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FACULTY OF INFORMATION TECHNOLOGY
SOFTWARE ENGINEERING DEPARTMENT
ADVANCED PROGRAM IN COMPUTER SCIENCE
COURSE: **PROGRAMMING SYSTEMS**
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WEEK 07

COMPOSITE

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1 Exercises

Please use class string to store string and class vector to store array in this lab.

1.1 Exercise 01: Machine

A machine is built from a number of components. There are 2 types of components: single components and complex components. A component has a unique ID. Two data members of a single component you should consider are weight and price. A complex component contains a number of components.

You are asked to draw a class diagram and implement a console application to do the following tasks:

1. Allow user to input info of a machine.
2. Calculate the total weight of a machine. Weight of machine = weight of all its components
3. Calculate the price of a machine. Price of a machine = price of all its components * 2.

1.2 Exercise 02: File System

A drive contains a number of files and folders. A file has name, size, read-only attribute and hidden attribute. A folder contains a number of files and folders. Size of a folder = size of all its files and its subfolders.

You are asked to draw a class diagram and implement a file system so that the following main function runs properly.

```
void main()
{
	CFolder C("C");
	CFolder System("System");
	CFolder Windows("Windows");
	CFile a_txt("a.txt", 123);
	CFile b_doc("b.doc", 456);

	System.add(&a_txt);
	Windows.add(&b_doc);
	C.add(&System);
	C.add(&Windows);

	cout << "Noi dung o dia C ->" << endl;
	C.print(0); // print sub-files or folders? 1/0

	CItem* p = C.removeByName("System");
```

```
	cout << "Noi dung o dia C sau khi xoa thu muc System ->" <<
endl;
	C.print(0);

	p = C.findByName("b.doc");
	if (p != NULL)
	{
		cout << "Tim thay tap tin b.doc trong o dia C" <<
endl;
	}
	else
	{
		cout << "Khong tim thay tap tin b.doc trong o dia C"
<< endl;
	}

	p = C.findByName("a.txt");
	if (p != NULL)
	{
		cout << "Tim thay tap tin a.txt trong o dia C" <<
endl;
	}
	else
	{
		cout << "Khong tim thay tap tin a.txt trong o dia C"
<< endl;
	}

	p = C.findByName("Windows");
	if (p != NULL)
	{
		cout << "Tim thay thu muc Windows trong o dia C, noi
dung thu muc Windows ->" << endl;
		p->setHidden(true,true); // set HIDDEN to folder p and
all its items
		p->print(0);
		p->setHidden(false,true); // set UN-HIDDEN to folder p
and all its items
	}
	else
	{
		cout << "Khong tim thay thu muc Windows trong o dia C"
<< endl;
	}
}
```

1.3 Exercise 03

Design a class that we can only create at most 1 instance of this class.