

**PRACTICAL JOURNAL OF PRINCIPLES OF PROGRAMMING LANGUAGES**

**(CS-6002)**

**BE: Third-Year**

Department of Computer Science & Engineering

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| **Branch & Section** | **:** | CS-D |
| **Roll Number** | **:** | 0827CS161200 |
| **Year** | **:** | 2018-19 |

**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.**/Ms. Sarthak BhaijiBE **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**

1. Write a C program to check whether a number is even or odd using ternary operator.
2. Write a C program to perform the addition of two numbers without using + operator.
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.
4. Write a C program to find the sum of individual digits of a 3 digit number.
5. Write a C program to read the values of x and y and print the results of the following expressions in one line:
6. (x + y) / (x - y)
7. (x + y)(x - y)

**Week-2 CONTROL STRUCTURES**

1. Write a C program to find the sum of individual digits of a positive integer.
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.
3. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
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 |

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.

**Week-3** **CONTROL STRUCTURES**

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 C program to calculate the following sum:

sum = 1 – x2 /2! + x4 /4! – x6 /6! +x8 /8! – x10/10!

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

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| **Week-4** | **ARRAYS** | |
| Write a C program to find the second largest integer in a list of integers. | |
| Write a C program to perform the following: | |
| 1. Addition of two matrices | |
| 2. Multiplication of two matrices | |
| Write a C program to count and display positive, negative, odd and even numbers in an array. | |
| Write a C program to merge two sorted arrays into another array in a sorted order. | |
| Write a C program to find the frequency of a particular number in a list of integers. | |
| **Week-5 STRINGS** | | |
| Write a C program that uses functions to perform the following operations: | |
| To insert a sub string into a given main string from a given position. | |
| To delete n characters from a given position in a given string. | |
| Write a C program to determine if the given string is a palindrome or not. | |
| Write a C program to find a string within a sentence and replace it with another string. | |
| Write a C program that reads a line of text and counts all occurrence of a particular word. | |
| 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.  **Week-6** **FUNCTIONS**   1. Write C programs that use both recursive and non-recursive functions    1. To find the factorial of a given integer.    2. To find the greatest common divisor of two given integers. 2. Write C programs that use both recursive and non-recursive functions    1. To print Fibonacci series.    2. To solve towers of Hanoi problem. 3. Write a C program to print the transpose of a given matrix using function. 4. Write a C program that uses a function to reverse a given string.   **Week-7** **POINTERS**   1. Write a C program to concatenate two strings using pointers. 2. Write a C program to find the length of string using pointers. 3. Write a C program to compare two strings using pointers. 4. Write a C program to copy a string from source to destination using pointers. 5. Write a C program to reverse a string using pointers.   **Week-8** **STRUCTURES AND UNIONS**   1. Write a C program that uses functions to perform the following operations:    1. Reading a complex number    2. Writing a complex number    3. Addition and subtraction of two complex numbers    4. Multiplication of two complex numbers. Note: represent complex number using a structure. 2. Write a C program to compute the monthly pay of 100 employees using each employee’s name, basic pay. The DA is computed as 52% of the basic pay. Gross-salary (basic pay + DA). Print the employees name and gross salary. 3. Create a Book structure containing book\_id, title, author name and price. Write a C program to pass a structure as a function argument and print the book details. 4. Create a union containing 6 strings: name, home\_address, hostel\_address, city, state and zip. Write a C program to display your present address. 5. Write a C program to define a structure named DOB, which contains name, day, month and year. Using the concept of nested structures display your name and date of birth. | |

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| **Date of Experiment:** | **Date of Submission:** | | **Submitted on:** |
| **Remarks by faculty:** | | | **Grade:** |
| **Signature of student:** | | **Signature of Faculty:** | |

**Week-1** **OPERATORS AND EVALUATION OF EXPRESSIONS**

**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 n;

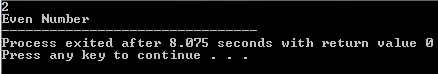
cin>>n;

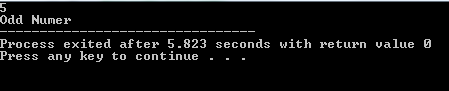
(n%2==0)?cout<<"Even Number":cout<<"Odd Numer";

return 0;

}

**Output Screen:**

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| --- | --- | --- | --- |
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**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=5,b=10;

cout<<"sum = "<<(a-(-b));

return 0;

}

**Output:-**

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| --- | --- | --- | --- |
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**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,A;

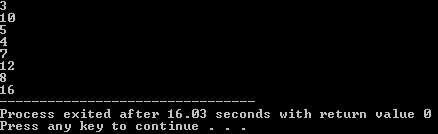
cin>>a>>b>>c>>d>>e>>f>>g;

A=((a + b / c \* d - e) \* (f - g));

cout<<A;

}

**OUTPUT:-**

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| --- | --- | --- | --- |
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**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 num,sum=0;

cin>>num;

while(num!=0)

{

sum=sum+(num%10);

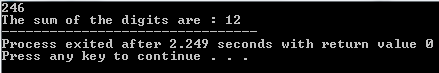
num=num/10;

}

cout<<"The sum of the digits are : "<<sum;

}

**OUTPUT:-**

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| --- | --- | --- | --- |
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**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()

{

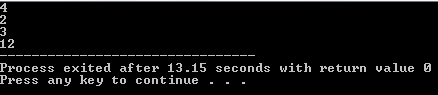
int x,y;

cin>>x>>y;

cout<<(x+y)/(x-y)<<endl<<(x+y)\*(x-y);

}

**OUTPUT:-**

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**Week-2 CONTROL STRUCTURES**

**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 val, num, sum = 0,arr[20];

cin >> val;

num = val;

while (num != 0)

{

sum = sum + num % 10;

num = num / 10;

}

cout<<sum<<endl;

sum=0;

return 0;

}

|  |  |  |  |
| --- | --- | --- | --- |
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**Output:-**

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**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,c;

cin>>n;

cout<<a<<" "<<b<<" ";

for(int i=0;i<n-2;i++)

{

c=a+b;

a=b;

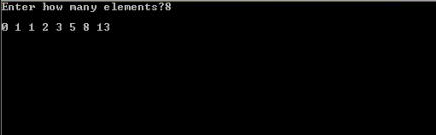
b=c;

cout<<c<<" ";

}

}

**Output:-**



|  |  |  |  |
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**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;

cin>>n;

int j,count;

for(int i=1;i<=n;i++)

{

count=0;

for(j=2;j<=i/2;j++)

{

if(i%j==0)

{

count++;

break;

}

}

if(count==0 && i!=1)

cout<<i<<endl;

}

return 0;

}

**Output:-**

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|  |  |  |  |
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**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()

{

char X;

cin>>X;

if(int(X)>64 && int(X)<91)

cout<<"Captital letter";

else if(int(X)>96 && int(X)<123)

cout<<"Small letter";

else if(int(X)>47 && int(X)<58)

cout<<"Digit";

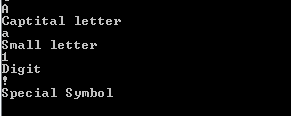
else

cout<<"Special Symbol";

return 0;

}

**OUTPUT:-**



|  |  |  |  |
| --- | --- | --- | --- |
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**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,total,loss,profit;

cin>>cp>>sp;

if(cp>sp)

{

cout<<"Loss"<<endl;

total=cp-sp;

loss=(total\*100)/cp;

cout<<"The loss percentage is "<<loss;

}

else

{cout<<"Profit"<<endl;

total=sp-cp;

profit=(total\*100)/cp;

cout<<"The profit percentage is "<<profit;

}

return 0;

}

**OUTPUT:-**

