1. Write a function “perfect()” that determines if parameter number is a perfect number. Use this function in a program that determines and prints all the perfect numbers between 1 and 1000.  
   [An integer number is said to be “perfect number” if its factors, including 1(but not the number itself), sum to the number. E.g., 6 is a perfect number because 6=1+2+3].
2. Write a structure to store the names, salary and hours of work per day of 10 employees in a company. Write a program to increase the salary depending on the number of hours of work per day as follows and then print the name of all the employees along with their final salaries.

|  |  |  |  |
| --- | --- | --- | --- |
| Hours of work per day | 8 | 10 | >=12 |
| Increase in salary | $50 | $100 | $150 |

### Let us work on the menu of a library. Create a structure containing book information like accession number, name of author, book title and flag to know whether book is issued or not.

### Create a menu in which the following can be done.

### 1 - Display book information 2 - Add a new book 3 - Display all the books in the library of a particular author 4 - Display the number of books of a particular title 5 - Display the total number of books in the library 6 - Issue a book (If we issue a book, then its number gets decreased by 1 and if we add a book, its number gets increased by 1)

1. Create two classes named Mammals and MarineAnimals. Create another class named BlueWhale which inherits both the above classes. Now, create a function in each of these classes which prints "I am mammal", "I am a marine animal" and "I belong to both the categories: Mammals as well as Marine Animals" respectively. Now, create an object for each of the above class and try calling  
   1 - function of Mammals by the object of Mammal  
   2 - function of MarineAnimal by the object of MarineAnimal  
   3 - function of BlueWhale by the object of BlueWhale  
   4 - function of each of its parent by the object of BlueWhale
2. We want to store the information of different vehicles. Create a class named Vehicle with two data member named mileage and price. Create its two subclasses  
   \*Car with data members to store ownership cost, warranty (by years), seating capacity and fuel type (diesel or petrol).  
   \*Bike with data members to store the number of cylinders, number of gears, cooling type(air, liquid or oil), wheel type(alloys or spokes) and fuel tank size(in inches) Make another two subclasses Audi and Ford of Car, each having a data member to store the model type. Next, make two subclasses Bajaj and TVS, each having a data member to store the make-type.  
   Now, store and print the information of an Audi and a Ford car (i.e. model type, ownership cost, warranty, seating capacity, fuel type, mileage and price.) Do the same for a Bajaj and a TVS bike.
3. Create a class named 'Rectangle' with two data members 'length' and 'breadth' and two functions to print the area and perimeter of the rectangle respectively. Its constructor having parameters for length and breadth is used to initialize the length and breadth of the rectangle. Let class 'Square' inherit the 'Rectangle' class with its constructor having a parameter for its side (suppose s) calling the constructor of its parent class. Print the area and perimeter of a rectangle and a square.
4. Write a Program which creates & uses array of object of a class.( for eg. implementing the list of Managers of a Company having details such as Name, Age, etc..).
5. Write a Program illustrating how the constructors are implemented and the order in which they are called when the classes are inherited. Use three classes named alpha, beta, gamma such that alpha,beta are base class and gamma is derived class inheriting alpha & beta.