

**FACULTY OF COMPUTING
& INFORMATION TECHNOLOGY**
KING ABDULAZIZ UNIVERSITY



**كلية الحاسبات
وتقنية المعلومات**
جامعة الملك عبدالعزيز

FCIT Computer Lab

Assignment 2

CPCS203 Programming-II - Second Semester 2023

Delivery Date: Saturday 05/02/2023 – 11 PM



Instructions

- This program must ONLY be submitted on the Blackboard!
- This project worth 10% of the overall module marks (100%).
- NO assignment will be accepted after 11:59 pm for any reason
- Students can submit their assignment between 11 and 11:59 PM but in this case it will be consider as late submission.
- You will be given 10 minutes to demonstrate your project. Questions asked will be related to the working of your program.
- *Further information is provided in the course syllabus.*

Objectives

- Reading/Writing from/on files
- Learn how to use and implement Class and Object concepts.
- Applying the Inheritance concept
- Using ArrayList to apply the Polymorphism and the concepts

How to submit your assignment?

- Submit your assignment on the Blackboard ONLY.
- Make sure to add your names / IDs / Section / Your name / Assignment number at the beginning of your program

Description of FCIT Computer Lab

What is a FCIT Computer Lab?

A computer lab is composed of a collection of computers. Each computer has a variety of software installed and attached to it are several peripheral devices (including a mouse, keyboard, printer, and so on). Every lab is usually managed by a lab technician.

The lab technician wants you to develop a program that will help him get access to the following information: all the information about the software that is installed and running on each computer, as well as all peripherals attached to each computer. So, at the end of the day, a lab technician will run your program to make a backup text file of all the computer specifications for a certain lab. This can be used for historical purposes.

The Initial Procedure of the Program

You will use the **fcitInput.txt** File to read the input data. Make sure that the file exists. If it doesn't exist, you should display a specific message [\[see the given sample input file\]](#).

The syntax of each record in the **fcitInput.txt** file is as follow:

CommandName [CommandDetails]

The *CommandName* can be:

1. Add Computer

a) Read the computer detail from the **fcitInput.txt**.

Example

```
Add_Computer Dell 4.5 Inspiron-14 c1
```

In the above example, **Add_Computer** is a Command, **Dell** is the Company Name, **4.5** is the speed, **Inspiron-14** is the model, **c1** is the Computer code.

b) Add the computer detail in the Device Array List.

2) Add Printer

- a) Read the printer detail from the `fcitInput.txt`.

Example

```
Add_Printer HP DeskJet true p1
```

In the above example, *Add_Printer* is a Command, *HP* is the Company, *DeskJet* is the printer type, *true* is the printer color, *p1* is the printer code.

- b) Add the printer detail in the Device Array List.

3) Add_Mouse

- a) Read the mouse detail from the `fcitInput.txt`.

Example

```
Add_Mouse HP Wireless m1
```

In the above example, *Add_Mouse* is a Command, *HP* is the Company, *Wireless* is the mouse type, *m1* is the mouse code.

- b) Add the mouse detail in the Device Array List.

4) Add_Software

- a) Read the software detail from the `fcitInput.txt`.

Example

```
Add_Software Microsoft-Office 2015 s1
```

In the above example, *Add_Software* is a Command, *Microsoft-Office* is the Name, *2015* is the version, *s1* is the software code.

- b) Add the software detail in the Device Array List.

5) Install_SW to install the software in a computer.

- a) Read the computer code and software code from the command.

Example

```
Install_SW c1 s1
```

In the above example, *Install_SW* is a Command, *c1* is the computer code, *s1* is the software code.

- b) Search the computer code and software code in the Device Array List.
- c) Make sure that a computer may not have more than FIVE softwares installed in the computer.
- d) Verify that the requested software should not be installed before
 - i. If the software is already installed, display the message “computer has already the software”.
- e) In other case, install the software in the computer using appropriate method.
- f) Update the output file as required [see the fcitOutPutLab.txt].

6) Install_printer to connect a printer to a computer.

- a) Read the computer code and printer code from the command.

Example

```
Install_printer c1 p1
```

In the above example, *Install_printer* is a Command, *c1* is the computer code, *p1* is the printer code.

- b) Search the computer code and printer code in the Device Array List.
- c) Call the appropriate method to install the printer with the computer.
- d) Update the output file as required [see the fcitOutPutLab.txt].

7) Install_mouse to connect a Mouse to a computer.

- a) Read the computer code and mouse code from the command.

Example

```
Install_mouse c1 m1
```

In the above example, *Install_mouse* is a Command, *c1* is the computer code, *m1* is the mouse code.

- b) Search the computer code and mouse code in the Device Array List.
- c) Call the appropriate method to install the mouse with the computer.
- d) Update the output file as required [see the fcitOutPutLab.txt].

8) Un-Install Software to uninstall the software from a computer.

- a) Read the computer code and software code from the command.

Example

```
UnInstall_SW c13 s4
```

In the above example, *UnInstall_SW* is a Command, *c13* is the computer code, *s4* is the software code.

- b) Search the computer code and software code in the Device Array List.
- c) Verify that the computer must have a software Otherwise output the message “The computer has no software to be uninstalled”.
- d) Otherwise match the requested software with the installed one and then uninstall it.
- e) Update the output file as required [see the fcitOutPutLab.txt].

9) List All Computer Configuration to know complete installation/ configuration details of *all computers* [see the fcitReportLab.txt]

10) List Computer With SW to know the information of the computers that have Microsoft Software installed [see the fcitReportLab.txt]

Example

```
List_Computer_With_SW Microsoft-Office
```

In the above example, *List_Computer_With_SW* is a Command, *Microsoft-Office* is the software name.

11) List Computer Speed > to know the information of the computers that have speed more than 5.0. [see the fcitReportLab.txt]

Example

```
List_Computer_Speed_> 5
```

In the above example, *List_Computer_Speed_>* is a Command, *5* is the speed.

12) Compare Computer Speed to compare the speed of two computers

- a. Read the computer code from the command.

Example

```
Compare_Computer_Speed c1 c5
```

In the above example Compare Computer Speed is a Command, **c1** is the computer code, **c5** is the computer code.

- b. Search both the computer codes in the Device Array List.
- c. Call the appropriate method to compare their speeds.
- d. Update the output file as required [see the fcitOutPutLab.txt].

13) Quit to exit from the system [see the fcitOutPutLab.txt].

You will use the fcitOutPutLab.txt File to write the output data [see the given sample output file].

Arrays to be created

```
ArrayList<Device> All_devices=new ArrayList<Device>();
```

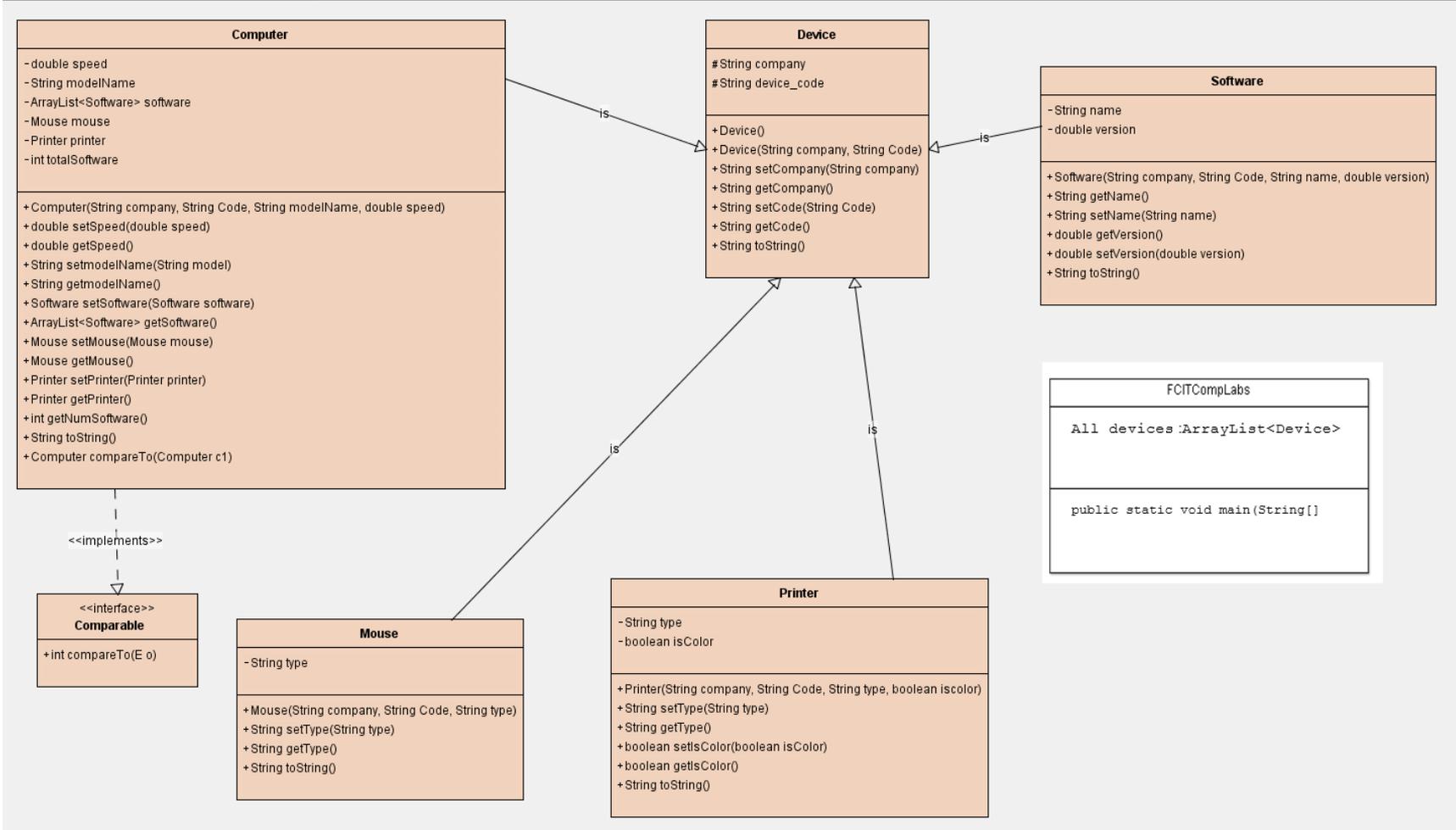
Implementation:

You will need the following classes.

1. Device [super class]
2. Computer [sub class of Device].
3. Comparable interface
4. Software [sub class of Device]
5. Mouse [sub class of Device]
6. Printer [sub class of Device]
7. FCITCompLabs [Main Application class].

UML Class Diagram for FCIT Computer Lab:

The UML diagram below is a basic one and it gives you an idea of the requirements. You can add new methods as you need them to complete the assignment.



Zoom to enlarge

Important Notes:

- Use of Files, Reading/Writing from/on files
- Use of class & object, arrays of Object, and passing object to method
- Applying the Inheritance concept
- Using ArrayList to apply the Polymorphism and the concepts.
- Your program output must be exactly same as given sample output files.
- Your display should be in a readable form.
- Organize your code in separated methods.
- Document your code with comments.
- Use meaningful variables.
- Use dash lines between each method.
- **Delayed submission will not be accepted and there will not be any extension of the project.**

Deliverables:

- You should submit one zip file containing all java codes:
- **NOTE: your name, ID, and section number should be included as comments in all files!**

Input and Output Format

Your program must generate output in a similar format to the sample run provided. **Sample input:** See sample input file.

Sample output: See sample output files.

Good Luck!