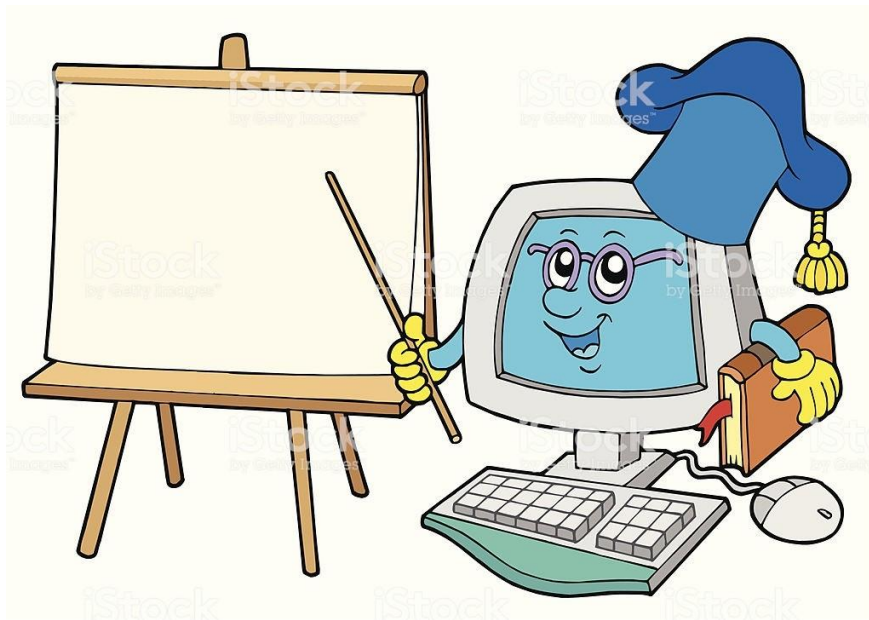# HIGHER SECONDARY FIRST YEAR

COMPUTER SCIENCE

PRACTICAL PROGRAMS

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HIGHER SECONDARY FIRST YEAR - COMPUTER SCIENCE
PRACTICAL PROGRAMS

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PRACTICAL PROGRAMS
CS1 - GROSS SALARY

1. Write a C++ program to input basic salary of an employee and calculate its Gross salary according to following:

Basic Salary <25000	HRA = 20%	DA = 80%
Basic Salary >= 25000	HRA = 25%	DA = 90%
Basic Salary >= 40000	HRA = 30%	DA = 95%

Aim:

To write a C++ program for input basic salary of an employee and calculating its Gross salary.

Coding:

```cpp
#include<iostream>
#include<iomanip>
using namespace std;
int main()
{
float basic,gross,da,hra;
cout<<"Enter Basic salary of an employee:";
cin>>basic;
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;
}
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
                          ...........................
```

Result:

Thus, the program for calculating Gross Salary has been created and executed successfully.

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

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

Aim:

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

Coding:

```
#include<iostream>
using namespace std;
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

Result:

Thus, the program for finding percentage of student has been created and executed successfully.

3. **Write a C++ program to enter any number and check whether the number is palindrome or not using while loop.**

   Aim:

   To write a C++ program for entering any number and checking whether the number is palindrome or not using while loop

   Coding:

```cpp
#include<iostream>
using namespace std;
int main()
{
int num,n,digit,rev=0;
cout<<"Enter the 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 the positive number: 1221
   The reverse of the number is: 1221
   The number is a Palindrome

   Output 2 :

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

   Result:

   Thus, the program for checking a number is Palindrome or not has been created and executed successfully.

CS4 - NUMBER CONVERSION

4. **Using do while loop create the following menu based C++ program**
   1.Convert a Decimal to binary number
   2.Convert a binary number to Decimal   3. Exit

Depending on the choice accept the value and display the result .The program should continue till the user select the third option.

Aim:

To create a C++ program for number conversion using do while loop

Coding:

```cpp
#include<iostream>
using namespace std;
#include<cmath>
int main()
{
int dec,d,i,temp,ch;
long int bin;
do
{
dec=bin=d=i=0;
cout<<"\n\n\t\t MENU \n 1. DECIMAL TO BINARY NUMBER\n 2.
BINARY TO DECIMAL NUMBER\n  3. EXIT\n";
cout<<"Enter your choice(1/2/3)";
cin>>ch;
switch(ch)
{
case 1: cout<<"Enter the Decimal Number :";
cin>>dec;
temp=dec;
while(dec!=0)
{
d=dec%2;
bin+=d*pow(10,i);
dec/=2;
i++;
}
cout<<"The Binary Number is:"<<bin; break;
case 2:
cout<<"Enter the Binary Number :";
cin>>bin;
temp=bin;
while(bin!=0)
{
d=bin%10;
dec+=d*pow(2,i);
bin/=10;
i++;
}
cout<<"The Decimal Number is:"<<dec; 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 the Decimal Number : 23
        The Binary Number is: 10111

Output 2 :   MENU
        1. DECIMAL TO BINARY NUMBER
        2.BINARY TO DECIMAL NUMBER
        3.EXIT
        Enter Your Choice (1/2/3) 2
        Enter the Binary Number : 11001
        The Decimal Number is: 25

Output 3 :   MENU
        1. DECIMAL TO BINARY NUMBER
        2.BINARY TO DECIMAL NUMBER
        3.EXIT
        Enter Your Choice (1/2/3) 3

Output 4 :   MENU
        1. DECIMAL TO BINARY NUMBER
        2.BINARY TO DECIMAL NUMBER
        3.EXIT
        Enter Your Choice (1/2/3) 4
        Invalid Choice

Result:

Thus, the program Number Conversion has been created and executed successfully.

CS5 - FIBONACCI PRIME SERIES

5. **Write a C++ program using a user defined function to generate the Fibonacci series till n terms and print if each term is prime or Composite.**

   Aim:

   To write a C++ program using a user defined function for generating the Fibonacci series till n terms and print if each term is prime or composite.

   Coding:

```cpp
#include<iostream>
#include<stdlib.h>
using namespace std;
void Primechk(int a)
{
int j;
if(a==0||a==1)
{
cout<<"\tNEITHER 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;
Primechk(c);
a=b;
b=c;
}
}
int main()
{
int n;
cout<<"ENTER THE NUMBER OF REQUIRED FIBO TERMS...";
cin>>n;
cout<<"\n\t FIBONACCI SERIES\n";
fibo (n);
return 0;
}
```

Output:

ENTER THE NUMBER OF REQUIRED FIBO 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
```

Result:

Thus, the program Fibonacci Prime Series has been created and executed successfully.

6. **Write a menu driven C++ program to Insert and Delete elements in a single dimension array of integers and print the array after insertion or deletion.**

Aim:

To write a menu driven C++ program for Inserting and Deleting elements in a single dimension array of integers and print the array after insertion or deletion.

Coding:

```cpp
#include<iostream>
using namespace std;
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]<<" ";
}
```

```cpp
}//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

Result:

Thus, the program Insert or Delete elements in an array has been created and executed successfully.

CS 7 - Boundary Element of a Matrix

7. **Write a C++ program to print boundary elements of a matrix**

Aim:

To write a C++ program for printing boundary elements of a matrix.

Coding:

```cpp
#include <iostream>
using namespace std;
void printBoundary (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";
printBoundary(a, m, n);
return 0;
}
```

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

Result:

Thus, the program Boundary element of a matrix has been created and executed successfully.

8. **Define a class named Publisher in C++ with the following descriptions**

private members

Bookno integer

Title 20 characters

Author 10 characters

price float

Totamt float

Define a member function called calculate() to calculate the number of copies and the price and return the total amount.

Public members

A default constructor function to initialize all data members.The book number must be automatically generated staring from 1001

Readdata() function to accept values for Title,Author and price.Get the number of copies from the user and invoke calculate().

Display data () function display all the data members in the following format

<div align="center">

ABC PUBLISHERS

~~~~~~~~~~~~~~~~~

INVOICE

~~~~~~~~~

=================================

Book Number :

Title :

Author Name :

Price Per Book :

Total Amount :

=================================.

</div>

Aim: To write a program for defining a class named Publisher.

Coding:

```cpp
#include<iostream>
#include<stdlib.h>
using namespace std;
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++;
}
```

```cpp
void Readdata();
void Displaydata();
};
void Publisher::Readdata()
{
int nocopies;
cout<<"\nEnter the Title name ";cin>>Title;
cout<<"\nEnter the Author name ";cin>>Author;
cout<<"\nEnter the Price ";cin>>Price;
cout<<"\nEnter 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
=================================
```

Result:

Thus, the program ABC Publishers has been created and executed successfully.

CS9 - EMPLOYEE DETAILS USING CLASS

9. **Create a C++ program to create a class employee contains the following members in public.**

Public members
> **eno integer**
> **name 20 characters**
> **des 20 characters**

member Function

void get() to accept values for all data members

Declare the derived class called Salary which contain the following details.

Public members

bp, hra, da, pf, np float

member Function

void get1() to accept values for bp,hra,da and pf and invoke calculate()

calculate() calculate the np by adding bp,hra,da subtracting pf

display() Display all the details

Create the derived class object and read the number of employees.Call the function get(),get1() for each employee and display the details**.**

Aim:
> To write a C++ Program for creating a class employee containing their details

Coding:

```cpp
#include<iostream>
using namespace std;
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;
```

```cpp
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\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

Result:

Thus, the program Employee Details Using Class has been created and executed successfully.

10. **Write a C++ program to create a class called Student with the following details**

Protected member

Rno integer

Public members

void Readno(int); to accept roll number and assign to Rno

void Writeno(); To display Rno.

The class Test is derived Publically from the Student class contains the following details

Protected member

Mark1 float

Mark2 float

Public members

void Readmark(float,float); To accept mark1 and mark2

void Writemark(); To display the marks

Create a class called Sports with the following detail

Protected members

score integer

Public members

void Readscore(int); To accept the score

void Writescore(); To display the score

The class Result is derived Publically from Test and Sports class contains the following details

Private member

Total float

Public member

void display() assign the sum of mark1 ,mark2,score in total.

invokeWriteno(),Writemark() and Writescore() .Display the total also.

Aim:

To write a C++ program for creating a class called Student their details

Coding:

```
#include<iostream>
using namespace std;
class Student
{
protected:
int Rno;
public:
void Readno(int r)
{
Rno=r;
}
void Writeno()
{
cout<<"\nRoll no : "<<Rno;
}
};
class Test :public Student
{
protected:
float Mark1,Mark2;
public:
```

```cpp
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 (int s)
{
score=s;
}
void Writescore()
{
cout<<"\n Sports Score : "<<score;
}
};
class Result :public Test,public Sports
{
int Total;
public:
void display()
{
Total = Mark1 + Mark2 + score;
Writeno();
Writemark();
Writescore();
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\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
```

Result:

Thus, the program Student Details has been created and executed successfully.

Education Is A Social Process.

Education Is Growth.

Education Is Not A

Preparation For Life;

Education Is Life Itself.

ALL THE BEST!

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