no = 1100661111;
        emp[2].salary = 30500;
        display(emp, n);
        return 0;
            }
```

OUTPUT :

```
Name    Eid   Phone Number   Salary
Kalyan  24    1234567788     20000
Krishna 31    1234567891     56000
Rajkumar 45   8881101111     30500
```

14. Write a program to read student name, rollno, marks and display the same using classes and objects

Source Code:

```
#include <iostream>
using namespace std;
class student
{
private:
        char  name[30];
        int   rollNo;
        int   total;
        float perc;
public:
        void getDetails(void);
        void putDetails(void);
};
void student::getDetails(void)
{
        cout << "Enter name: " ;
        cin >> name;
        cout << "Enter roll number: ";
        cin >> rollNo;
        cout << "Enter total marks outof 500: ";
        cin >> total;
        perc=(float)total/500*100;
}
void student::putDetails(void)
{
        cout << "Student details:\n";
        cout << "Name:"<< name << "\t Roll Number:" << rollNo << "\tTotal:" << total <<
                "\tPercentage:" << perc;
}
```

```
int main()
{
        student std;
        std.getDetails();
        std.putDetails();
        return 0;
}
```

OUTPUT:

```
Enter name: Waseem
Enter roll number: 25
Enter total marks outof 500: 460
Student details:
Name:Waseem          Roll Number:25        Total:460        Percentage:92
```

15. Write a program to read employee name, empid, salary and display the same using classes and objects

```
#include "iostream"
using namespace std;
class Employee
{
 int Id;
 char Name[25];
 int Age;
 long Salary;
public:
void GetData ()
{
   std::cout<< "\n\tEnter Employee Id : ";
   std::cin >> Id;
   std::cout << "\n\tEnter Employee Name : ";
   std::cin >> Name;
   std::cout << "\n\tEnter Employee Age : ";
   std::cin >> Age;
   std::cout << "\n\tEnter Employee Salary : ";
   std::cin >> Salary;
 }
void PutData ()
 {
 std::cout << "\n\nEmployee Id : " << Id;
 std::cout << "\nEmployee Name : " << Name;
 std::cout << "\nEmployee Age : " << Age;
 std::cout << "\nEmployee Salary : " << Salary;
  }
};
int main ()
{

Employee E;
```

```
 E.GetData ();
 E.PutData ();
return 0;

}
```

OUTPUT:

```
        Enter Employee Id : 101
        Enter Employee Name : waseem
        Enter Employee Age : 33
        Enter Employee Salary : 25000

Employee Id : 101
Employee Name : waseem
Employee Age : 33
Employee Salary : 25000
```