

XI – COMPUTER SCIENCE

C++ PROGRAMMING

PRACTICAL ALGORITHM

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1. GROSS SALARY

Aim:

To write a C++ program to input basic salary of an employee and calculate its gross salary.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'else if' statement.

Basic salary <25000 : HRA = 20%, DA=80%

Basic salary >= 25000 : HRA=25%, DA=90%

Basic salary >= 4000 : HRA=30%, DA=95%

4. void get data and void put data.
5. To execute the program.
6. Stop the program.

Program & Output

Result:

Thus the Program basic salary of an employee and its gross salary is successful and output has been verified.

2. PERCENTAGE

Aim:

To write a C++ program to check percentage of a student and display the division (distinction, first, second, third or fail) scored using switch case.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'Switch case' statement.

Percentage	Division
>=80	Distinction
>=60 and <80	First division
>=50 and <60	Second division
>=40 and <50	Third division
<40	Fail

4. void get data and void put data.

5. To execute the program.

6. Stop the program.

Program & Output

Result:

Thus the Program to check a student percentage & display division is successful and output has been verified.

3. PALINDROM

Aim:

To write a C++ program to enter any number and check whether the number is palindrom or not using while loop.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'while' and 'if...else' statement.
4. void get data and void put data.
5. To execute the program.
6. Stop the program.

Program & Output

Result:

Thus the Program for the number is palindrome or not is successful and output has been verified.

4. NUMBER CONVERSION

Aim:

To write a C++ program to number conversion using do while loop.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'do while' and 'switch'.
4. Convert a Decimal to binary number.
5. Convert a binary number to Decimal.
6. void get data and void put data.
7. To execute the program.
8. Stop the program.

Program & Output

Result:

Thus the Program for number conversion is successful and output has been verified.

5. FIBONACCI PRIME SERIES

Aim:

To write a C++ program for generate the Fibonacci series till n terms using function.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.

3. To check 'if...else' and 'for'.
4. void get data and void put data.
5. To execute the program.
6. Stop the program.

Program & Output

Result:

Thus the Program for generate the Fibonacci series is successful and output has been verified.

6. INSERT / DELETE IN AN ARRAY

Aim:

To write a C++ program to Insert and Delete elements in single dimension array.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'for', 'switch' and 'do while'.
4. To create a Insert and Delete function.
5. void get data and void put data.
6. To execute the program.
7. Stop the program.

Program & Output

Result:

Thus the Program for insert and delete elements in array is successful and output has been verified.

7. BOUNDARY ELEMENT OF A MATRIX

Aim:

To write a C++ program to print boundary elements of a matrix.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'for', 'if' and array.
4. void get data and void put data.
5. To execute the program.
6. Stop the program.

Program & Output

Result:

Thus the Program for boundary elements of matrix is successful and output has been verified.

8. ABC PUBLISHERS

Aim:

To write a C++ program to the ABC publishers using classes.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'class' and 'objects'.
4. void get data and void put data.
5. To execute the program.
6. Stop the program.

Program & Output

Result:

Thus the Program for ABC publishers using class is successful and output has been verified.

9. EMPLOYEE DETAILS USING CLASS

Aim:

To write a C++ program to create employee details using class.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'class' and 'object'.
4. Calculate bp, hra, da, pf and np.
5. void get data and void put data.
6. To execute the program.
7. Stop the program.

Program & Output

Result:

Thus the Program for employee detail using class is successful and output has been verified.

10. STUDENT DETAILS

Aim:

To write a C++ program to student details using class.

Algorithm:

Steps:-

1. Start the program.
2. To create the variable.
3. To check 'class' and 'object'.
4. Calculate Total marks.
5. void get data and void put data.
6. To execute the program.

7. Stop the program.

Program & Output

Result:

Thus the Program for student details using class is successful and output has been verified.

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1 - GROSS SALARY

```
#include <iostream.h>
#include<iomanip.h>
#include<conio.h>

int main()
{
float basic, gross, da,hra;

/* Input basic salary of employee */

cout<<"Enter basic salary of an employee: ";
cin>>basic;

/* Calculate D.A and H.R.A according to specified conditions */

if(basic <25000)
{
da = basic *80/100;
hra= basic *20/100;
}
else if (basic >=25000 && basic<40000)
{
da = basic *90/100;
hra= basic *25/100;
}
else if (basic>=40000)
{
da = basic *95/100;
hra= basic *30/100;
}

/* Calculate gross salary */

gross= basic +hra+ da;
cout<<setw (25) << "Basic Pay " <<setw (10)<< basic<<endl;
cout<<setw (25) << " Dearness Allowance" <<setw (10)<< da <<endl;
cout<<setw (25) "House Rent Allowance " <<setw (10)<<hra<<endl;
cout<<setw (25) " " <<setw (10) <<"-----" <<endl;
cout<<setw (25) "Gross Salary " <<setw (10) << gross <<endl;
cout<<setw (25) " " <<setw (10) <<"-----" <<endl;
return 0;
}
```

Output

```
Enter basic salary of an employee    : 25000
Basic Pay                            : 25000
Dearness Allowance                   : 22500
House Rent Allowance                 : 6250
-----
Gross Salary                         : 53750
-----
```

2 - PERCENTAGE

```
#include <iostream.h>
#include <conio.h>

int main()
{
    float percent;
    int x;
    cout<<"Enter your percentage: ";
    cin>>percent;
    cout<<"You scored "<<percent<<"%"<<endl;
    x = percent/10;

    switch(x)
    {
        case 10:
        case 9:
        case 8:
            cout<<"You have passed with Distinction";
            break;
        case 7:
        case 6:
            cout<<"You have passed with First division";
            break;
        case 5:
            cout<<"You have passed with Second division";
            break;
        case 4:
            cout<<"You have passed with Third division";
            break;
        default:
            cout<<"Sorry: You have failed";
    }
    return 0;
}
```

Output 1

```
Enter your percentage: 79
You scored 79%
You have passed with First division
```

Output 2

```
Enter your percentage: 39
You scored 39%
Sorry: You have failed
```

3 - PALINDROME

```
#include <iostream.h>
#include<conio.h>

int main()
{
int n,num, digit, rev =0;
cout<<"Enter a positive number: ";
cin>>num;
n =num;

while(num)
{
digit=num%10;
rev=(rev *10)+ digit;
num=num/10;
}

cout<<" The reverse of the number is: "<< rev <<endl;

if(n == rev)
cout<<" The number is a palindrome";

else
cout<<" The number is not a palindrome";

return 0;
}
```

Output 1

Enter a positive number to reverse: 1234
The reverse of the number is: 4321
The number is not a palindrome

Output 2

Enter a positive number to reverse: 1221
The reverse of the number is: 1221
The number is a palindrome

4 - NUMBER CONVERSION

```
#include <iostream.h>
#include <cmath.h>
#include <conio.h>

int main()
{
int dec,d,i,temp,ch;
long int bin;
do
{
dec=bin=d=i=0;
cout<<"\n\n\t\tMENU\n1. Decimal to Binary number\n2.Binary to Decimal number\n3.Exit\n";
cout<<"Enter your choice(1/2/3)";
cin>>ch;

switch(ch)
{
case 1: cout<< "Enter a decimal number: "; cin>>dec;
temp=dec;

while(dec!=0)
{
d = dec%2;
bin += d * pow(10,i);
dec /= 2;
i++;
}

cout<< temp << " in decimal = " << bin << " in binary" <<endl ;break;
case 2: cout<< "Enter a binary number: "; cin>> bin;
temp=bin;

while(bin!=0)
{
d = bin%10;
dec += d*pow(2,i);
bin /= 10;
i++;
}

cout<< temp << " in binary = " <<dec<< " in decimal";
break;

case 3: break;

default :cout<<"Invalid choice";
}
} while (ch!=3);
return 0;
}
```

Output 1

MENU

- 1.Decimal to Binary number
- 2.Binary to Decimal number
- 3.Exit

Enter your choice(1/2/3) 1

Enter a decimal number: 23

23 in decimal = 10111 in binary

MENU

- 1.Decimal to Binary number
- 2.Binary to Decimal number
- 3.Exit

Enter your choice(1/2/3) 2

Enter a binary number: 11001

11001 in binary = 25 in decimal

MENU

- 1.Decimal to Binary number
- 2.Binary to Decimal number
- 3.Exit

Enter your choice(1/2/3) 3

Output 2

MENU

- 1.Decimal to Binary number
- 2.Binary to Decimal number
- 3.Exit

Enter your choice(1/2/3) 4

Invalid choice

MENU

- 1.Decimal to Binary number
- 2.Binary to Decimal number
- 3.Exit

Enter your choice(1/2/3) 3

5 - FIBONACCI PRIME SERIES

```
#include <iostream.h>
#include <stdlib.h>
#include <conio.h>

void Primechk (int a )
{
    int j;

    if( a == 0 || a == 1 )
    {
        cout<< " NEITHER PRIME NOR COMPOSITE ";}

    else
    {
        for(j = 2 ; j<a; j++)
        {
            if(a%j==0)
            {
                cout<< "\tCOMPOSITE" ;
                break ;
            }
        }

        if( a==j )
        cout<< "\tPRIME" ;
    }
}

void fibo ( int n )
{
    int a = -1 , b = 1 ,c=0 ;
    for( int i = 1 ; i <= n ; i++)
    {
        cout<<endl;
        c = a + b ;
        cout<<c;
        Prime chk(c);
        a = b;
        b = c ;
    }
}

int main ()
{
    int n ;
    cout<< " ENTER THE NUMBER OF REQUIRED FIBO TERMS " ;
    cin>> n ;
    cout<< "\n\tFIBONACCI SERIES\n " ;
    fibo (n) ;
    return 0;
}
```

Output

ENTER THE NUMBER OF TERMS 10
FIBONACCI SERIES
0 NEITHER PRIME NOR COMPOSITE
1 NEITHER PRIME NOR COMPOSITE
1 NEITHER PRIME NOR COMPOSITE
2 PRIME
3 PRIME
5 PRIME
8 COMPOSITE
13 PRIME
21 COMPOSITE
34 COMPOSITE

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6 - INSERT / DELETE ELEMENTS IN AN ARRAY

```
#include<iostream.h>
#include<conio.h>

int a[20],b[20],c[40];
int m,n,p,val,i,j,key,pos,temp;

/*Function Prototype*/

void display();
void insert();
void del();
int main()
{
int choice;
cout<<"\nEnter the size of the array elements:\t";
cin>>n;
cout<<"\nEnter the elements for the array:\n";

for(i=0;i<n;i++)
{
cin>>a[i];
}

do{
cout<<"\n\n-----Menu-----\n";
cout<<"1.Insert\n";
cout<<"2.Delete\n";
cout<<"3.Exit\n";
cout<<"-----";
cout<<"\nEnter your choice:\t";
cin>>choice;

switch(choice)
{
case 1: insert();
break;
case 2: del();
break;
case 3:break;
default:cout<<"\nInvalid choice:\n";
}
}
while(choice!=3);
return 0;
}

void display() //displaying an array elements
{
int i;
cout<<"\nThe array elements are:\n";
for(i=0;i<n;i++)
{
```



```

cout<<a[i]<<" ";
}
} //end of display()
void insert() //inserting an element in to an array
{
cout<<"\nEnter the position for the new element:\t";
cin>>pos;
cout<<"\nEnter the element to be inserted :\t";
cin>>val;
for(i=n; i>=pos-1; i--)
{
a[i+1]=a[i];
}
a[pos-1]=val;
n=n+1;
display();
} //end of insert()
void del() //deleting an array element
{
cout<<"\n Enter the position of the element to be deleted:\t";
cin>>pos;
val= a [pos];
for(i= pos;i<n-1;i++)
{
a[i]=a[i+1];
}
n=n-1;
cout<<"\nThe deleted element is = "<<val;
display();
} //end of delete()

```

Output

Enter the size of the array elements: 5

Enter the elements for the array:

1

2

3

4

5

-----Menu-----

1.Insert

2.Delete

3.Exit

Enter your choice: 1

Enter the position for the new element: 3

Enter the element to be inserted : 26

The array elements are:

1 2 26 3 4 5

-----Menu-----

1.Insert

2.Delete

3.Exit

Enter your choice: 2

Enter the position of the element to be deleted: 2

The deleted element is = 2

The array elements are:

1 3 26 4 5

-----Menu-----

1.Insert

2.Delete

3.Exit

Enter your choice: 3

7 - BOUNDARY ELEMENT OF A MATRIX

```
#include <iostream.h>
#include<conio.h>

void print Boundary (int a[][10], int m, int n)
{
for(int i = 0; i < m; i++)
{
for(int j = 0; j < n; j++)
{
if(i==0|| j==0||i==m-1||j==n-1)
cout<<a[i][j]<<" ";
else
cout<<" ";
}
cout<<endl ;
}
}

// Driver code

int main()
{
int a[10][10] ,i,j,m,n;
cout<<"Enter more than 3 number of rows and columns"<<endl;
cin>>m>>n;
for(i=0;i<m;i++)
{
for(j=0;j<n;j++)
{
cout<<"enter the value for array["<<i+1<<"]"<<"["<<j+1<<"] :";
cin>>a[i][j];
}
}
system("cls");
cout<<"\n\nOriginal Array\n";
for(i=0;i<m;i++)
{
for(j=0;j<n;j++)
{
cout<<a[i][j]<<" ";
}
cout<<endl;
}
cout<<"\n\n The Boundry element\n";
print Boundary(a, m, n);
return 0;
}
```

Output

Enter more than 3 number of rows and columns

4 4

enter the value for array[1][1] :1

enter the value for array[1][2] :2

enter the value for array[1][3] :3

enter the value for array[1][4] :4

enter the value for array[2][1] :5

enter the value for array[2][2] :6

enter the value for array[2][3] :7

enter the value for array[2][4] :8

enter the value for array[3][1] :9

enter the value for array[3][2] :0

enter the value for array[3][3] :1

enter the value for array[3][4] :2

enter the value for array[4][1] :3

enter the value for array[4][2] :4

enter the value for array[4][3] :5

enter the value for array[4][4] :6

Original Array

1 2 3 4

5 6 7 8

9 0 1 2

3 4 5 6

The Boundary element

1 2 3 4

5 8

9 2

3 4 5 6

8 - ABC PUBLISHERS

```
#include<iostream.h>
#include<stdlib.h>
#include<conio.h>

int id=1001;
class Publisher
{
int Bookno;
char Title[20];
char Author [10];
float Price;
float Totamt;
float calculate (int);
public:
Publisher()
{
Bookno=id;
Title[0]='\0';
Author[0]='\0';
Price=0;
Totamt=0;
id++;
}
void Readdata();
void Displaydata();
};
void Publisher::Readdata()
{
int nocopies;
cout<<"Enter the Title name ";cin>>Title;
cout<<"Enter the Author name ";cin>>Author;
cout<<"Enter the Price ";cin>>Price;
cout<<"Enter the Number of copies ";cin>>nocopies;
Totamt=calculate(nocopies);
}
float Publisher::calculate(int x)
{
return x*Price;
}
void Publisher::Displaydata()
{
cout<<"\n\t\tABC PUBLISHERS\n";
cout<<"\t\t~~~~~\n";
cout<<"\t\t INVOICE\n";
cout<<"\t\t ~~~~\n";
cout<<"\n===== \n";
cout<<" Book Number : "<<Bookno<<endl;
cout<<"Title : "<<Title<<endl;
cout<<"Author Name : "<<Author<<endl;
cout<<"Price Per Book : "<<Price<<endl;
cout<<"Total Amount : "<<Totamt<<endl;
cout<<"\n===== \n";
```

```

}
int main()
{
int n,i;
Publisher p[10];
cout<<"Enter the number of object to be created";
cin>>n;
for(i=0;i<n;i++)
p[i].Readdata();
for(i=0;i<n;i++)
p[i].Displaydata();
return 0;
}

```

Output

```

Enter the number of object to be created2
Enter the Title name C++Programming
Enter the Author name Balaguru
Enter the Price 500
Enter the Number of copies 3
Enter the Title name CoreJava
Enter the Author name Xavier
Enter the Price 250
Enter the Number of copies 5
ABC PUBLISHERS

```

```

~~~~~
INVOICE
~~~~~
=====

```

```

Book Number : 1001
Title : C++Programming
Author Name :Balaguru
Price Per Book : 500
Total Amount : 1500
=====

```

```

ABC PUBLISHERS

```

```

~~~~~
INVOICE
~~~~~
=====

```

```

Book Number : 1002
Title :CoreJava
Author Name : Xavier
Price Per Book : 250
Total Amount : 1250

```

9 - EMPLOYEE DETAILS USING CLASS

```
#include<iostream.h>
#include<conio.h>

class emp
{
public:
int eno;
char name[20], des[20];
void get()
{
cout<<"Enter the employee number:";
cin>>eno;
cout<<"Enter the employee name:";
cin>>name;
cout<<"Enter the designation:";
cin>>des;
}
};

class salary :public emp
{
float bp,hra, da,pf,np;
public:
void get1()
{
cout<<"Enter the basic pay:";
cin>>bp;
cout<<"Enter the HouseRent Allowance:";
cin>>hra;
cout<<"Enter the Dearness Allowance :";
cin>>da;
cout<<"Enter the Provident Fund:";
cin>>pf;
}
void calculate()
{
np=bp+hra+ da-pf;
}
void display()
{
cout<<eno<<"\t"<<name<<"\t"<<des<<"\t"<<bp<<"\t"<<hra<<"\t"<<da<<"\t"<<pf<<"\t"<<np
<<"\n";
}
};

int main()
{
int i, n;
char ch;
salary s[10];
cout<<"Enter the number of employee:";
cin>>n;
for(i =0; i < n; i++){
```

```

s[i].get();
s[i].get1();
s[i].calculate();
}
cout<<"\n\t\tEmployee Details\n";
cout<<"\ne_no \t e_name\t des \t bp \t hra \t da \t pf \t np \n";
for(i =0; i < n; i++){
s[i].display();
}
return 0;
}

```

Output

Enter the number of employee:2
Enter the employee number:1201
Enter the employee name:Ramkumar
Enter the designation:Engineer
Enter the basic pay:50000
Enter the House Rent Allowance:10000
Enter the Dearness Allowance :5000
Enter the Provident Fund:1000

Enter the employee number:1202
Enter the employee name:Viswanathan
Enter the designation:Engineer-Tech
Enter the basic pay:40000
Enter the House Rent Allowance:9000
Enter the Dearness Allowance :4500
Enter the Provident Fund:1000

Employee Details

e_no	e_name	des	bp	hra	da	pf	np
1201	Ramkumar	Engineer	50000	10000	5000	1000	64000
1202	Viswanathan	Engineer-Tech	40000	9000	4500	1000	52500

10 -STUDENT DETAILS

```
#include<iostream.h>
#include<conio.h>

class Student
{
protected:
int Rno;
public:
void Readno(intr)
{
Rno=r;
}
void Writeno()
{
cout<<"\nRoll no : "<<Rno;
}
};
class Test :public Student
{
protected:
float Mark1,Mark2;
public:
void Readmark (float m1,float m2)
{
Mark1=m1;
Mark2=m2;
}
void Writemark()
{
cout<<"\n\n\tMarks Obtained\n ";
cout<<"\n Mark1 : "<<Mark1;
cout<<"\n Mark2 : "<<Mark2;
}
};

class Sports
{
protected:
int score;// score = Sports mark
public:
void Readscore (ints)
{
score=s;
}
void Writescore()
{
cout<<"\n Sports Score : "<<score;
}
};

class Result :public Test,public Sports
{
```

```
int Total;
public:
void display()
{
Total = Mark1 + Mark2 + score;
Write no();
Write mark();
Write score();
cout<<"\n\n Total Marks Obtained : "<< Total<<endl;
}
};

int main()
{
Result stud1;
stud1.Readno(1201);
stud1.Readmark(93.5,95);
stud1.Readscore(80);
cout<<"\n\t\t HYBRID INHERITANCE PROGRAM\n";
stud1.display();
return 0;
}
```

Output

```
HYBRID INHERITANCE PROGRAM
Roll no : 1201
Marks Obtained
Mark1 : 93.5
Mark2 : 95
Sports Score : 80
Total Marks Obtained : 268
```