

Topics in this lab:

1. Parameterized Constructors
2. Overloading Constructors
3. Destructors
4. Pointer to objects
5. This keyword

Section A

1. Briefly describe the purpose of the constructor
2. Briefly describe the purpose of the destructor
3. A member function that is never declared with a return data type, but they have arguments is
 - a) The constructor
 - b) The destructor
 - c) Both the constructor and the destructor
 - d) Neither the constructor nor the destructor
4. A member function that is never declared with a return data type and can never have arguments is
 - a) The constructor
 - b) The destructor
 - c) Both the constructor and the destructor
 - d) Neither the constructor nor the destructor
5. Destructor function names always start with
 - a) A number
 - b) Tilde character (~)
 - c) A data type name
 - d) None of the above
6. A constructor that requires no arguments is called
 - a) A default constructor
 - b) An overloaded constructor
 - c) A null constructor
 - d) None of the above

7. True or False Constructors are never declared with a return data type
8. True or False Destructors are never declared with a return type
9. True or False Destructors may take any number of arguments

Problem 1:

Write a class named **Car** that has the following member variables:

1. yearModel: An int that holds the car's year model.
2. make: A string that holds the make of the car.
3. speed: An int that holds the car's current speed.

In addition, the class should have the following constructor and other member functions:

1. Default Constructor: all variables should be set to 0.
2. Parameterized Constructor: it should accept the car's model and make as arguments and assign 0 to the speed member variables. These values should be assigned to the object's yearModel and make member variables.
3. Destructor: it should have a cout statement "The object has been destroyed".
4. Accessors and Mutators Functions: write an accessor and mutator function for each member variable.
5. Accelerate Function: it should add 5 to the speed member variable each time it is called.
6. Brake Function: it should subtract 5 from the speed member variable each time it is called.

Demonstrate the class in a program that:

1. Create an object named car1 using the parameterized constructor (yearModel = 2006, make = Porsche). Then call the accelerate function five times. After each call, get the current speed of the car, and display it. Then, call brake function five times. After each call, get the current speed of the car and display it.
2. Create an object named car2 using the default constructor.

Solving steps

a) Read the problem carefully and answer the following questions:

Q1: what is the input?

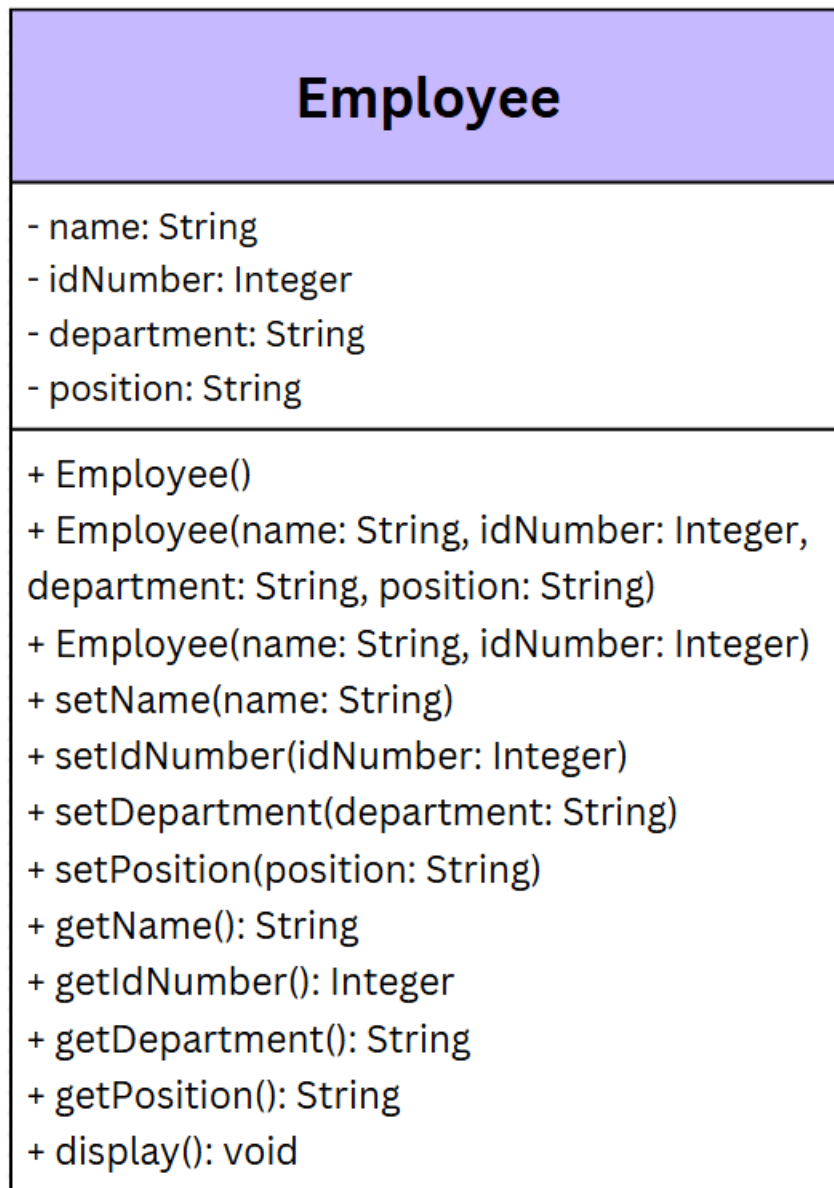
Q2: what is the output?

Q3: What is the relation between input and output?

Some important notes about the output format:

- 1- The class Car needs to be carefully designed (what is private and what is public)
- 2- The mutator (set) and accessor (get) functions should be designed
- 3- The operation functions should be also carefully coded (Accelerate, Brake)

Problem 2: Interpret this diagram to a C++ program.



Example of the run

Name	ID Number	Department	Position
Susan Meyers	47899	Accounting	Vice president
Mark Jones	39119	IT	Programmer
Joy Rogers	81774	Manufacturing	Engineer