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| Classes sample questions |
| Write a class called "Rectangle" that has private member variables for its width and height, and public member functions for setting and getting those values, as well as a function for calculating the rectangle's area.  Create a class called "Car" that has private member variables for its make, model, and year, and public member functions for setting and getting those values. Also include a function for starting the car and a function for stopping the car.  Write a class called "BankAccount" that has private member variables for its account number, balance, and owner's name, and public member functions for setting and getting those values, as well as functions for depositing and withdrawing money from the account.  Create a class called "Person" that has private member variables for its name, age, and address, and public member functions for setting and getting those values. Also include a function for printing out the person's information.  Write a class called "Circle" that has private member variables for its radius and circumference, and public member functions for setting and getting those values, as well as a function for calculating the circle's area.  Create a class called "Student" that has private member variables for its name, age, and grade point average, and public member functions for setting and getting those values. Also include a function for calculating the student's letter grade based on their GPA.  Write a class called "Employee" that has private member variables for its name, ID number, and salary, and public member functions for setting and getting those values, as well as a function for giving the employee a raise. |

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| Question: Write a class called "Rectangle" that has private member variables for its width and height, and public member functions for setting and getting those values, as well as a function for calculating the rectangle's area. |
| Solution |
| #include <iostream>  using namespace std;  class Rectangle {  private:  int width;  int height;  public:  void setWidth(int w) {  width = w;  }  int getWidth() const {  return width;  }  void setHeight(int h) {  height = h;  }  int getHeight() const {  return height;  }  int getArea() const {  return width \* height;  }  };  int main() {  // create a Rectangle object  Rectangle rect;  // set the width and height of the rectangle  rect.setWidth(5);  rect.setHeight(10);  // print the width, height, and area of the rectangle  cout << "Width: " << rect.getWidth() << endl;  cout << "Height: " << rect.getHeight() << endl;  cout << "Area: " << rect.getArea() << endl;  return 0;  } |
| Explanation |
| This program creates a Rectangle object, sets its width and height using the setWidth and setHeight methods, and then prints out the width, height, and area of the rectangle using the getWidth, getHeight, and getArea methods, respectively. The output of the program should be:  Width: 5  Height: 10  Area: 50 |

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| Question: Create a C++ class called "Car" that has private member variables for its make, model, and year, and public member functions for setting and getting those values. Also include a function for starting the car and a function for stopping the car. |
| Solution |
| #include <iostream>  using namespace std;  class Car {  private:  string make;  string model;  int year;  bool isRunning;  public:  // Constructor to initialize object  Car(string carMake, string carModel, int carYear) {  make = carMake;  model = carModel;  year = carYear;  isRunning = false;  }  // Getter and setter functions for make, model, and year  void setMake(string carMake) {  make = carMake;  }  string getMake() const {  return make;  }  void setModel(string carModel) {  model = carModel;  }  string getModel() const {  return model;  }  void setYear(int carYear) {  year = carYear;  }  int getYear() const {  return year;  }  // Function to start the car  void start() {  isRunning = true;  cout << "The " << year << " " << make << " " << model << " is now running." << endl;  }  // Function to stop the car  void stop() {  isRunning = false;  cout << "The " << year << " " << make << " " << model << " has been stopped." << endl;  }  };  int main() {  // Create a car object and start the car  Car myCar("Toyota", "Camry", 2021);  myCar.start();  // Print the make, model, and year of the car  cout << "Make: " << myCar.getMake() << endl;  cout << "Model: " << myCar.getModel() << endl;  cout << "Year: " << myCar.getYear() << endl;  // Stop the car  myCar.stop();  return 0;  } |
| Explanation |
| This program creates a Car object and starts the car using the start method. It then prints out the make, model, and year of the car using the getMake, getModel, and getYear methods, respectively. Finally, it stops the car using the stop method. The output of the program should be:  Copy code  The 2021 Toyota Camry is now running.  Make: Toyota  Model: Camry  Year: 2021  The 2021 Toyota Camry has been stopped. |

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| Question: Write a C++ class called "BankAccount" that has private member variables for its account number, balance, and owner's name, and public member functions for setting and getting those values, as well as functions for depositing and withdrawing money from the account. Test with main method |
| Solution |
| #include <iostream>  #include <string>  using namespace std;  class BankAccount {  private:  int accountNumber;  double balance;  string ownerName;    public:  void setAccountNumber(int number) {  accountNumber = number;  }  int getAccountNumber() {  return accountNumber;  }  void setBalance(double amount) {  balance = amount;  }  double getBalance() {  return balance;  }  void setOwnerName(string name) {  ownerName = name;  }  string getOwnerName() {  return ownerName;  }  void deposit(double amount) {  balance += amount;  }  void withdraw(double amount) {  if (balance >= amount) {  balance -= amount;  } else {  cout << "Insufficient funds" << endl;  }  }  };  int main() {  BankAccount account;    account.setAccountNumber(12345);  account.setOwnerName("John Smith");  account.setBalance(1000.0);    cout << "Account number: " << account.getAccountNumber() << endl;  cout << "Owner's name: " << account.getOwnerName() << endl;  cout << "Balance: $" << account.getBalance() << endl;    account.deposit(500.0);  cout << "New balance after deposit: $" << account.getBalance() << endl;    account.withdraw(200.0);  cout << "New balance after withdrawal: $" << account.getBalance() << endl;    account.withdraw(1500.0);    return 0;  } |
| Explanation |
| In this implementation, the private member variables are accountNumber, balance, and ownerName. The public member functions include getters and setters for each of these variables, as well as functions for depositing and withdrawing money from the account. |

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| Question: Create a class called "Person" that has private member variables for its name, age, and address, and public member functions for setting and getting those values. Also include a function for printing out the person's information. |
| Solution |
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| Explanation |
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