ACROPOLIS INSTITUTE OF TECHNOLOGY & RESEARCH, INDORE

ACROPOLIS
Enlightening Wisdom

PRACTICAL JOURNAL OF PRINCIPLES OF PROGRAMMING LANGUAGES

(CS-6002)

BE: Third-Year

Department of Computer Science & Engineering

Name of Student : **Shachita Jain**

Branch & Section : **CS D**

Roll Number : **0827CS161203**

Year : **III**

Department of Computer Science &Engineering

AITR, INDORE

ACROPOLIS INSTITUTE OF TECHNOLOGY & RESEARCH, INDORE

Department of Computer Science & Engineering

CERTIFICATE

This is to certify that the experimental work entered in this journal as per the BE **Third** year syllabus prescribed by the RGPV was done by Mr. **Shachita Jain (0827CS161203)** BE **III-year VI** semester in the **Principles of Programming Languages** Laboratory of this institute during the academic year **2018-2019**.

Signature of Head **Signature of Faculty**

Week-1 OPERATORS AND EVALUATION OF EXPRESSIONS (DATE: 31/01/19)

a. Write a C program to check whether a number is even or odd using ternary operator.

b. Write a C program to perform the addition of two numbers without using + operator.

c. Write a C program to evaluate the arithmetic expression ((a + b / c * d - e) * (f - g)). Read the values a, b, c, d, e, f, g from the standard input device.

d. Write a C program to find the sum of individual digits of a 3 digit number.

e. Write a C program to read the values of x and y and print the results of the following expressions in one line:

   i. (x + y) / (x - y)
   ii. (x + y)(x - y)

Signature: _____

Grade for Week-1:

Week-2 CONTROL STRUCTURES (DATE: 14/02/19)

a. Write a C program to find the sum of individual digits of a positive integer.

b. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

c. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

d. A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case. The following table shows the range of ASCII values for various characters.

Characters	ASCII values
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127

e. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Write a C program to determine how much profit or loss incurred in percentage.

Signature: _____

Grade for Week-2:

Week-3 CONTROL STRUCTURES (DATE: 28/02/19)

a. Write a C program, which takes two integer operands and one operator from the user, performs the operation and then prints the result. (Consider the operators +, -, *, /, % and use switch statement).

b. Write a Write a C program to calculate : $1 - x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^{10}/10!$

c. Write a C program to find the roots of a quadratic equation.

d. Write a C program to check whether a given 3 digit number is Armstrong number or not.

e. Write a C program to print the numbers in triangular form

1

1 2

1 2 3

1 2 3 4

Signature: _____

Grade for Week-3:

Week-4 ARRAYS (DATE: 14/03/19)

a. Write a C program to find the second largest integer in a list of integers.

b. Write a C program to perform the following:

i. Addition of two matrices
ii. Multiplication of two matrices

c. Write a C program to count and display positive, negative, odd and even numbers in an array.

d. Write a C program to merge two sorted arrays into another array in a sorted order.

e. Write a C program to find the frequency of a particular number in a list of integers.

Signature: _____

Grade for Week-4:

Week-5 STRINGS (DATE: 28/03/19)

a. Write a C program that uses functions to perform the following operations:

i. To insert a sub string into a given main string from a given position.
ii. To delete n characters from a given position in a given string.

b. Write a C program to determine if the given string is a palindrome or not.

c. Write a C program to find a string within a sentence and replace it with another string.

d. Write a C program that reads a line of text and counts all occurrence of a particular word.

e. Write a C program that displays the position or index in the string S where the string T begins, or 1 if S doesn't contain T.

Signature: _____

Grade for Week-5:

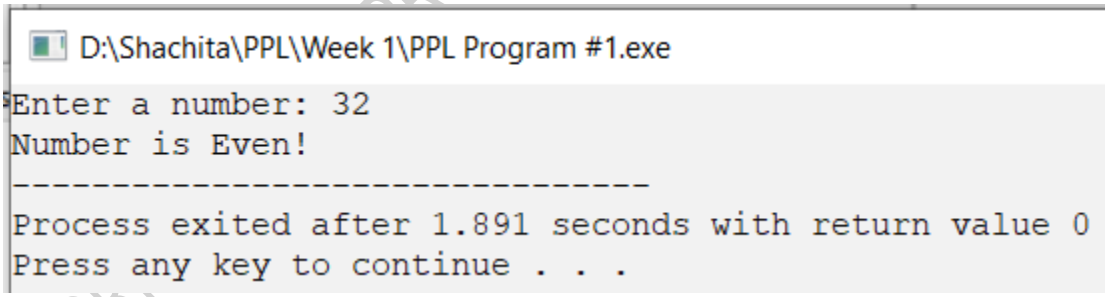
Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 01	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-1: WRITE A C PROGRAM TO CHECK WHETHER A NUMBER IS EVEN OR ODD USING TERNARY OPERATOR.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int a;
   cout << "Enter a number: ";
   cin >> a;
    (a%2==0)? cout << "Number is Even!": cout << "Number is Odd!";
   return 0;
}
```

OUTPUT SCREEN:



Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 01	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-2: WRITE A C PROGRAM TO PERFORM THE ADDITION OF TWO NUMBERS WITHOUT USING + OPERATOR.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int a,b;
   cout << "Enter number 1: ";
   cin >> a;
   cout << "Enter number 2: ";
   cin >> b;
   cout << "Addition is: " << a-(~b) - 1;
   return 0;
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 1\PPL Program #2.exe
Enter number 1: 5
Enter number 2: 6
Addition is: 11
--------------------------------
Process exited after 1.838 seconds with return value 0
Press any key to continue . . .
```

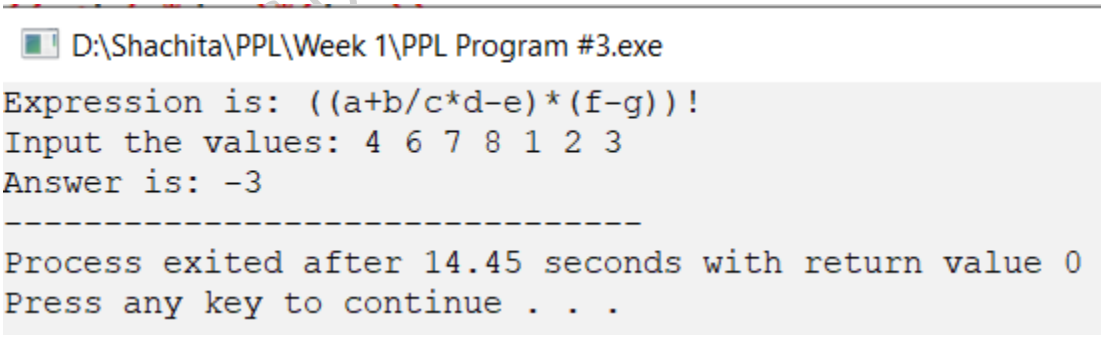
Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 01	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-3: WRITE A C PROGRAM TO EVALUATE THE ARITHMETIC EXPRESSION ((A + B / C * D - E) * (F - G)). READ THE VALUES A, B, C, D, E, F, G FROM THE STANDARD INPUT DEVICE.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int a,b,c,d,e,f,g;
   cout << "Expression is: ((a+b/c*d-e)*(f-g))!\n" ;
   cout << "Input the values: ";
   cin >> a>> b>> c>> d>> e>> f>> g;
   cout << "Answer is: " << ((a+b/c*d-e)*(f-g));
   return 0;
}
```

OUTPUT SCREEN:



Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 01	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-4: WRITE A C PROGRAM TO FIND THE SUM OF INDIVIDUAL DIGITS OF A 3 DIGIT NUMBER.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int a,sum=0, rem=0;
   do{
   cout << "Enter a 3 digit number: ";
   cin >> a;
   }while(a< 100 || a > 999);
   while(a){
      rem = a%10;
      sum += rem;
      a /=10;
   }
   cout << "Sum of digits is: "<< sum;
   return 0;
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 1\PPL Program #4.exe
Enter a 3 digit number: 423
Sum of digits is: 9
--------------------------------
Process exited after 3.44 seconds with return value 0
Press any key to continue . . .
```

Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 01	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-5: WRITE A C PROGRAM TO READ THE VALUES OF X AND Y AND PRINT THE RESULTS OF THE FOLLOWING EXPRESSIONS IN ONE LINE:

I. (X + Y) / (X - Y)

II. (X + Y)(X - Y)

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   double x,y;
   cout << "Enter x: ";
   cin >> x;
   cout << "Enter y: ";
   cin >> y;
   cout << "i. (x+y)/(x-y) = " << (x+y)/(x-y)<<"\n";
   cout << "ii. (x+y)(x-y) = " << (x+y)*(x-y);
   return 0;
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 1\PPL Program #5.exe
Enter x: 6
Enter y: 9
i. (x+y)/(x-y) = -5
ii. (x+y)(x-y) = -45
--------------------------------
Process exited after 6.18 seconds with return value 0
Press any key to continue . . .
```

Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 02	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-1: WRITE A C PROGRAM TO FIND THE SUM OF INDIVIDUAL DIGITS OF A POSITIVE INTEGER.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int a,rem=1, sum=0;
   do{
      cout << "Enter a number: ";
      cin >> a;
   }while(a<0);
   while(a){
      rem = a % 10;
      a/=10;
      sum+=rem;
   }
   cout << "Sum of digits is: " << sum;
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 2\PPL Program #1.exe
Enter a number: 309
Sum of digits is: 12
--------------------------------
Process exited after 12.26 seconds with return value 0
Press any key to continue . . .
```

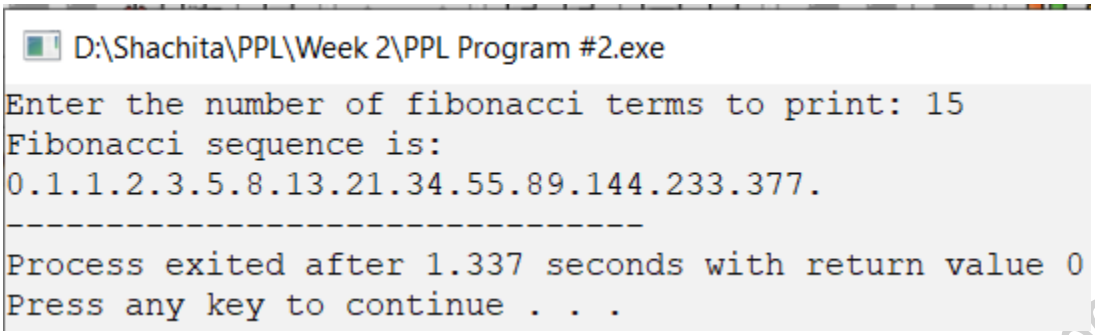
Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 02	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-2: A FIBONACCI SEQUENCE IS DEFINED AS FOLLOWS: THE FIRST AND SECOND TERMS IN THE SEQUENCE ARE 0 AND 1. SUBSEQUENT TERMS ARE FOUND BY ADDING THE PRECEDING TWO TERMS IN THE SEQUENCE. WRITE A C PROGRAM TO GENERATE THE FIRST N TERMS OF THE SEQUENCE.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int n,a=0,b=1;
   cout << "Enter the number of fibonacci terms to print: ";
   cin >> n;
   cout << "Fibonacci sequence is: \n";
   for(int i=0; i<n;++i){
      if(i==0) {
         cout << a;
         a=b;
      }
      else if(i==1) cout << b;
      else {
         int c= a;
         a=b;
         b+=c;
         cout << a;
      }
      cout << ".";
   }
   return 0;
}
```

OUTPUT SCREEN:



Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 02	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-3: WRITE A C PROGRAM TO GENERATE ALL THE PRIME NUMBERS BETWEEN 1 AND N, WHERE N IS A VALUE SUPPLIED BY THE USER.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int n;
   cout << "Enter the number to print prime numbers upto: ";
   cin >>n;
   for( int i= 1; i<=n; ++i){
      bool prime = true;
      if(i==1) continue;
      for(int j=2; j<=std::sqrt(i); ++j){
         if(i%j == 0 ) {
            prime= false;
            break;
         }}
      if(prime) cout << i << ".";
   }
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 2\PPL Program #3.exe
Enter the number to print prime numbers upto: 60
2.3.5.7.11.13.17.19.23.29.31.37.41.43.47.53.59.
--------------------------------
Process exited after 1.545 seconds with return value 0
Press any key to continue . . .
```

Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 02	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

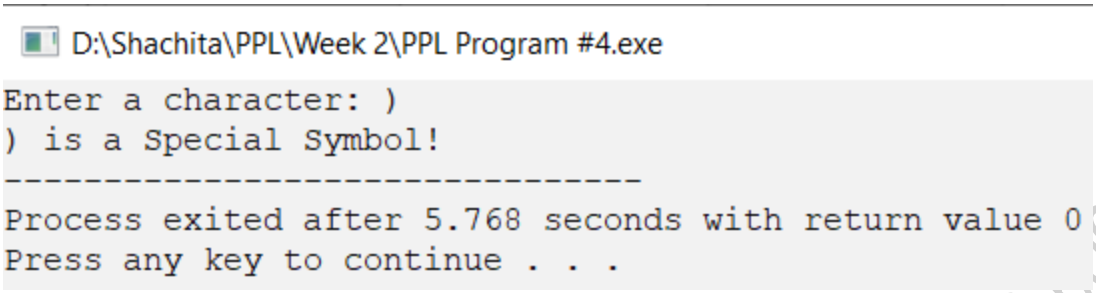
NAME OF PROGRAM-4: A CHARACTER IS ENTERED THROUGH KEYBOARD. WRITE A C PROGRAM TO DETERMINE WHETHER THE CHARACTER ENTERED IS A CAPITAL LETTER, A SMALL CASE LETTER, A DIGIT OR A SPECIAL SYMBOL USING IF-ELSE AND SWITCH CASE. THE FOLLOWING TABLE SHOWS THE RANGE OF ASCII VALUES FOR VARIOUS CHARACTERS.

Characters	ASCII values
A – Z	65 – 90
a – z	97 – 122
0 – 9	48 – 57
Special symbols	0 – 47, 58 – 64, 91 – 96, 123 – 127

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int n;
   cout << "Enter the number to print prime numbers upto: ";
   cin >>n;
   for( int i= 1; i<=n; ++i){
      bool prime = true;
      if(i==1) continue;
      for(int j=2; j<=std::sqrt(i); ++j){
         if(i%j == 0 ) {
            prime= false;
            break;
        }
      }
      if(prime) cout << i << ".";}}
```

OUTPUT SCREEN:



Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 02	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-5: IF COST PRICE AND SELLING PRICE OF AN ITEM IS INPUT THROUGH THE KEYBOARD, WRITE A PROGRAM TO DETERMINE WHETHER THE SELLER HAS MADE PROFIT OR INCURRED LOSS. WRITE A C PROGRAM TO DETERMINE HOW MUCH PROFIT OR LOSS INCURRED IN PERCENTAGE.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int cp, sp, profit=0, loss=0;
   cout << "Enter Cost Price: ";
   cin >> cp;
   cout << "Enter Selling Price: ";
   cin >> sp;

   if(sp>cp) {
      cout << "Profit Earned: " << sp-cp << " Percentage: " << ((float)(sp-cp)/cp)*100 << "%";
   }
   else cout << "Lost Incurred: " << cp-sp << " Percentage: " << ((float)(cp-sp)/cp)*100 << "%";
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 2\PPL Program #5.exe
Enter Cost Price: 200
Enter Selling Price: 150
Lost Incurred: 50 Percentage: 25%
--------------------------------
Process exited after 5.517 seconds with return value 0
Press any key to continue . . .
```

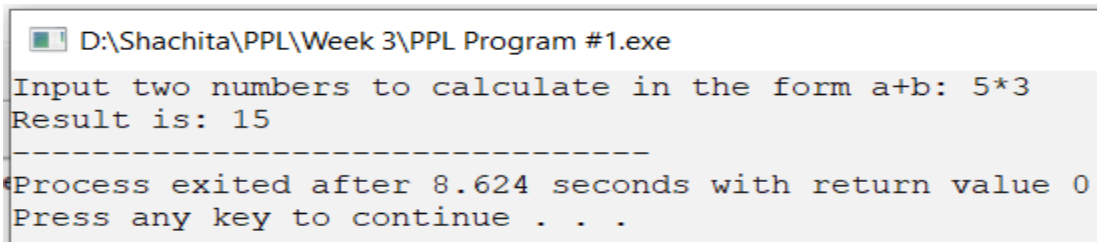
Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 03	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-1: WRITE A C PROGRAM, WHICH TAKES TWO INTEGER OPERANDS AND ONE OPERATOR FROM THE USER, PERFORMS THE OPERATION AND THEN PRINTS THE RESULT. (CONSIDER THE OPERATORS +, -, *, /, % AND USE SWITCH STATEMENT).

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int a, b;  char c;
   cout << "Input two numbers to calculate in the form a+b: ";
   cin >> a>>c>>b;
   cout << "Result is: ";
   switch(c){
      case '+':
         cout << a+b; break;
      case '/':
         cout << a/b; break;
      case '*':
         cout << a*b; break;
      case '-':
         cout << a-b; break;
      case '%':
         cout << a%b; break;
   }
}
```

OUTPUT SCREEN:



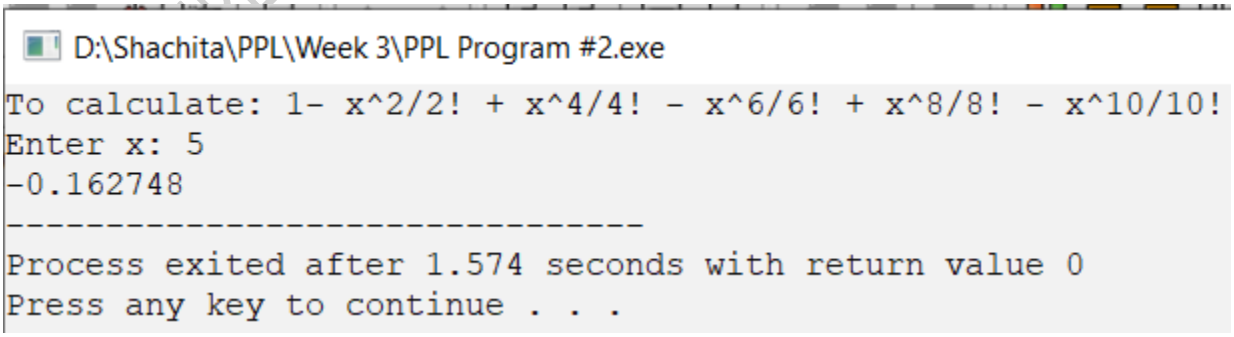
Enrollment No: 0827CS161203	Week Number: 03	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-2: WRITE A C PROGRAM TO CALCULATE: 1 - x2/2! + x4/4! – x6/6! + x8/8! – x10/10!

SOURCE CODE:

```
#include <iostream>
using namespace std;
float power(int x, int num){
 int k =x;
 for(int i= 1; i< num; ++i) x = k*x;
 return x;
}
int fact(int n){
 return n==0 ? 1 : fact(n-1)*n;
}
int main(){
   int x;

    cout << "To calculate: 1- x^2/2! + x^4/4! - x^6/6! + x^8/8! - x^10/10! \nEnter x: ";

    cin >> x;

    cout << 1 - (power(x,2)/ fact(2)) + (power(x,4)/ fact(4)) - (power(x,6)/ fact(6)) + (power(x,8)/ fact(8)) -
(power(x,10)/ fact(10)) ;

    return 0;

}
```

OUTPUT SCREEN:



Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 03	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-3: WRITE A C PROGRAM TO FIND THE ROOTS OF A QUADRATIC EQUATION.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int checkroots(int desc){
   if(desc==0) return 1;
   else if(desc>0) return 2;
   else return 3;
}
int main(){
   float a,b,c;
   cout << "A quadratic equation is in the form of: ax^2+bx+c=0\n";
   cout << "Enter values for a, b and c: ";
   cin >> a >> b >> c;
   cout << endl;
   int desc = (b*b) - (4*a*c);
   switch(checkroots(desc)){
      case 1 :
         cout << "Real and Equal Roots:\n";
         cout << "x = " << -b/(2*a);
         break;
      case 2:
         cout << "Real and Different Roots\n";
         cout << "x1 = " << (-b + std::sqrt(desc))/(2*a) << "\tx2 = " << (-b - std::sqrt(desc))/(2*a);
         break;
      case 3:
         cout << "Imaginary Roots:\n";
         cout << "x1 = " << -b/ (2*a) << "+" << std::sqrt(-desc)/(2*a)<< "i\t";
         cout << "x2 = " << -b/ (2*a) << "-" << std::sqrt(-desc)/(2*a)<< "i";
```

```
  }
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 3\PPL Program #3.exe
A quadratic equation is in the form of: ax^2+bx+c=0
Enter values for a, b and c: 4 0 9

Imaginary Roots:
x1 = -0+1.5i    x2 = -0-1.5i
--------------------------------
Process exited after 17.62 seconds with return value 0
Press any key to continue . . .
```

Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 03	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-4: WRITE A C PROGRAM TO CHECK WHETHER A GIVEN 3 DIGIT NUMBER IS ARMSTRONG NUMBER OR NOT.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int x,digits=0,sum=0;
   cin >> x;
   int temp =x;
   while(x){
      x /= 10;
      digits++;
   }
   x=temp;
   while(temp){
      int rem= temp%10;
      sum += std::pow(rem, digits);
      temp/=10;
   }
   if(sum==x) cout << "Armstrong Number!";
   else cout << "Not an Armstrong Number :(";
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 3\PPL Program #4.exe
370
Armstrong Number!
--------------------------------
Process exited after 1.307 seconds with return value 0
Press any key to continue . . .
```

Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 03	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

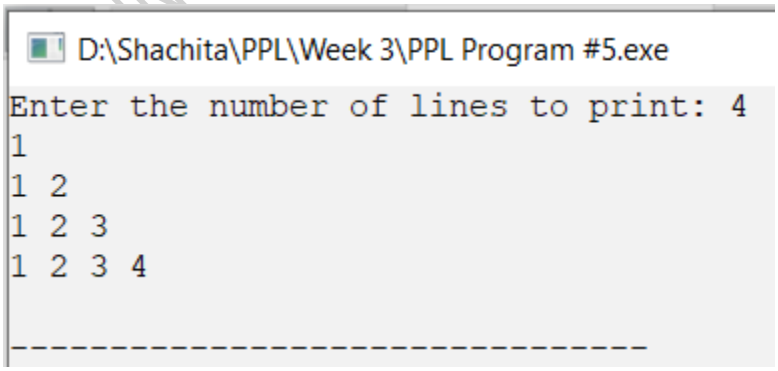
NAME OF PROGRAM-5: WRITE A C PROGRAM TO PRINT THE NUMBERS IN TRIANGULAR FORM

```
1
1 2
1 2 3
1 2 3 4
```

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int x;
   cout << "Enter the number of lines to print: ";
   cin >> x;
   int r=0;
   while(++r<=x){
      for(int i=1;i<=r;++i){
         cout << i << " ";
      }
      cout << std::endl;
   }
}
```

OUTPUT SCREEN:



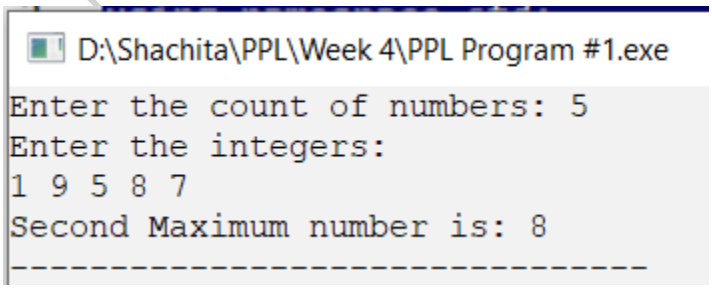
Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 04	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
Remarks by faculty:		Grade:
Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-1: WRITE A C PROGRAM TO FIND THE SECOND LARGEST INTEGER IN A LIST OF INTEGERS.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   int n, max, smax;
   cout << "Enter the count of numbers: ";
   cin >> n;
   int a[n];
   cout << "Enter the integers: \n";
   for(int i=0; i<n;++i){
         cin >> a[i];
         if(i==0) max = a[i];

                  if(a[i] > max) smax = max,max = a[i] ;
                  else if(i==1) smax = a[i];
                  else if(a[i] > smax) smax = a[i];
   }
         cout << "Second Maximum number is: " << smax;
}
```

OUTPUT SCREEN:



Name of Student: Shachita Jain		Class: CS-D
Enrollment No: 0827CS161203	Week Number: 04	Batch: B1
Date of Experiment:	Date of Submission:	Submitted on:
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Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-2: WRITE A C PROGRAM TO PERFORM THE FOLLOWING:

iii. ADDITION OF TWO MATRICES
iv. MULTIPLICATION OF TWO MATRICES

SOURCE CODE:

```
#include <iostream>

#include <vector>

using namespace std;

#define vect(a,b) (a, vector<int>(b, 0))

bool checkAddition(int a, int b, int c, int d){

   if(a!=c) return false;

   if(b!=d) return false;

    return true;

}

bool checkMultiplication(int a, int b, int c, int d){

   if(b!=c) return false;

   return true;

}

void TakeMatrix(vector<vector<int> > &mat){

   for(int i=0; i< mat.size();++i){

      cout << "Enter elements from row " << i+1 << ", space seperately:";

      for(int j=0; j<mat[i].size() ; ++j) cin >> mat[i][j];}}

void printMatrix(vector<vector<int> > &mat){

   for(int i=0; i<mat.size();++i){
```

```
        cout << "\t| ";
        for(int j = 0; j<mat[i].size(); ++j) cout << mat[i][j] << " ";
        cout << "|\n";}}
void Addition(int a, int b){
    vector<vector<int> > matA vect(a,b), matB vect(a,b), matC vect(a,b);
    cout << "Enter Matrix A: \n"; TakeMatrix(matA);
    cout << "Enter Matrix B: \n"; TakeMatrix(matB);
    for(int i=0; i<a; ++i) for(int j=0; j<b;++j) matC[i][j] = matA[i][j] + matB[i][j];
    cout << "\nMatrix A + Matrix B :\n" ; printMatrix(matC);}
void Multiplication(int a, int b, int d){
    vector<vector<int> > matA vect(a,b), matB vect(b,d), matC vect(a,d);
    cout << "Enter Matrix A: \n"; TakeMatrix(matA);
    cout << "Enter Matrix B: \n"; TakeMatrix(matB);
    for(int i=0; i<a; ++i) for(int j=0; j<d;++j) for(int k=0; k<b;++k) matC[i][j] += matA[i][k] * matB[k][j];
    cout << "\nMatrix A x Matrix B :\n" ; printMatrix(matC);
}
int main(){
  int a, b , c , d;
  cout << "Enter Order of the Matrix A (m x n): ";
    cin >> a >> b;
    cout << "Enter Order of the Matrix B (m x n): ";
    cin >> c >> d;
    char op;
    cout << "Enter + for Addition\nEnter * for Multiplication\n";
    cin >> op;
    switch(op){
        case '+':
            if(!checkAddition(a,b,c,d)) {
```

```
            cout << "Addition not possible!";
            return -1;
          }
          Addition(a,b);
          break;
        case '*':
          if(!checkMultiplication(a,b,c,d)){
            cout << "Multiplication not possible!";
            return -1;
          }
          Multiplication(a,b,d);
          break;
    }
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 4\PPL Program #2.exe
Enter Order of the Matrix A (m x n): 3 3
Enter Order of the Matrix B (m x n): 3 3
Enter + for Addition
Enter * for Multiplication
+
Enter Matrix A:
Enter elements from row 1, space seperately:1 0 0
Enter elements from row 2, space seperately:0 1 0
Enter elements from row 3, space seperately:0 0 1
Enter Matrix B:
Enter elements from row 1, space seperately:0 1 1
Enter elements from row 2, space seperately:1 0 1
Enter elements from row 3, space seperately:1 1 0

Matrix A + Matrix B :
        | 1 1 1 |
        | 1 1 1 |
        | 1 1 1 |

--------------------------------
Process exited after 23.4 seconds with return value 0
Press any key to continue . . .
```

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NAME OF PROGRAM-3: WRITE A C PROGRAM TO COUNT AND DISPLAY POSITIVE, NEGATIVE, ODD AND EVEN NUMBERS IN AN ARRAY.

SOURCE CODE:

```
#include <iostream>
using namespace std;
#define loop(a,b) for(int i=0;i<b;++i)cout<<a[i]<<" ";
#define val(ar,b) ar[b]=a[i];b++;
int main(){
   int n;
   cout << "Enter count of integers: ";
   cin >> n;
   int a[n],pos[n], neg[n], odd[n], even[n], pc=0, nc=0, oc=0, ec=0;
   cout<< "Enter the integers: \n";
   for(int i=0;i<n;++i){
      cin >> a[i];
      if(a[i] >= 0){
         val(pos,pc)
      }
      else {
         val(neg, nc)
      }
      if(a[i]%2) {
         val(odd,oc)
      }
      else {
         val(even,ec)}}
   cout << "Positive numbers are: \n";
   loop(pos, pc);
   cout << "\nNegative numbers are: \n";
   loop(neg, nc);
```

```
    cout << "\nEven numbers are: \n";
    loop(even,ec);
    cout << "\nOdd numbers are: \n";
    loop(odd, oc);
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 4\PPL Program #3.exe
Enter count of integers: 5
Enter the integers:
-1 2 1 -4 3
Positive numbers are:
2 1 3
Negative numbers are:
-1 -4
Even numbers are:
2 -4
Odd numbers are:
-1 1 3
--------------------------------
Process exited after 13.13 seconds with return value 0
Press any key to continue . . .
```

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NAME OF PROGRAM-4: WRITE A C PROGRAM TO MERGE TWO SORTED ARRAYS INTO ANOTHER ARRAY IN A SORTED ORDER.

SOURCE CODE:

```
#include <iostream>
using namespace std;
#define in(ar, s) for(int i=0; i<s; ++i) cin >> ar[i]
int main(){
   int n1,n2;
   cout << "Enter size of Array 1: ";
   cin >> n1;
   cout << "Enter size of Array 2: ";
   cin >> n2;
   int a[n1], b[n2], c[n1+n2];
   cout << "Enter elements of Array 1 in sorted order: ";
   in(a,n1);
   cout << "Enter elements of Array 2 in sorted order: ";
   in(b,n2);
   int ai=0,bi=0,ci=0;
   while(ci<n1+n2){
      if(ai<n1 && bi <n2) {
         if(a[ai] <b[bi]){
            c[ci]= a[ai];
            ai++;}
         else {
            c[ci] = b[bi];
            bi++;}}
      else if(ai==n1){
         c[ci]=b[bi];
         bi++;}
      else {
```

```
            c[ci]= a[ai];
            ai++;
        }
        ci++;
    }
    cout << "Merged Array in sorted form is: \n";
    for(int i=0; i<ci; ++i) cout << c[i] << " ";
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 4\PPL Program #4.exe
Enter size of Array 1: 4
Enter size of Array 2: 3
Enter elements of Array 1 in sorted order: 1 7 9 13
Enter elements of Array 2 in sorted order: 2 6 15
Merged Array in sorted form is:
1 2 6 7 9 13 15
--------------------------------
Process exited after 10.56 seconds with return value 0
Press any key to continue . . .
```

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NAME OF PROGRAM-5: WRITE A C PROGRAM TO FIND THE FREQUENCY OF A PARTICULAR NUMBER IN A LIST OF INTEGERS.

SOURCE CODE:

```
#  #include <iostream>
using namespace std;
#define in(ar, s) for(int i=0; i<s; ++i) cin >> ar[i]
int main(){
   int n, num, freq=0;
   cout << "Enter size of Array: ";
   cin >> n;
   int a[n];
   cout << "Enter elements of array: ";
   in(a,n);
   cout << "Enter number to search: ";
   cin >> num;
   for(int i=0; i<n;++i){
      if(a[i]==num) freq++;
   }
   cout << "Number " << num << " appeared " << freq << " times!";
}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 4\PPL Program #5.exe
Enter size of Array: 5
Enter elements of array: 1 2 4 4 5
Enter number to search: 4
Number 4 appeared 2 times!
--------------------------------
Process exited after 16.19 seconds with return value 0
Press any key to continue . . .
```

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Signature of student:	Signature of Faculty:	

NAME OF PROGRAM-1: WRITE A C PROGRAM THAT USES FUNCTIONS TO PERFORM THE FOLLOWING OPERATIONS:

iii. TO INSERT A SUB STRING INTO A GIVEN MAIN STRING FROM A GIVEN POSITION.
iv. TO DELETE N CHARACTERS FROM A GIVEN POSITION IN A GIVEN STRING.

SOURCE CODE:

```
#include <iostream>
using namespace std;
#define a(x,y) a.substr(x, y)
int main(){
   string a, b, c;
   cout << "Enter the string: ";
   cin >> a;
   char ch;
   cout << "+ to add n characters\n- to delete n characters\n";
   cin >> ch;
   int n;
   cout << "Give position: ";
   cin >> n;
   switch(ch){
      case '+':
         cout << "Enter the string: ";
         cin >> b;
         c = a(0,n-1) + b + a(n,a.size()-1);
         break;
      case '-':
         c = a(n, a.size()-1);
   }
       cout << c;}
```

OUTPUT SCREEN:

```
D:\Shachita\PPL\Week 5\PPL Program #1.exe
Enter the string: qazwsx
+ to add n characters
- to delete n characters
-
Give position: 3
wsx
--------------------------------
Process exited after 11.21 seconds with return value 0
Press any key to continue . . .
```

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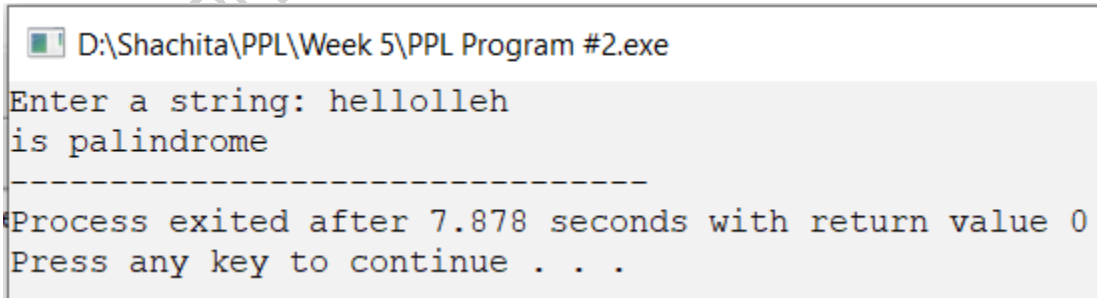
NAME OF PROGRAM-2: WRITE A C PROGRAM TO DETERMINE IF THE GIVEN STRING IS A PALINDROME OR NOT.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main(){
   string a;
   int i(0);
   cout << "Enter a string: ";
   cin >> a;
   int size = a.size();
   for(; i<size/2; ++i) if(a[i] != a[size-i-1]) break;
   if(i == size/2) cout << "is palindrome";
   else cout << "not palindrome";
}
```

OUTPUT SCREEN



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NAME OF PROGRAM-3: WRITE A C PROGRAM TO FIND A STRING WITHIN A SENTENCE AND REPLACE IT WITH ANOTHER STRING.

SOURCE CODE:

```
#include <iostream>
using namespace std;
#define input(a) getline(cin,a)
int main(){
   string a,b,c, d;
   cout << "Enter a string: ";
   input(a);
   cout << "String to find: ";
   input(b);
   cout << "String to replace with:";
   input(c);
   int sidx = a.find(b);
   int eidx = sidx + b.size();
   d = a.substr(0, sidx) + c + a.substr(eidx, a.size()-1);
   cout << d;
}
```

OUTPUT SCREEN

```
D:\Shachita\PPL\Week 5\PPL Program #3.exe
Enter a string: awesome
String to find: some
String to replace with:ful
aweful
--------------------------------
Process exited after 15.82 seconds with return value 0
Press any key to continue . . .
```

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NAME OF PROGRAM-5: WRITE A C PROGRAM TO THAT READS A LINE OF TEXT AND COUNTS ALL OCCURRENCE OF A PARTICULAR WORD.

SOURCE CODE:

```
#include <iostream>
using namespace std;
int main() {
   int res=0, N, M; string str, word;
   cout << "Enter a string: ";
   getline(cin, str);
   cout << "Enter a word: ";
   cin >> word;
   N= str.length(); M= word.length();
   for (int i = 0; i <= N - M; i++)  {
      int j;
      for (j = 0; j < M; j++)
         if (str[i+j] != word[j])
            break;
      if (j == M) {
        res++;
        j = 0;
      }
   }
   cout << word << " occurs " << res << " times!";
}
```

OUTPUT SCREEN