**PPS File**

**By Harshbir Singh (ECE A2)**

**Operators in C++**

1. **Arithmetic Operators:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**float a=40,b=50;**

**int c=40,d=50;**

**cout << "a+b = " << a+b << endl;**

**cout << "a-b = " << a-b << endl;**

**cout << "a\*b = " << a\*b << endl;**

**cout << "a/b = " << a/b << endl;**

**cout << "c % d = " << c%d << endl;**

**return 0;**

**}**

**Output:**

**a+b = 90**

**a-b = -10**

**a\*b = 2000**

**a/b = 0.8**

**c % d = 40**

1. **Relational Operator:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a=40,b=50;**

**cout << "(a > b): " << (a > b) << endl;**

**cout << "(a < b): " << (a < b) << endl;**

**cout << "(a <= b): " << (a <= b) << endl;**

**cout << "(a >= b): " << (a >= b) << endl;**

**cout << "(a == b): " << (a == b) << endl;**

**cout << "(a != b): " << (a != b) << endl;**

**return 0;**

**}**

**Output:**

**(a > b): 0**

**(a < b): 1**

**(a <= b): 1**

**(a >= b): 0**

**(a == b): 0**

**(a != b): 1**

1. **Logical Operator:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a=40,b=55;**

**if ((a > b) && (b = 50))**

**{**

**cout << "Hello" << endl;**

**}**

**if ((a == 40) || (a < b))**

**{**

**cout << "World!" << endl;**

**}**

**if (!(a > b))**

**{**

**cout << "a is less than b" << endl;**

**}**

**return 0;**

**}**

**Output:**

**World!**

**a is less than b**

1. **Assignment Operators:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a =6 ,b = 10;**

**cout << "a = " << a << endl;**

**cout << "a += b = " << (a += b) << endl;**

**cout << "a -= b = " << (a -= b) << endl;**

**cout << "a \*= b = " << (a \*= b) << endl;**

**cout << "a /= b = " << (a /= b) << endl;**

**return 0;**

**}**

**Output:**

**a = 6**

**a += b = 16**

**a -= b = 6**

**a \*= b = 60**

**a /= b = 6**

1. **Ternary or Conditional Operators:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a = 10, b = 60;**

**int result = (a < b) ? b : a;**

**cout << "The greatest number is: " << result << endl;**

**return 0;**

**}**

**Output:**

**The greatest number is: 60**

**Practice Questions**

1. **Write a program to check wheter the alphabet is a consonant or a vowel.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**char ch;**

**cout << "Enter a letter: ";**

**cin >> ch;**

**((ch == 'a') || (ch == 'o') || (ch == 'u') || (ch == 'e') || (ch == 'i'))**

**? cout << ch << " is a vowel!" << endl : cout << ch << " is a consonant!";**

**return 0;**

**}**

**Output:**

**Enter a letter: b**

**b is a consonant!**

1. **Write a program to swap two numbers using a third variable.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a = 4,b=5,c;**

**cout << "Before swaping:" << endl;**

**cout << "a = " << a << endl;**

**cout << "b = " << b << endl;**

**c = a;**

**a = b;**

**b = c;**

**cout << "After swaping:" << endl;**

**cout << "a = " << a << endl;**

**cout << "b = " << b << endl;**

**return 0;**

**}**

**Output:**

**Before swaping:**

**a = 4**

**b = 5**

**After swaping:**

**a = 5**

**b = 4**

1. **Write a program to enter students record of result in subjects (i.e. Maths, Sci, Punjabi, English). Find the percentage of student.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**float maths,eng,sci,pun;**

**cout << "Enter the marks in Maths(out of 100): ";**

**cin >> maths;**

**cout << "Enter the marks in English(out of 100): ";**

**cin >> eng;**

**cout << "Enter the marks in Punjabi(out of 100): ";**

**cin >> pun;**

**cout << "Enter the marks in Sci(out of 100): ";**

**cin >> sci;**

**float percent;**

**percent = ((maths+sci+eng+pun)/400)\*100;**

**cout << "Percentage of student is: " << percent << endl;**

**return 0;**

**}**

**Output:**

**Enter the marks in Maths(out of 100): 90**

**Enter the marks in English(out of 100): 90**

**Enter the marks in Punjabi(out of 100): 90**

**Enter the marks in Sci(out of 100): 90**

**Percentage of student is: 90**

1. **Write a program to find greater of two numbers using operators.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a = 45, b = 50;**

**((a > b)) ? cout << "a is greater than b" : cout << "a is smaller than b";**

**return 0;**

**}**

**Output:**

**a is smaller than b**

1. **Write a program to find greater of three numbers.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a = 45, b = 50 , c = 100;**

**((a > b) && (a > c))**

**? cout << "a is greater" : ((b > a) && (b > c))**

**? cout << "b is greater" : ((c > a) && (c > b))**

**? cout << "c is greater" : cout << "none of them is greater.";**

**return 0;**

**}**

**Output:**

**c is greater**

1. **Write a program to find area, perimeter of a rectangle and area, circumference of a circle.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int l = 100, b = 23, r = 34;**

**cout << "Area of rectangle = " << (l\*b) << " sq. cm" << endl;**

**cout << "Perimeter of rectangle = " << (2\*(l+b)) << " cm" << endl;**

**cout << "Area of circle = " << (3.14\*r\*r) << " sq. cm" << endl;**

**cout << "Circumference of circle = " << (2\*3.14\*r) << " cm" << endl;**

**return 0;**

**}**

**Output:**

**Area of rectangle = 2300 sq. cm**

**Perimeter of rectangle = 246 cm**

**Area of circle = 3629.84 sq. cm**

**Circumference of circle = 213.52 cm**

**Practice Questions**

**(conditional, switch-case and looping statements)**

1. **Write a program to check that a number is even using if statement.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**if ((num % 2) == 0)**

**{**

**cout << "It is even!" << endl;**

**}**

**return 0;**

**}**

**Output:**

**Enter a number: 6**

**It is even!**

1. **Write a program to check number is even or odd using if-else statement.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**if ((num % 2) == 0)**

**{**

**cout << "It is even!" << endl;**

**}**

**else{**

**cout << "It is odd!" << endl;**

**}**

**return 0;**

**}**

**Output 1:**

**Enter a number: 5**

**It is odd!**

**Output 2:**

**Enter a number: 6**

**It is even!**

1. **Write a program to check number is even or odd or zero using nested if statement.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**if (num != 0)**

**{**

**if ((num % 2) == 0)**

**{**

**cout << "It is even!" << endl;**

**}**

**else{**

**cout << "It is odd!" << endl;**

**}**

**}**

**else{**

**cout << "It is zero" << endl;**

**}**

**return 0;**

**}**

**Output 1:**

**Enter a number: 5**

**It is odd!**

**Output 2:**

**Enter a number: 6**

**It is even!**

**Output 3:**

**Enter a number: 0**

**It is zero**

1. **Write a program to find greater of three numbers using if-else ladder.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int a=50,b=40,c=340;**

**if ((a > b) && (a > c))**

**{**

**cout << "a is greater" << endl;**

**}**

**else if ((b > a) && (b > c)){**

**cout << "b is greater" << endl;**

**}**

**else{**

**cout << "c is greater" << endl;**

**}**

**return 0;**

**}**

**Output:**

**c is greater**

1. **Write a program to check prime number using if-else statement.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**if ((num < 2))**

**{**

**cout << "It is not a prime number." << endl;**

**}**

**else if ((num == 2) || (num == 3) || (num == 5))**

**{**

**cout << "It is a prime" << endl;**

**}**

**else**

**{**

**for (int i=2; i <= num\*num; i++)**

**{**

**if ( num % i == 0 ){**

**cout << "It is not a prime number" << endl;**

**break;**

**}**

**else**

**{**

**cout << "It is a prime number" << endl;**

**break;**

**}**

**}**

**}**

**return 0;**

**}**

**Output 1:**

**Enter a number: 2**

**It is a prime**

**Output 2:**

**Enter a number: 346**

**It is not a prime number**

1. **Write a program to check that a numbers is zero or positive or negative using nested if statement.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**if (num != 0)**

**{**

**if (num < 0)**

**{**

**cout << "It is a negative number" << endl;**

**}**

**else{**

**cout << "It is a positive number" << endl;**

**}**

**}**

**else{**

**cout << "It is zero" << endl;**

**}**

**return 0;**

**}**

**Output 1:**

**Enter a number: -2**

**It is a negative number**

**Output 2:**

**Enter a number: 8**

**It is a positive number**

**Output 3:**

**Enter a number: 0**

**It is zero**

1. **Write a program to check months of year using switch-case statements.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**switch (num)**

**{**

**case 1:**

**cout << "January" << endl;**

**break;**

**case 2:**

**cout << "February" << endl;**

**break;**

**case 3:**

**cout << "March" << endl;**

**break;**

**case 4:**

**cout << "April" << endl;**

**break;**

**case 5:**

**cout << "May" << endl;**

**break;**

**case 6:**

**cout << "June" << endl;**

**break;**

**case 7:**

**cout << "July" << endl;**

**break;**

**case 8:**

**cout << "August" << endl;**

**break;**

**case 9:**

**cout << "September" << endl;**

**break;**

**case 10:**

**cout << "October" << endl;**

**break;**

**case 11:**

**cout << "November" << endl;**

**break;**

**case 12:**

**cout << "December" << endl;**

**break;**

**default:**

**cout << "Invalid!" << endl;**

**break;**

**}**

**}**

**Output:**

**Enter a number: 8**

**August**

1. **Write a program to check that a year is a leap year.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a year: ";**

**cin >> num;**

**if ((num % 4) == 0)**

**{**

**cout << "It is a leap year" << endl;**

**}**

**else**

**{**

**cout << "It is not a leap year" << endl;**

**}**

**return 0;**

**}**

**Output:**

**Enter a year: 2024**

**It is a leap year**

1. **Write a program to print numbers from one to ten using for loop.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**for (int i = 1; i <= 10; i++)**

**{**

**cout << i << " ";**

**}**

**return 0;**

**}**

**Output:**

**1 2 3 4 5 6 7 8 9 10**

1. **Write a program to print first ten even numbers using for loop.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**for (int i = 0; i <= 20; i++)**

**{**

**cout << i << " ";**

**++i;**

**}**

**return 0;**

**}**

**Output:**

**0 2 4 6 8 10 12 14 16 18 20**

1. **Write a program print values from one to ten in reverse order using for loop.**

**Code:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**for (int i = 10; i >= 1; i--)**

**{**

**cout << i << " ";**

**}**

**return 0;**

**}**

**Output:**

**10 9 8 7 6 5 4 3 2 1**

1. **Write a program to print first ten numbers using while loop and do-while loop.**

**Code 1:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num = 1;**

**while (num <= 10)**

**{**

**cout << num << " ";**

**num++;**

**}**

**}**

**Output 1:**

**1 2 3 4 5 6 7 8 9 10**

**Code 2:**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num = 1;**

**do**

**{**

**cout << num << " ";**

**num++;**

**} while (num <= 10);**

**return 0;**

**}**

**Output 2:**

1. **2 3 4 5 6 7 8 9 10**

**Questions**

1. **Ramesh’s basic salary is input through keyboard and house rent allowance is 20% of basic salary. Write a program to find gross salary. (Gross Sal = Basic Sal + DA + MRA+HRA)**

**#include <iostream>**

**using namespace std;**

**int main(){**

**float basic,hra,da,mra,gross;**

**cout << "Enter salary: ";**

**cin >> basic;**

**hra = 0.20 \* basic;**

**da = 0.40 \* basic;**

**mra = 0.15\*basic;**

**gross = basic + da + hra + mra;**

**cout << "Gross salary: " << gross;**

**return 0;**

**}**

**Output:**

**Enter salary: 50000**

**Gross salary: 87500**

1. **Temperature of city is in Fo is input and write a program to convert the temperature to Co.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**float temp,ctemp;**

**cout << "Enter the temperature in F: ";**

**cin >> temp;**

**ctemp = (temp-32)\*(5/9);**

**cout << "Temperature in C: " << ctemp << endl;**

**return 0;}**

**Output:**

**Enter the temperature in F: 489**

**Temperature in C: 0**

1. **If five digit number is input through keyboard, write a program to calculate the sum of its digits.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int sum=0,num,m,n;**

**cout << "Enter a five digit number: ";**

**cin >> num;**

**n = num;**

**while (n > 0)**

**{**

**m = n%10;**

**sum += m;**

**n /= 10;**

**}**

**cout << "The sum of five digits is: " << sum << endl;**

**return 0;**

**}**

**Output:**

**Enter a five digit number: 45693**

**The sum of five digits is: 27**

1. **A cashier has currency notes of denomination of (10,50 and 100)** **if amount to be withdrawn is input through keyboard fin the each dinomination the cashier has to give.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int n100,n50,n10;**

**int amount;**

**cout << "Enter the amount to be withdrawn: ";**

**cin >> amount;**

**n100 = amount / 100;**

**amount = amount % 100;**

**n50 = amount / 50;**

**amount = amount % 50;**

**n10 = amount / 10;**

**amount = amount % 10;**

**cout << "Currency notes given: " << endl;**

**cout << "No. of 100 notes: " << n100 << endl;**

**cout << "No. of 50 notes: " << n50 << endl;**

**cout << "No. of 10 notes: " << n10 << endl;**

**if (amount != 0){**

**cout << "Amount that can not be dinominated is: " << amount<< endl;**

**}**

**return 0;**

**}**

**Output:**

**Enter the amount to be withdrawn: 895**

**Currency notes given:**

**No. of 100 notes: 8**

**No. of 50 notes: 1**

**No. of 10 notes: 4**

**Amount that can not be dinominated is: 5**

1. **Find the absolute value of a number entered through keyboard.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int num;**

**cout << "Enter a number: ";**

**cin >> num;**

**if (num < 0)**

**{**

**num = -num;**

**}**

**cout << "Absolte value of number is: " << num;**

**return 0;**

**}**

**Output:**

**Enter a number: -9**

**Absolte value of number is: 9**

1. **If the Cost Price and Selling Price of an item is entered, write a program to determine wheter the seller has made profit or loss and how much.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int cp,sp;**

**cout << "Enter the cost price of the item: ";**

**cin >> cp;**

**cout << "Enter the selling price of the item: ";**

**cin >> sp;**

**if (sp < cp)**

**{**

**cout << "Loss of: ";**

**cout << cp-sp;**

**}**

**else{**

**cout << "Profit of: ";**

**cout << sp-cp;**

**}**

**return 0;**

**}**

**Output:**

**Enter the cost price of the item: 80**

**Enter the selling price of the item: 90**

**Profit of: 10**

1. **Three angles of a triangle are entered , write a program to check whether the triangle is valid or not.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**float a1,a2,a3;**

**cout << "Enter the first angle of triangle: ";**

**cin >> a1;**

**cout << "Enter the second angle of triangle: ";**

**cin >> a2;**

**cout << "Enter the third angle of triangle: ";**

**cin >> a3;**

**float sum = a1+a2+a3;**

**if (sum == 180)**

**{**

**cout << "It is a valid triangle!" << endl;**

**}**

**else{**

**cout << "It is not a valid triangle" << endl;**

**}**

**return 0;**

**}**

**Output:**

**Enter the first angle of triangle: 30**

**Enter the second angle of triangle: 60**

**Enter the third angle of triangle: 90**

**It is a valid triangle!**

1. **A library charges per day fine for a book, for first five days fine is 50 paisa, for 6 – 10 it is ₹ 1 per day and above 10 days it is ₹ 5 per day. If you return a book after 30 days your membership is cancelled. Write a program that a member is late to return the book and display fine and message.**

**Arrays**

1. **Write a program to find maximum value in an array.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int arr[5];**

**for (int i = 0; i < 5; i++)**

**{**

**cout << "Enter a value: ";**

**cin >> arr[i];**

**}**

**int max = arr[0];**

**for (int i = 0; i < 5; i++)**

**{**

**if (max < arr[i]){**

**max = arr[i];**

**}**

**if (min > arr[i]){**

**min = arr[i];**

**}**

**}**

**cout << "Maximum value in array is: " << max << endl;**

**return 0;**

**}**

**Output:**

**Enter a value: 56**

**Enter a value: 23**

**Enter a value: 85**

**Enter a value: 4**

**Enter a value: 25**

**Maximum value in array is: 85**

**Minimum value in array is: 4**

1. **Write a program to print composite numbers using arrays, where numbers can be up to 50.**

**#include <iostream>**

**using namespace std;**

**bool isComposite(int n){**

**if (n <= 1){**

**return false;**

**}**

**if (n <= 3){**

**return false;**

**}**

**if (n % 2 == 0 || n % 3 == 0)**

**{**

**return true;**

**}**

**for (int i = 5; i \* i < n; i = i + 6)**

**{**

**if (n % i == 0 || n % (i+2) == 0)**

**{**

**return true;**

**}**

**}**

**return false;**

**}**

**int main(){**

**int arr[50];**

**for (int i = 0; i < 50; i++)**

**{**

**arr[i] = i + 1;**

**}**

**for (int i=0; i < 50; i++){**

**if (isComposite(arr[i]))**

**{**

**cout << arr[i] << " is a compsite number" << endl;**

**}**

**}**

**return 0;**

**}**

**Output:**

**4 is a compsite number**

**6 is a compsite number**

**8 is a compsite number**

**9 is a compsite number**

**10 is a compsite number**

**12 is a compsite number**

**14 is a compsite number**

**15 is a compsite number**

**16 is a compsite number**

**18 is a compsite number**

**20 is a compsite number**

**21 is a compsite number**

**22 is a compsite number**

**24 is a compsite number**

**26 is a compsite number**

**27 is a compsite number**

**28 is a compsite number**

**30 is a compsite number**

**32 is a compsite number**

**33 is a compsite number**

**34 is a compsite number**

**34 is a compsite number**

**35 is a compsite number**

**36 is a compsite number**

**38 is a compsite number**

**39 is a compsite number**

**40 is a compsite number**

**42 is a compsite number**

**44 is a compsite number**

**45 is a compsite number**

**46 is a compsite number**

**48 is a compsite number**

**49 is a compsite number**

**50 is a compsite number**

1. **Write a program to traverse a 2D array.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int arr[3][3];**

**for (int i = 1; i <= 3; i++)**

**{**

**for (int j = 1; j <= 3; j++)**

**{**

**cout << "Enter the value at " << i << "," << j << endl;**

**cin >> arr[i][j];**

**}**

**}**

**for (int i = 1; i <= 3; i++)**

**{**

**for (int j = 1; j <= 3; j++)**

**{**

**cout << "Value at " << i << "," << j << " is " << arr[i][j] << endl;**

**}**

**}**

**return 0;**

**}**

**Output:  
Enter the value at 1,1**

**5**

**Enter the value at 1,2**

**9**

**Enter the value at 1,3**

**4**

**Enter the value at 2,1**

**2**

**Enter the value at 2,2**

**6**

**Enter the value at 2,3**

**5**

**Enter the value at 3,1**

**4**

**Enter the value at 3,2**

**56**

**Enter the value at 3,3**

**2**

**Value at 1,1 is 5**

**Value at 1,2 is 9**

**Value at 1,3 is 4**

**Value at 2,1 is 2**

**Value at 2,2 is 6**

**Value at 2,3 is 5**

**Value at 3,1 is 4**

**Value at 3,2 is 56**

**Value at 3,3 is 3**

1. **Write a program to print a matrix of four rows and three columns.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int arr[4][3] = {{2,5,6},**

**{3,5,7},**

**{6,7,1},**

**{2,6,9}};**

**for (int i = 1; i < 5; i++)**

**{**

**for (int j = 1; j < 4; j++)**

**{**

**cout << "Value at " << i << "," << j << " is " << arr[i][j] << endl;**

**}**

**}**

**return 0;**

**}**

**Output:**

**Value at 1,1 is 5**

**Value at 1,2 is 7**

**Value at 1,3 is 6**

**Value at 2,1 is 7**

**Value at 2,2 is 1**

**Value at 2,3 is 2**

**Value at 3,1 is 6**

**Value at 3,2 is 9**

**Value at 3,3 is 33**

**Value at 4,1 is 0**

**Value at 4,2 is 2**

**Value at 4,3 is 4**

1. **25 numbers are entered through keyboard into an array how many are positive, negative, even, odd.**

**#include <iostream>**

**using namespace std;**

**bool checkEvenOdd(int n){**

**if (n % 2 == 0)**

**{**

**return true;**

**}**

**return false;**

**}**

**int main(){**

**int arr[25];**

**int pos=0,neg=0,even=0,odd=0;**

**for (int i = 1; i < 26; i++)**

**{**

**cout <<"Enter value " << i << ": ";**

**cin >> arr[i];**

**}**

**for (int i = 1; i < 26; i++)**

**{**

**if (arr[i] > 0)**

**{**

**pos += 1;**

**if (checkEvenOdd(arr[i]))**

**{**

**even += 1;**

**}**

**else{**

**odd += 1;**

**}**

**}**

**else if (arr[i] < 0)**

**{**

**neg += 1;**

**if (checkEvenOdd(arr[i]))**

**{**

**even += 1;**

**}**

**else{**

**odd += 1;**

**}**

**}**

**}**

**cout << "Positive: " << pos << endl;**

**cout << "Negative: " << neg << endl;**

**cout << "Even: " << even << endl;**

**cout << "Odd: " << odd << endl;**

**return 0;**

**}**

**Output:**

**Enter value 1: 865**

**Enter value 2: -968**

**Enter value 3: -659**

**Enter value 4: 5624**

**Enter value 5: 128**

**Enter value 6: 36**

**Enter value 7: 42**

**Enter value 8: 75**

**Enter value 9: 95**

**Enter value 10: 82**

**Enter value 11: 42**

**Enter value 12: -9**

**Enter value 13: -854**

**Enter value 14: 973**

**Enter value 15: -685**

**Enter value 16: -346**

**Enter value 17: -9**

**Enter value 18: 756**

**Enter value 19: 69**

**Enter value 20: 98**

**Enter value 21: 92**

**Enter value 22: 34**

**Enter value 23: -87**

**Enter value 24: -65**

**Enter value 25: -6**

**Positive: 15**

**Negative: 10**

**Even: 14**

**Odd: 11**

1. **Write a program for addition and multiplication of two matrices.**

**#include <iostream>**

**using namespace std;**

**int main(){**

**int m[3][3] = {{1,4,3},{5,8,9},{3,7,4}};**

**int n[3][3] = {{5,2,1},{4,8,5},{5,7,8}};**

**int add[3][3], mul[3][3];**

**// adding**

**for (int i = 0; i < 3; i++)**

**{**

**for (int j = 0; j < 3; j++)**

**{**

**add[i][j] = m[i][j] + n[i][j];**

**}**

**}**

**// multiplication**

**for (int i = 0; i < 3; i++) {**

**for (int j = 0; j < 3; j++) {**

**mul[i][j] = 0; // initialize**

**for (int k = 0; k < 3; k++) {**

**mul[i][j] += m[i][k] \* n[k][j];**

**}**

**}**

**}**

**// traversing**

**for (int i = 0; i < 3; i++)**

**{**

**for (int j = 0; j < 3; j++)**

**{**

**cout << "Add matrix value at " << i << "," << j << " is " << add[i][j] << endl;**

**}**

**}**

**cout << "\n";**

**for (int i = 0; i < 3; i++)**

**{**

**for (int j = 0; j < 3; j++)**

**{**

**cout << "Mul matrix value at " << i << "," << j << " is " << mul[i][j] << endl;**

**}**

**}**

**return 0;**

**}**

**Output:  
Add matrix value at 0,0 is 6**

**Add matrix value at 0,1 is 6**

**Add matrix value at 0,2 is 4**

**Add matrix value at 1,0 is 9**

**Add matrix value at 1,1 is 16**

**Add matrix value at 1,2 is 14**

**Add matrix value at 2,0 is 8**

**Add matrix value at 2,1 is 14**

**Add matrix value at 2,2 is 12**

**Mul matrix value at 0,0 is 36**

**Mul matrix value at 0,1 is 55**

**Mul matrix value at 0,2 is 45**

**Mul matrix value at 1,0 is 102**

**Mul matrix value at 1,1 is 137**

**Mul matrix value at 1,2 is 117**

**Mul matrix value at 2,0 is 63**

**Mul matrix value at 2,1 is 90**

**Mul matrix value at 2,2 is 70**

**Functions**

1. **Create a function named Power with parameters a,b to calculate the value of ab.**

**#include <iostream>**

**using namespace std;**

**int power(int a, int b){**

**int num=1;**

**for (int i = 0; i < b; i++)**

**{**

**num \*= a;**

**}**

**return num;**

**}**

**int main(){**

**cout << power(2,3);**

**return 0;**

**}**

**Output:**

**8**

1. **Create a function that receives marks obtained by students in three subjects find the average and percentage. Cell this function in main and print the result in main.**

**#include <iostream>**

**using namespace std;**

**void marks(float sub1, float sub2, float sub3, float max\_marks){**

**float total = 3\*max\_marks;**

**float tot = sub1+sub2+sub3;**

**double avg = tot/3;**

**double percentage = (tot/total)\*100;**

**cout << "Average: " << avg << endl;**

**cout << "Percentage: " << percentage << endl;**

**}**

**int main(){**

**float x,y,z,m;**

**cout << "Enter the maximum marks of each subject: ";**

**cin >> m;**

**cout << "Enter the marks in first subject: ";**

**cin >> x;**

**cout << "Enter the marks in second subject: ";**

**cin >> y;**

**cout << "Enter the marks in third subject: ";**

**cin >> z;**

**marks(x,y,z,m);**

**return 0;**

**}**

**Output:**

**Enter the maximum marks of each subject: 100**

**Enter the marks in first subject: 56.9**

**Enter the marks in second subject: 89.7**

**Enter the marks in third subject: 45.6**

**Average: 64.0667**

**Percentage: 64.0667**

1. **Find the factorial of number using recursions.**

**#include <iostream>**

**using namespace std;**

**int factorial(int num){**

**if (num <= 1){**

**return 1;**

**}**

**return num \* factorial(num-1);**

**}**

**int main(){**

**int x;**

**cout << "Enter a number: ";**

**cin >> x;**

**cout << "Factorial of " << x << " is " << factorial(x) << endl;**

**return 0;**

**}**

**Output:**

**Enter a number: 6**

**Factorial of 6 is 720**

1. **Write a recursive function to obtain first 25 numbers of fibonnaci sequence.**

**#include <iostream>**

**using namespace std;**

**int fibonacci(int n) {**

**if (n == 0)**

**return 0;**

**else if (n == 1)**

**return 1;**

**else**

**return fibonacci(n - 1) + fibonacci(n - 2);**

**}**

**int main() {**

**cout << "First 25 Fibonacci numbers are:\n";**

**for (int i = 0; i < 25; i++) {**

**cout << fibonacci(i) << " ";**

**}**

**return 0;**

**}**

**Output:**

**First 25 Fibonacci numbers are:**

**0 1 1 2 3 5 8 13 21 34 55 89 144 233 377 610 987 1597 2584 4181 6765 10946 17711 28657 46368**

1. **Write a recursive function to obtain the sum first 20 natural numbers.**

**#include <iostream>**

**using namespace std;**

**int sum(int num){**

**if (num == 0)**

**{**

**return 0;**

**}**

**return num + sum(num-1);**

**}**

**int main() {**

**cout << "Sum of first 20 natural numbers: " << sum(20) << endl;**

**return 0;**

**}**

**Output: Sum of first 20 natural numbers: 210**