Brainware Computer Academy

Object Oriented Programming using C++

(Specially Designed for WBCHSE, CBSE, ICSE & ISC)

(Practical Assignment)

Session 1:

1. Write a function, which will prompt user to enter a number, after that it will show whether it is odd or even.

2. Modify the above program in such a way so that it will take a number as parameter and prompt whether it is odd or even.

3. Write a function 'prime' which will take a number as parameter and return TRUE if it is prime and FALSE if it is not prime.

Session 2:

4. Write a function called 'swap', which will take two numbers as parameter (passed-by-address) and will interchange their value and display the changed value in the main().

5. Modify the above program in such a way so that it will be ab le to display the changed value in the swap() & as well as main() function (using reference).

Session 3:

6. Write a function, which will take three numbers as parameter and returns the highest number of them [using nested if].

7. Write a function 'line' which will draw a line of a desired length with a desired character. The function will take two parameters, a character by which the line is to be drawn and the length of the line. If the user does not provide any parameter at the time of calling it will take '* ' and 80 as default to draw the line.

Session 4:

8. Write function 'add' to add two integers, floating point and double precision floating-point numbers.

9. Modify the above program so that the parameters become read only i.e. the function could not modify the values of the parameter.

Session 5:

10. Write a function to concatenate two strings and return the resultant string.

11. Write a program to determine whether a word is palindrome (MADAM) or not.

12. Write a structure named student having the following dada members :
    a. Roll
    b. Name
    c. Marks

    Write a program with appropriate functions to input data & display data.

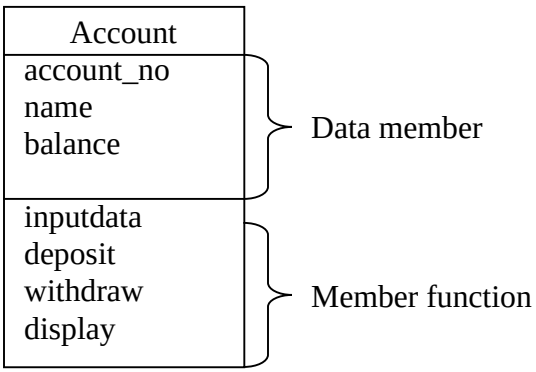
Session 6:

13. Re-write the above program no.12 where input & display functions are the member functions of the structure.

14. Re-define the input() function in a manner so that, if marks is not supplied as argument marks of that student will be set to 0.

Session 7:

15.



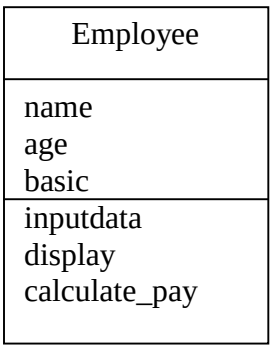
a. Define the above class of a bank account.
b. Define all the member functions inside the class.
c. Give appropriate comment stating what type of function definition it is.
d. Write the main function to test the class.

Session 8:

16. Modify the above program and define all the member function outside the class.

17. Modify the above program and make it inline

18.



a. Create the above class Employee.
b. The 'calculate_pay' member function will calculate net pay for an employee:
   netpay = HRA + basic
   HRA = 25% of basic
c. The display function will display name, age and netpay.

19. Design a class Company which can have the following data:
    a. either name of the company or code of the company [int / char *]
    b. yearly turnover [int]
    c. type [char *] i.e. private/public limited company

    Now, call proper functions depending on company name or company code to show the information of the company.

Session 9:

20. Modify the above program and place the following constructor function within public area of the class:
    a. Employee();
    b. Employee(string, int, float);

21. Design the following class:

Time
hour minute second
putdata add subtract display

Create the above class Time and define required function to manipulate the time in proper way.

Session 10:

22. Design the following class:

Date
day month year
putdata add subtract display

Create the above data type 'Date'. The member functions of Date will perform the followings:-

subtract :- subtract two Dates and return number of year, month and days between them.

add :- Return a Date after adding some days with a Date.
Write the add function in the following ways:
Date add(int);
void add(Date, int);
Date add(Date);

Write a constructor: Date(Date &); It will copy one Dat e object to a new Date object.

23. Write a program to read a Matrix from the keyboard. Write a function to find the multiplication of that matrix.

Session 11:

24. Define a class 'employee' with variables Emp_Code, Name, Designation, Basic, DA, HRA and Total-Pay where Emp_Code is the slno, and Name, Designation and Basic are obtained from Keyboard input, DA is 40% of Basic and HRA is 20%, of Basic subjected to a minimum of Rs. 500/ -. Create an array of 10 objects of type 'employee'. Write a program for accepting d ata of 10 employees and print the details in the following format:

SLNO NAME DESIG BASICPAY DA HRA TOTPAY

25.

Vector
float : array
inputdata (array) multiply (int) display

Create the above class to represent a Vector (a series of float values).

Member function of that class will perform the followings: -

a. inputdata:- put values into the vector.
b. multiply:- multiply each elements of the vector.
c. display:- display all the elements of vector.

Session 12:

26. Add a new member function Vector copy(Vector) in the above class that will copy one object to another.

27. Design the following class:

Inventory
name stock price
input display

Create the above class. Other than two functions mentioned above write another function, which will automatically initialize the data member of the class at the time of instantiation.

Session 13:

28. Add a new function: void copy(Inventory, Inventory) in the above program that will copy 2nd object to the 1st argument.

29. Re-design the above Date & Time classes in such a way so that from the member function putdata() of the date object we can set the private d ata members of the time object, which is defined as a member of the date class.

Session 14:

30. Modify the above Inventory class, which can keep a count of the numbers of the objects of it instantiated.
    a. It can also assign an id to each of its object accord ing to the order of instantiation.
    c. Provide a function to display total number of objects created.
    d. Display order of destroying objects.
    e. Write a comment stating what conclusion can be drawn from Ques. No. d.

Session 15:

31. Practice few of the aforesai d programs

32. Using the function swap (for swapping two integers), which uses reference variables, write a program to sort a given array of n elements using Bubble sort.

33. There is a toll collection mechanism at Vidyasagar Bridge in Kolkata, where every car passing across is expected to pay a toll of Rs. 5/ - at a toll booth. Sometimes a car might speed through the booth without paying. The booth keeps track of the number of cars crossing the bridge, and the total money collected.
    Model the toll booth with a cl ass tollbooth. Two data items keep track of the numbers of cars, **ncar** of type unsigned int to keep track of no. of cars, and **total** of type double to keep track of money collected.
    A constructor initializes **ncar** and **total** to both zeros.
    A member function **goodCar** increments ncar and adds 5 to total.
    A member function **badCar** only increments ncar.
    A member function **display** displays the two totals.
    Write a test program for the above. The program should allow the user to push one key to count a **goodCar**, and another to count a **badCar**. Pressing ESCAPE key should cause the program to invoke display and exit.

34. Create a function called reverse() that takes two parameters, the first parameter, called str, is a pointer to a string that will be reversed upon return from the function. The second parameter is called count and it specifies how many characters of str to reverse. Give count a default value that when present tells reverse() to reverse the entire string. Write a main function, input the count and print the input as well as output string.

Session 16:

35. Provide post and pre increment operator of Date class to increment a date by 1 day.

36. Modify the subtract function of Date class in such a way that two date, say d1 and d2 can be subtracted.
    d3=d1-d2.

Session 17:

37. Create the following class Feet. Provide appropriate casting operator for converting (ft and inch treated as integer)

Feet
int ft int inch

    a. float to Feet
    b. Feet to float

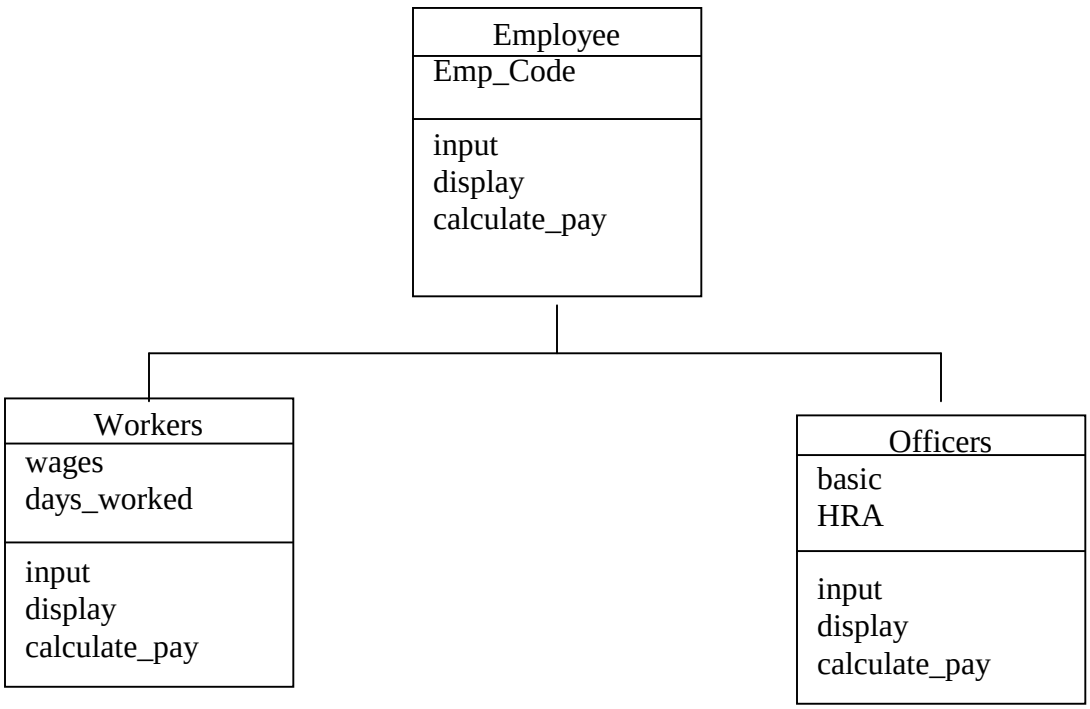
38. Create another class Meter. Provide a cast operator to convert Meter to Feet (Note: 1 Meter = 39.37 inch)

Meter
float mt float cm

39. Overload the insertion & extraction operator to input & display the object information.

Session 18:

40. Create the following class hierarchy:



In main() create objects of Workers and Officers class. After all the entries are completed show netpay. Provide appropriate constructor and destructor.

Session 19:

41. Develop a menu driven C++ program having more than two operands; the option as follows

1. Additions
2. Subtractions
3. Multiplications
4. Division
5. Print
6. Do you want to continue [Y/N]

42. Assume that Batsman is derived from the class called CricketPlayer, which consists of the following information
    Player name
    Country name
    Date of Birth
    No. of test played
    No. of one day played
    The Batsman class is now modified to contain the following information
    a. No. of innings
    b. No. of one day played
    c. No. of not outs in innings in test
    d. No. of not outs in innings in one day played
    e. The overloaded + operator add which adds two arrays element -wise.
    f. The overloaded – subtract which subtract two array element-wise, the right operand from the left.
    g. The overloaded == returns true if each element of both the array (each operand) is the same and returns false otherwise.

Session 20:

43. Consider a publishing company that markets both books and video cassette versions of certain subjects. Create a class publication that stores the title (string) and price (float) of a publication. From this class derive two classes:
    book, which adds a page count int type.
    Cassette, which adds a playing time in minutes float type.
    Add another base class sales that holds an array of three float numbers so that it can record the sales in Rupees of a particular publication for the last 3 months. Include a getdata() function to get three sales and a putd ata() function to display the sales. The book and cassette classes can be derived from both publication and sales. An object of class book or cassette inputs and outputs sales along with its other data. Write a main() function to create a book object and a cassette object and exercise their input/output capabilities.

Session 21:

44. Design a class Employee of an organization with members Emp _No, Name, Designation, BasicPay. Define a derived class 'Executive'.

    Write a member function 'calculate_pay', which will calculate net pay for an employee:

    netpay = HRA + basic
    HRA = 25% of basic (for Executives)
    HRA = 15% of basic (for other Employees)

    Override the calculate_pay() accordingly.

    The display function will display name, age and netpay.

Session 22:

45. Design another subclass Bearer derived from the above Employee class. It has a new data member: Department.

    Re-define the Employee class in a manner so that any employee must either be of type Executive or Bearer, but can't be a general Employee object.

Session 23:

46. Write a program, which will ask for a string from the user and save it in a text file by using insertion/extraction operator.

47. After saving the above text file, read the file and display the text.

48. Write a program, which opens an existing file (input from keyboard) and display its contents.

49. Write a program, which will accept keyboard input, saves it in a text file and display its contents.

50. Write a program in C++ that emulates the COPY command. The program should be invoked with two command line arguments, the source file and the destination file as follows:
    C:\> ccopy srcfile.xxx dstfile.yyy

Session 24:

51. Write a C++ code to read a text file and display the following information:
    h. Number of lines
    i. Number of words
    j. Number of 3 letter words.
52. A file contains a list of telephone numbers in the following form:
    Sudeshna 25644554
    Abhijit 26634412
    The names are of only one word and the names and telephone numbers are separated by white-space. Write a program to display entries serially.

53. Write a program that will create a data file containing the list of telephone numbers given in the above problem. Use a class object to store each set of data.

54. Write an interactive menu-driven program that will access the file created in the above program and implements the following tasks.
    k. Determine the telephone number of the specified person
    l. Determine the name if a telephone number is known
    m. Update the telephone number, whenever there is a change.

Session 25:

55. Write an interactive program in C++, which will run as follows.
    Enter the option-
    1. Open
    2.Read
    3.Write
    4.Search

    If you choose 1 then a file named will be asked (say TESTFILE).
    if you choose 2 then the file will be read
    if you choose 3 then the file will be written or modified.
    If you choose 4 then the file will be opened and will ask for a some text to search and show the result whether the entered text exists in the file or not.

    Incorporate appropriate error handling mechanisms so that in case of the absence of the given file, the program can display proper error messages.