

## OOPS Program List

- 1) Write a C++ program that will ask for a temperature in Fahrenheit, display in Celsius.
- 2) Create a class student which stores the detail about roll no, name, marks of 5 subjects i.e. Science, Maths, English, C-language C++. The class must have the following:
  - Get function to accept value of data members.
  - Display function to display values of data members.
  - Total function to add marks of all 5 subjects and store it in the data members named Total.
- 3) Enter student name and percentage. If percentage of student is  $\leq 40$  then display the message "Performance not good, Try next time." If percentage is  $> 40$  but  $\leq 60$  then display "Good Work, put more efforts." If percentage is  $> 60$  then display the message "Excellent Work".
- 4) Create Bank class that contains following and display the balance
  - Data members**
    - Name
    - Account no
    - Amount
    - Type of account
  - Data functions**
    - Open Account (Initialize)
    - Withdrawn from customer
    - Accept Deposit
    - Update the balance.
- 5) Create a class student that contains following
  - Data members**  
No, Name, Div, Std
  - Data functions**
    1. SetRecord
    2. GetRecord
- 6) Create a program for a shop which accepts details as item\_id, item name, quantity and item cost. Accepts details of four items sold and prepare a bill. Create a class shop which contains item\_id, item name, quantity, item cost, and total Bill amount.
- 7) An election is contested by 5 candidates. The candidates are numbered 1 to 5 and the voting is done by marking the candidate number on the ballot paper. WAP to read the ballots and count the votes cast for each candidate using an array variable count. In case, a number read is outside the range 1 to 5, the ballot should be considered as a "spoilt ballot" and the program should also count the number of spoilt ballot.
- 8) A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not then an appropriate message should be displayed. If it is then the system displays the book details and requests for the number of copies required. If the requested are available, the total cost of the requested copies is displayed;

otherwise the message "Required copies not in stock" is displayed. Design a system using a class called books with suitable member functions and constructors. Use new operator in constructors to allocate memory space required.

- 9) Write a class to represent a vector (a series of integer values). Include the member functions to perform the following tasks.
- To create the vector
  - To modify the value of a given element.
  - To multiply by a scalar value.
  - To display the vector in the form (10, 20, 30)
- Write a main program to test your class.

- 10) An electricity board charges the following rates to domestic users to discourage large consumption of energy:
- For the first 100 units - 60P per unit  
 For next 200 units - 80P per unit  
 Beyond 300 units - 90P per unit
- All users are charged a minimum of Rs. 50.00. If the total amount is more than Rs 300.00 then an additional surcharge of 15% is added. Write a program to read the names of users and number of units consumed and print out the charges with names.

- 11) A cricket team has the following table of batting figures for a series of test matches:

Player's Name	Runs	Innings	Times Not Out
Sachin	8430	230	18
Saurav	4200	130	9
Rahul	3350	105	11
.....	.....	.....	.....

- 12) Addition of series like 1234 then answer  $1+2+3+4 = 10$
- 13) WAP to swap two variables using Reference variable.
- 14) WAP using function overloading to make addition of 2 integers, 3 integers, 2 float as well as three float values.
- 15) WAP using function overloading such that if i call function add with 2 strings then it performs concats and if I call add functions with 2 numbers then perform additions.
- 16) Include the programs of static data members as well as static member functions done in the class. Also include programs of friend functions.
- 17) Write a program showing how the constructors are called in a program.  
 Create a class test having multiple constructors; one constructor having no parameter, one constructor having one parameter and one constructor having two parameters. Create objects of that class and call other member functions.
- 18) Write a program to show how we can use multiple constructors simultaneously in one class. Create class complex. And add two complex numbers with the help of function.
- 19) Create a class student with stores the roll number, name and stores marks obtained in 2 subjects. Calculate the total marks obtained in the test.  
 Write a main function to implement the above class and display the output.
- 20) Write a program to show the dynamic initialization of object.
- 21) Write a program to show the copy constructor concept.

- 22) Write a program to show how destructors are called while the program is terminated.
- 23) Create a class str with two data members i.e. int length and char \* p. Allocate memory for them by using dynamic constructors and also use destructor.
- 24) A book shop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book, the sales person inputs the title and author and the system searches the list and displays whether it is available or not. If it is not then an appropriate message should be displayed. If it is then the system displays the book details and requests for the number of copies required. If the requested are available, the total cost of the requested copies is displayed; otherwise the message "Required copies not in stock" is displayed. Design a system using a class called books with suitable member functions and constructors. Use new operator in constructors to allocate memory space required.
- 25) Write a program to overload unary minus with the help of member function as well as friend function.
- 26) Write a program to overload binary + with the help of member function as well as friend function.
- 27) Write a program to illustrate the manipulation of string using operators.
- 28) Write a program to illustrate class to basic type conversion.
- 29) Write a program to illustrate class to class type conversion.
- 30) Write a program to illustrate basic to class type conversion.
- 31) Write a program to illustrate basic to basic type conversion.
- 32) Create a class floats that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of floats.
- 33) Define a class str. Use overloaded == operator to compare two strings.
- 34) Design a class polar which describes a point in the plane using polar co-ordinates radius and angle. Use the overloaded + operator to add two objects of string. [Note: we cannot two polar values of two points directly. This requires first the conversion of points into rectangular co-ordinates, then adding the corresponding rectangular co-ordinates and finally converting the result back to polar Co-ordinates. Formulas:  
 $X=r*\cos(a)$   
 $Y=r*\sin(a)$   
 $a=\text{atan}(y/x)$   
 $r=\text{sqrt}(x*x + y*y)$ ]
- 35) Write a program to join two strings of two different objects of the same class in an internal function using the concept of this pointer. Initialize the values using the various types of constructors
- 36) Create two classes called uscurrency and Indian currency to store dollar and rupees respectively. Define functions to read and show data in both classes. Overload + operator to add an uscurrency object and Indian currency object and return the sum in term of paisa.
- 37) Create classes called Celsius and Fahrenheit to store temperature in terms of Celsius and Fahrenheit respectively. Include necessary functions to read and display the values. Define conversion mechanism to convert Celsius to Fahrenheit object and vice versa. Show both types of conversion in main function.
- 38) Create one class which contains member data called feet and inch and create another class which contains distance in meter and centimetre. Write a program to convert one distance in the another distance with use of type conversion.(1 meter = 3.28 feet)

- 39) Create a class called 'Actor' with name and movies as data members. Include constructor to read data. Define a friend function 'compare' that compares two actors and displays the name of the actor, who has performed in more number of movies.
- 40) Create a class called vegetable with data members, vn (Vegetable Name) and ppk (Price Per Kilo). Read data for four different vegetables.  
 Potato : Rs. 25 / K.G      Cabbage : Rs. 15 / K.G  
 broccoli : Rs. 20 /K.G      Beans : Rs. 50 / K.G  
 Create a friend function that allows us to purchase any three types of vegetables and returns the total amount.
- 41) Create a class "student" which contains Roll\_no. Create a class named "Test" inherits "student" class and which contain Exam\_1, and Exam\_2 as data members. Create another class named "sports" which contain score as data member. Create a class "result" which inherits "test" and "sports" class both and which has a data member total. (total=score+Exam\_1+Exam\_2).
- 42) Create a class "Account" which contains cust\_name, ac\_no and type\_of\_ac from this derived the classes "Cur\_ac" and "Save\_ac". Include necessary member functions in order to achieve following tasks.
- Accept deposit from the customer and update the balance.
  - Display the balance.
  - Compute and deposit interest.
  - Permit withdrawal and update the balance.
  - Check for minimum balance, impose penalty, necessary and update the balance.
- 43) Derive class "result" having data member Total from the class "test" having data members Exam1 and Exam 2 which is again derived from the class "student" having data member Roll Number.
- 44) Create a class "media" having data members Title and Price. Derive two classes from it - (i) "tape" having data member Minutes and (ii) "book" having data member No. of pages.
- 45) Derive class "result" having data member Total from the class "test" having data members Exam1 and Exam 2 and "sports" having data member Score. These two classes are again derived from the class "student" having data member Roll Number.
- 46) Derive a class "faculty" having data members Designation, Salary and Qualification from the class "Person" having data members Name and Date of Birth. Make the class "person" as an abstract class.
- 47) Define classes "Teaching" having data members department and publication and "Non-teaching" having data members designation and extra-holiday. Derive these two classes from "General" class having data member code and name. Now derive an Array object of 5 elements for teaching class and another array object of 5 elements for non-teaching class. Read all the array elements of teaching class in alphabetical order on department and array elements of non-teaching class in descending order on extra-holiday.
- 48) Derive class DC from class BC and there should be at least one function with same name in both the classes. Make base class pointer to point to derived class

and call function with same name in the derive class. (Function having same name in base class as of derived class is not a virtual function.)

- 49) Derive a class B from class A. Access the member functions of base class from base class pointer and access derived class functions from derived class pointer.
- 50) Create a class "media" having data members Title and Price. Derive two classes from it - (i) "tape" having data member Minutes and (ii) "book" having data member No. of pages. Make use of virtual functions.
- 51) Write a program to demonstrate the pure virtual function with the following:
- Create a class 'polygon' with two data members width and height and both of them should be of float type. It should have two member functions 'set\_value()' and 'area()'. Function 'set\_value()' should have two parameters while 'area()' should be a pure virtual function.
  - Derive a class 'rectangle' from the class 'polygon' with a function 'area()' which returns the area of rectangle.
  - Derive a class 'triangle' from the class 'polygon' with a function 'area()' which returns the area of triangle.
- 52) Write a program to demonstrate that pointers to the abstract base class can be used to point to objects of derived classes.
- 53) Write a program with the following:
- Create a class 'shape' with no data members. It should have a pure virtual function 'get\_area()'.
  - Derive a class 'rectangle' from the class 'shape' with two data members width and height and both of them should be of float type. Override the 'shape::get\_area()' function inside this class. This overriding function should return the area of rectangle. Write constructor of this class.
  - Derive another class 'ellipse' from the class 'shape' with two data members major\_axis and minor\_axis and both of them should be of float type. Override the 'shape::get\_area()' function inside this class. This overriding function should return the area of ellipse. Write constructor of this class.
  - Create a class 'canvas' with no data members. Its only member function, 'display()', will have a reference of the class 'shape' type as a formal argument. With this reference call the 'shape::get\_area()' function inside 'canvas::display' function.
  - In the main function, declare objects of classes 'rectangle', 'ellipse' and 'canvas'. Call the 'canvas::display' function first by passing the object of class 'rectangle' and then by passing the object of class 'ellipse' to it.
- 54) Write down program to Copy from one file to other file.
- 55) Write down program to Append file.
- 56) Count number of vowels and consonants from one file.

Hint:

```
int vowels=0, consonants=0;   char line;
//While retrieving data from the file
while(ifile.eof()==0)
{
    ifile.get(line);
    cout<<line;
    if(line=='a' | line=='e' | line=='i' | line=='o' | line=='u' |
line=='A' | line=='E' | line=='I' | line=='O' | line=='U')
        vowels++;
    else
        consonants++;
}
```

```
Cout<<vowels<<"\n"<<consonants;
```

57) Write down all the programs of Files from the book done in class.

58) Count number of spaces in one file.

Hint:

```
int space=0; char line;
//While retrieving data from the file
while(ifile.eof()==0)
{
    ifile.get(line);
    cout<<line;
    if(line==' ')
        space++;
}
Cout<<space<<"\n"
```

59) Count number of lines in one file.

```
int lines=0; char name[80];
//While retrieving data from the file
while(ifile.eof()==0)
{
    ifile.getline(name,80);
    cout<<name;
    lines++;
}
Cout<<lines<<"\n";
```

60) Read the data from one file and copy the data into odd and even files.

61) Count number of words in one file. (Hint: Check no. of spaces to count no. of words. No. of spaces and no. of words will be equal)

62) Demo of random access file. (Done in Lab)

63) Write down program to insert and retrieve an object from the file. (Done in Lab)