Trạng thái	Đã xong
Bắt đầu vào lúc	Thứ Ba, 11 tháng 2 2025, 1:45 PM
Kết thúc lúc	Chủ Nhật, 23 tháng 2 2025, 11:46 PM
Thời gian thực hiện	12 Các ngày 10 giờ
Điểm	5,00/5,00
Điểm	**10,00** trên 10,00 (**100**%)

Câu hỏi **1**

Đúng

Đạt điểm 1,00 trên 1,00

In the coordinate plane, we have class Point to store a point with it's x-y coordinate.

Your task in this exercise is to implement functions marked with /* * STUDENT ANSWER */.

Note: For exercises in Week 1, we have #include <bits/stdc++.h> and using namespace std;

For example:

Test	Result

`Point A(2, 3);`
`cout << A.getX() << " " << A.getY();`
	2 3

`Point A(2, 3);`
`Point B(1, 1);`
`cout << pow(A.distanceToPoint(B), 2);`
	5

Answer: (penalty regime: 0 %)

Reset answer

```
class Point
{
private:
    double x, y;

public:
    Point()
    {
        /*
         * STUDENT ANSWER
         * TODO: set zero x-y coordinate
         */
         this -> x = 0.0;
         this -> y = 0.0;
    }

    Point(double x, double y)
    {
        /*
         * STUDENT ANSWER
         */
         this -> x = x;
         this -> y = y;
    }

    void setX(double x)
    {
        /*
         * STUDENT ANSWER
         */
         this -> x = x;
    }

    void setY(double y)
    {
        /*
         * STUDENT ANSWER
         */
         this -> y = y;
    }

    double getX() const
    {
        /*
         * STUDENT ANSWER
         */
         return this -> x;
    }

    double getY() const
    {
        /*
```

	Test	Expected	Got	

✓	`Point A(2, 3);`
	`cout << A.getX() << " " << A.getY();`
		2 3	2 3	✓

✓	`Point A(2, 3);`
	`Point B(1, 1);`
	`cout << pow(A.distanceToPoint(B), 2);`
		5	5	✓

Passed all tests! ✓

Đúng

Marks for this submission: 1,00/1,00.

Câu hỏi **2**

Đúng

Đạt điểm 1,00 trên 1,00

In the coordinate plane, a circle is defined by center and radius.

Your task in this exercise is to implement functions marked with /* * STUDENT ANSWER */.

Note: you can use implemented class Point in *previous question*

For example:

Test	Result

`Circle A;`
`A.printCircle();`
	`Center: {0.00, 0.00} and Radius 0.00`

Answer: (penalty regime: 0 %)

Reset answer

```
class Point
{
private:
    double x, y;

public:
    Point()
    {
        /*
         * STUDENT ANSWER
         * TODO: set zero x-y coordinate
         */
         this -> x = 0.0;
         this -> y = 0.0;
    }

    Point(double x, double y)
    {
        /*
         * STUDENT ANSWER
         */
         this -> x = x;
         this -> y = y;
    }

    void setX(double x)
    {
        /*
         * STUDENT ANSWER
         */
         this -> x = x;
    }

    void setY(double y)
    {
        /*
         * STUDENT ANSWER
         */
         this -> y = y;
    }

    double getX() const
    {
        /*
         * STUDENT ANSWER
         */
         return this -> x;
    }

    double getY() const
    {
```

	Test	Expected	Got	

✓	`Circle A;`
	`A.printCircle();`
		`Center: {0.00, 0.00} and Radius 0.00`	`Center: {0.00, 0.00} and Radius 0.00`	✓

Passed all tests! ✓

Đúng

Marks for this submission: 1,00/1,00.

Câu hỏi **3**

Đúng

Đạt điểm 1,00 trên 1,00

In a game, we have class `Character` to store characters' data.
The class `Character` is declared as below:

```
class Character {
protected:
    int hp;
    int x;
    int y;
public:
    // Constructor: set the values of x and y and hp to 0
    Character();

    // Constructor: set the values of hp, x and y to each parameter
    Character(int hp, int x, int y);

    // Set and get hp
    int getHp();
    void setHp(int hp);

    // Set and get x
    int getX();
    void setX(int x);

    // Set and get y
    int getY();
    void setY(int y);

    // Get Manhattan distance to other character
    int getManhattanDistTo(Character* other);
};
```

Your task is to define the constructors and the methods of the class.

Note:
In this task, `iostream` library has been included, and `namespace std` is being used. No other libraries are allowed.

For example:

Test	Result

`Character ch1(100, 3, 6);`
`cout << ch1.getHp() << " " << ch1.getX() << " " << ch1.getY();`
	`100 3 6`

Answer: (penalty regime: 0 %)

Reset answer

```
// Default constructor
Character::Character() {
    hp = 0;
    x = 0;
    y = 0;
}

// Parameterized constructor
Character::Character(int hp, int x, int y) {
    this->hp = hp;
    this->x = x;
    this->y = y;
}

// Getter for hp
int Character::getHp() {
    return hp;
}

// Setter for hp
void Character::setHp(int hp) {
    this->hp = hp;
}

// Getter for x
int Character::getX() {
    return x;
}

// Setter for x
void Character::setX(int x) {
    this->x = x;
}

// Getter for y
int Character::getY() {
    return y;
}

// Setter for y
void Character::setY(int y) {
    this->y = y;
}

// Calculate Manhattan distance
int Character::getManhattanDistTo(Character* other) {
    return abs(x - other->x) + abs(y - other->y);
}

```

	Test	Expected	Got	

✓	`Character ch1(100, 3, 6);`
	`cout << ch1.getHp() << " " << ch1.getX() << " " << ch1.getY();`
		100 3 6	100 3 6	✓

✓	`Character ch2;`
	`cout << ch2.getHp() << " " << ch2.getX() << " " << ch2.getY();`
		0 0 0	0 0 0	✓

✓	`Character* ch31 = new Character(100, 1, 2);`
	`Character* ch32 = new Character(100, -3, 4);`
	`cout << ch31->getManhattanDistTo(ch32);`
	`delete ch31;`
	`delete ch32;`
		6	6	✓

✓	`Character ch4;`
	`ch4.setX(4);`
	`cout << ch4.getX();`
		4	4	✓

✓	`Character ch5;`
	`ch5.setY(5);`
	`cout << ch5.getY();`
		5	5	✓

✓	`Character ch6;`
	`ch6.setHp(6);`
	`cout << ch6.getHp();`
		6	6	✓

Passed all tests! ✓

Đúng

Marks for this submission: 1,00/1,00.

Câu hỏi **4**

Đúng

Đạt điểm 1,00 trên 1,00

Hoang is a K19 student studying at Bach Khoa University. He plans to write a book management software for the library. In the class design, Hoang has designed the class Book as follows:

```
class Book
{
private:
    char* title;
    char* authors;
    int publishingYear;
public:
   // some method
}
```

Your task in this exercise is to implement functions marked with /* * STUDENT ANSWER   */.

Note: For exercises in Week 2, we have #include <bits/stdc++.h> and using namespace std;

For example:

Test	Result

`Book book1("Giai tich 1","Nguyen Dinh Huy",2000);`
`book1.printBook();`
	`Giai tich 1`
	`Nguyen Dinh Huy`
	`2000`

`Book book1("Giai tich 1","Nguyen Dinh Huy",2000);`
`Book book2 = book1;`
`book2.printBook();`
	`Giai tich 1`
	`Nguyen Dinh Huy`
	`2000`

Answer: (penalty regime: 0 %)

Reset answer

```
#include <bits/stdc++.h>
using namespace std;

class Book {
private:
    char* title;
    char* authors;
    int publishingYear;

public:
    // Default constructor
    Book() {
        title = nullptr;
        authors = nullptr;
        publishingYear = 0;
    }

    // Parameterized constructor
    Book(const char* title, const char* authors, int publishingYear) {
        this->title = new char[strlen(title) + 1];
        strcpy(this->title, title);

        this->authors = new char[strlen(authors) + 1];
        strcpy(this->authors, authors);

        this->publishingYear = publishingYear;
    }

    // Copy constructor (Deep Copy)
    Book(const Book& book) {
        title = new char[strlen(book.title) + 1];
        strcpy(title, book.title);

        authors = new char[strlen(book.authors) + 1];
        strcpy(authors, book.authors);

        publishingYear = book.publishingYear;
    }
    }

    // Destructor to release memory
    ~Book() {
        delete[] title;
        delete[] authors;
    }

    // Setter for title
    void setTitle(const char* title) {
        delete[] this->title; // Free existing memory
        this->title = new char[strlen(title) + 1];
        strcpy(this->title, title);
    }

```

	Test	Expected	Got	

✓	`Book book1("Giai tich 1","Nguyen Dinh Huy",2000);`
	`book1.printBook();`
		Giai tich 1
		Nguyen Dinh Huy
		2000
			Giai tich 1
			Nguyen Dinh Huy
			2000
				✓

✓	`Book book1("Giai tich 1","Nguyen Dinh Huy",2000);`
	`Book book2 = book1;`
	`book2.printBook();`
		Giai tich 1
		Nguyen Dinh Huy
		2000
			Giai tich 1
			Nguyen Dinh Huy
			2000
				✓

Passed all tests! ✓

Đúng

Marks for this submission: 1,00/1,00.

Câu hỏi **5**

Đúng

Đạt điểm 1,00 trên 1,00

1. In the toy store, all toy has a price. Car toy has a price and color, Puzzle toy has a price and size. We have to implement class CarToy and class PuzzleToy which inherit from class Toy.
2. class ToyBox has a pointer array to store a list of toys (up to 5 items including car and puzzle) and number of items in the box.

Your task is to implement two function addItem(…) in class ToyBox. If successfully added, the function returns the current number of toys in the box. If the box is full, return -1.

For example:

Test	Result

`CarToy car(20000,red);`
`PuzzleToy puzzle(30000,small);`
`car.printType();`
`puzzle.printType();`
	`This is a car toy`
	`This is a puzzle toy`

`CarToy car(20000,red);`
`PuzzleToy puzzle(30000,small);`
 	
`ToyBox box;`
`box.addItem(car);`
`box.addItem(puzzle);`
`box.printBox();`
	`This is a car toy`
	`This is a puzzle toy`

`Toy* toy = new CarToy(30000,red);`
`toy->printType();`
	`This is a car toy`

Answer: (penalty regime: 0 %)

Reset answer

```

enum Color { red, green, blue };
enum Size { small, medium, big };

class Toy
{
protected:
    double price;

public:
    Toy(double price) : price(price) {}
    virtual ~Toy() {} // Virtual destructor to ensure correct cleanup
    virtual void printType() = 0;
    friend class ToyBox;
};

class CarToy : public Toy
{
private:
    Color color;

public:
    CarToy(double price, Color color) : Toy(price), color(color) {}

    void printType() override
    {
        cout << "This is a car toy\n";
    }

    friend class ToyBox;
};

class PuzzleToy : public Toy
{
private:
    Size size;
```

```

public:
    PuzzleToy(double price, Size size) : Toy(price), size(size) {}

    void printType() override
    {
        cout << "This is a puzzle toy\n";
    }

    friend class ToyBox;
};

class ToyBox
{
private:
    Toy* toyBox[5];
```

	Test	Expected	Got	

✓	`CarToy car(20000,red);`
	`PuzzleToy puzzle(30000,small);`
	`car.printType();`
	`puzzle.printType();`
		This is a car toy
		This is a puzzle toy
			This is a car toy
			This is a puzzle toy
				✓

✓	`CarToy car(20000,red);`
	`PuzzleToy puzzle(30000,small);`
	
	`ToyBox box;`
	`box.addItem(car);`
	`box.addItem(puzzle);`
	`box.printBox();`
		This is a car toy
		This is a puzzle toy
			This is a car toy
			This is a puzzle toy
				✓

✓	`Toy* toy = new CarToy(30000,red);`
	`toy->printType();`
		This is a car toy	This is a car toy	✓

Passed all tests! ✓

Đúng

Marks for this submission: 1,00/1,00.