

ASSIGNMENT SHEET

WITHOUT USING OBJECT AND CLASSES

1. Write a program to calculate the sum of two numbers using function.
2. Write a program to calculate the area of circle, rectangle and triangle using function overloading.
3. Write a program to add numbers using command line argument programs.
4. Write a program to print all prime numbers and print the sum.
5. Write a program to find the nature of a roots of a equation $ax^2+bx+c=0$, where a,b,c are given input? Find also the roots.

OBJECT, CLASSES AND CONSTRUCTOR

6. Create a class Big and define two – member functions One function will take two integers data item from the console and by use of another member function that will calculate the biggest out of two and display the result.
7. Imagine a tollbooth with a class called to tollbooth. The two data items are of type **unsigned int** to hold the total number of cars and type **double** to hold the total money collected. A constructor initializes both these to zero. A member function called **Paying_Car()** increments the car total and adds Rs. 2.50 to the cash total. Another function called **Non_Paying_Car()** increments the car total but adds nothing to the cash total. Finally a member function called **display()** shows the two totals. Include a main () program to test this class. The program should allow the user to push one key to count a paying cars and another to count non-paying cars. At end it should print out the total cars and total cash collected and then exit.
8. Five candidates contest an election. The candidates are numbered 1 to 5 and marking the candidate number on the ballot paper does the voting. Write a program 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 ballots.
9. An electricity board charges the following rates to domestic users to discourage large consumption of energy.
For the first 100 units – 40 P per unit
For the next 200 units –50 P per unit
Beyond 300 units –60 P per unit
All users are charged a minimum of Rs. 100 /-. If the total cost is more than Rs. 250/- then an additional surcharge of 15% is added. Write a program to read the names of users and numbers of units consumed and print out the charges with names.
10. Define a class to represent a bank account of a customer including a member variables Name of the depositor, Account number, type of account, balance amount in the account and the member functions to assign initial values of member variables, to deposit an amount, to withdraw an amount after checking, to display name and balance. Write a main program to test the program for n number of customers.

11. Create a class called **user_time** that has separate integer members for hours, minutes and seconds. One constructor should initialize this data to 0, and another should initialize it to fixed values. A member function should display it in HH:MM:SS format. The final two member functions should add and subtract two objects of time passed as arguments. A main () program should create two initialized **user_time** objects. Then it should add the two initialized together, leaving the result in the third **user_time** object. Finally it should display the value of third variable.
12. Create a class called **employee** that contains a name and an employee number. Include a member function called **appointment()** to get data from the user for insertion into the object, and another function called **show_employee()** to display the data. Assume the name has no embedded blanks. Write a main () program and create an array of type employee, and invite the user to input data for up to 5 employees. Finally, it should print out the data for all the employees.
13. Create two classes DM and DB, which store the value of distances. DM stores distances in meters and centimeters and DB in feet and inches. Write a program that can read values for the class object and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results may be a DM object or DB object, depending on the units in which results are required. The display should be in the format of feet and inches or meters and centimeters depending on the object on display.
14. A bookshop 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, an appropriate message is displayed. If it is, then the system displays the book details and requests for the number of copies required, If the requested copies 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 operators in constructors to allocate memory space required.
15. Create a class HugeInteger that uses 40 elements array of digits to store integer as large as 20 digits. Provide method input HugeInteger, output HugeInteger, addHugeInteger, multiplyHugeInteger and modulusHugeInteger.
16. Define a stack uses one liner array and counter to notice number of item in stack. Define a member function corresponding to PUSH and POP operations including overflow and underflow situation relevantly.
17. Write down a program on C++ to define a class Matrix that uses a 2D-array and two counters RowSize and ColSize to hold size of the matrix. Define member functions, which perform.
 1. Matrix multiplication
 2. Matrix addition
18. Write a program in C++ to read the information like name, age, birthday, sex, and address of students. Write functions to create, modify and delete the information of any student and also to print the information of the students.

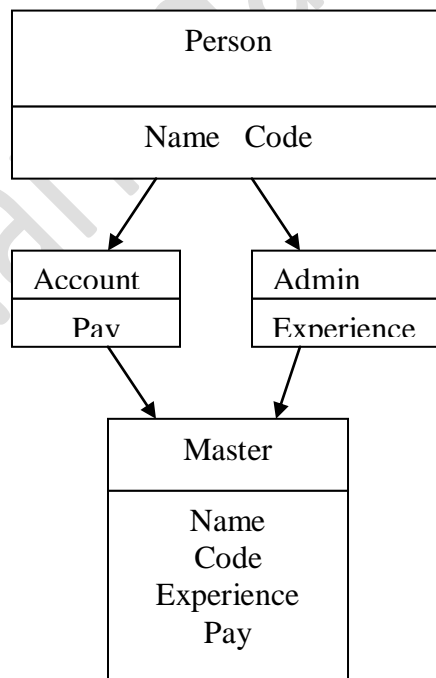
19. Write a program in C++ to read two strings of different lengths and to test whether one string is a sub-string of the other or not.
20. Define a class country that stores the name of the country, population and its area. Using that class write a program that reads a set of countries and prints.
 1. The country with largest area
 2. The country with largest population
 3. The country with largest population density.
21. Implement a class Address. An address has House number, a street name and optional apartment number, a city and postal code. Supply two constructors one with an apartment number and one without apartment number. Supply a print function that prints the addresses with a street number on one line and the city. State and postal code on another line.
22. Create a class called DAY that has separate integer member day, month and year. One constructor should initialize these data to zero and another should initialize to specific values. Write a main () function to read two dates and find their difference in terms of the number of days and display it.
23. Write a C++ program using array of objects which store player name match played and run scored for given number of players involve member func Hons to obtain player with maximum match played, maximum run scored and maximum average.
24. Design the following program using Call by Reference ad Return by Reference concepts, Define a class item which contains following information item name, item cost, name of the manufacturing company, date of manufacturing. Then return the reference of that item for displaying which contains the maximum product cost.

INHERITANCE

25. Implement a base class **Person**. Derive classes **Student** and **Instructor** from **Person**. A Person has a name and a birthday. A student has a batch,course and a Instructor has a salary. Write the class definitions, the constructor and the member function print () for all classes.
26. Derive a class **Manager** from **Employee**. Add a data field named **Department** of type **String**, supply **print ()** method that prints the Manager's name , department and salary. Derive a class **Executive** form Manager. Supply function **print ()** that prints the string **Executive** followed by the information stored in **Manager** base object.
27. Define a class **Education** that holds two pieces of information, namely highest educational qualification and highest professional qualification. These class should be inherited by the classes **Teacher** and **Officer**. Display all the objects information created with respect to either of the above classes in a descending order of educational / professional qualification.
28. Implement a base class **Account** and derived classes **Savings** and **Checking**. In the base class, supply member function deposit and withdraw. Provide a function daily-interest that computes and adds daily-interest. For calculations, assume that every month has 30 days. Checking accounts yield interest of 5% monthly on balances over Rs. 1000/-. Savings

account yield interest of 6% on the entire balance. Write a driver program that makes a month's worth of deposits and withdraws and calculate the interest everyday.

29. Write a base class **Worker** and derived classes **HourlyWorker** and **SalariedWorker**. Every worker has a name and a salary rate. Write a virtual function **ComputePay** (in hour) that computes weekly pay for every worker. An hourly worker gets paid the hourly wages for the actual number of hours worked. The hours are at most 40 per week. If it is greater than 40, the worker gets 1.5 times of the hourly rate for excess hour. The salaried worker gets paid the hourly wage for 40 hours, no matter what the actual number of hours is .
30. A publishing company markets both books and the playing time in minutes for the cassettes. Design a C++ program using derived classes to add books and cassettes. Display the stock and find out whether a particular book or its cassette is in stock or not.
31. Design and implement classes **Politician**, **MP** and **MLA**. **MP** and **MLA** are derived classes of **Politician**. **Politician** is a derived class from **Person** (Name and Phone Number). A **Politician**, in addition to name and phone number, has a party and a state. Class **MP** has a rank LS / RS. Class **MLA** has in addition one identification number. Your design will include methods to initialize, access and filing in .
32. Consider the following Net work of classes as mentioned :
The class **Master** derives information from both **Account** and **Admin** classes which in turn derive information from the class **Person**. Define all the four classes and write a program to create, update and display the information contained in **Master** objects.



OVERLOADING

33. Write a program to over load the operator + which will concatenate two numbers of any string values.

34. Write a program that overload the operator * where A is a 2D matrix. Use the expression as: 1) A^2 , 2) A^*A , 3) 2^*A .
35. Create a class COMPLEX that will contain complex numbers, Use operator overloading to create addition, subtraction and multiplication operators, which will operate on COMPLEX class.
36. Define two classes Polar and rectangle to represent points in the **polar** and **rectangle** systems. Use conversion routines to convert from one system to the other.
37. Write a C++ program to construct a class String which has one string and length of that string as data members. Overload the following operators :
 - a) '=' for string copy,
 - b) '==' for string comparison
 - c) '+' for string concatenation.
38. C++ operators such as >>, which reads input from the keyboard, converts the sequences to digit into number. Write a program that emulates this behavior. It should allow the user to type up six digits, then display the resulting the number as a type of long integer. The individual digits should be read using getch(). For constructing the number multiply the partial result by 10 then add new digits.
39. a class polar which describes a point in the plane using polar co- ordinates radius and angle over load the operator + to add two objects of polar. This requires first conversion of points to rectangular co-ordinates then adding the corresponding rectangular co-ordinates and finally converting the result back into polar co-ordinates. This conversion formulæ are as follows:
 $x=r*\cos(a)$, $a=\text{atan}(x/y)$ $y=r*\sin(a)$, $r=\text{sqrt}(x*x+y*y)$

TEMPLATES

40. Write a program to add two numbers using Template Functions.
41. Designe a Template class where two variables are template type and input values from main function for integer and floating. The operation performed that to convert temperature from centigrate to fahrenheit.
42. write a program that will open a file and write some contents into it. Display the contents in reverse order as output.
43. Create a master file containing the information about various persons with filed Name, Age , Profession, DOB. Then store these information in a file. Then scan from the file and print information about persons in teaching profession.
44. Sort different data types by help of template.

FILES

45. Write a program to add, list ,modify and delete values from the data file using class and objects. The file structure is Employee(emp_code,emp_name,designation,salary)
46. Write a program to read data from a data file and count number of words in it.
47. Write a program to copy records from one file to other using command line arguments.

END