

CS1073 - Assignment #4 - Fall 2020

Submission Deadline: Friday, October 9th before 12:00 NOON (Atlantic Daylight Time Zone) in the Assignment 4 dropbox in Desire2Learn. (Read the submission instructions at the end of this document carefully).

The purpose of this assignment is:

- to help develop your understanding of objects and classes,
- to illustrate the "has-a" relationship between classes, and
- to review javadoc

This assignment is to be done individually. If you have questions, direct them to a tutor/assistant during a help session in the "Faculty of Computer Science Student Success Centre" team or to your course instructor.

As always, begin by creating a new folder to hold your work for this assignment.

I. A Bunk class:

Create a class named Bunk that can be used to represent a bed at a sleep-away camp for children and teens. Each bunk is in a particular cabin, so we need to record the name of that building (e.g. Blue Jay Cabin). We also need to know the bed number (e.g. 5). In addition, we want to know how much the bunk costs per week (e.g. 50.00).

Provide a constructor method (which initializes all three instance variables), as well as a simple accessor method for each variable. (Including the constructor, you will have a total of 4 methods.)

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Compile your Bunk class and check it over carefully. It is recommended that you write a short driver program to test this Bunk class before proceeding. However, this test driver does not need to be submitted to Desire2Learn; it is just for your own testing/verification purposes.

Now, write javadoc comments for your Bunk class. Include a comment for the class, for each instance variable and each method. Use @author, @param & @return tags where appropriate. Run the javadoc utility on your file and view the resulting Bunk.html file in a browser to make sure that your javadoc comments were inserted/formatted correctly. (Be sure to include author and private information when generating the documentation with javadoc.)

Once you have tested and documented your Bunk class, you may move on to part II.

II. A Camper class:

In the same directory (folder), create a new class called Camper. This class will be used to represent a child or teen who is staying at the sleep-away camp. For each camper, we will have the following instance variables:

- name - The full name of the child or teen (e.g. Jane Doe).
- campFees - The amount that this camper's parents will pay per week for the program that they have selected.
- excursionFees - The amount that this camper will pay per week for the extra activities outside the camp that they have selected.
- fundingSupport - The amount of funding (charitable donations) that this camper receives each week to help their family cover expenses. (e.g. 25.00)
- bunk - The bunk within the camp where this camper is currently staying. (Note: use the class that you created in part I.)

Provide a constructor method that will initialize all of the instance variables.

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Provide the following mutator methods:

- setName
- setCampFees
- setExcursionFees
- setFundingSupport
- setBunk

Provide the following accessor methods:

- getTotalWeeklyFeesOwing - This method will return the total fees that must be paid to the camp this week; this takes into account the basic camp fees, excursions and bunk fees, as well as the financial support that the camper will receive through donations.
- getOnSiteMailLabel - This method will return a textual string that includes the camper's name and bunk location (cabin and bed number); the string should be in the following format:

```
Jane Doe  
Blue Jay Cabin, bed 5
```

Side note: Remember that you can insert a newline into a String by using the concatenation operator and "\n" – consult your textbook and course notes for more information.

Compile your Camper class and check it over carefully.

Then, write javadoc comments for your Camper class. Include a comment for the class, for each instance variable and each method. Use @author, @param & @return tags where appropriate. Run the javadoc utility on your file and view the resulting Camper.html file in a browser to make sure that your javadoc comments were inserted/formatted correctly. (Be sure to include author and private information when generating the documentation with javadoc.)

III. A driver program:

In a separate file, create a test driver, (a class with a main method), named `As4TestDriver`. This test driver will use the code that you wrote for parts I and II (described above). In your test driver, please use the test data that is described below. Note: Some extraneous information is included in the sentences below (to better tell the story); you only need to record the pertinent information. (You should NOT add extra fields to the classes that you built in parts I and II.)

Begin by creating objects based on the following information:

- Anna Marie Sullivan is staying in bed 7 of Chickadee Lodge. Anna Marie's accommodation costs \$155.75 per week. She is enrolled in the Middle School Girls Adventure Camp program, so her camp fees amount is \$250.00 per week. She has signed up for two off-grounds excursions (one to go rock climbing and another to visit a waterpark), and the combined cost of these activities is \$148.30 per week. She received funding this year from a local church, valued at \$150.00 per week.
- Porter Smith has been assigned bed 16 in Moose Hall. Porter's room costs \$131.25 per week, and he is enrolled in the Senior High Co-Ed Sports Camp program, which carries fees of \$340.00 per week. Porter is headed into his senior year of high school this fall and wants to pack in lots of experiences this summer; so, he has signed up for several excursions, which cost a total of \$277.88 per week. Porter does not receive any funding (\$0).
- Katharine Doucet is staying in bed 11 of Brookside Cabin. Katharine's cabin is air-conditioned and features some amenities that other cabins do not; the cost of her bunk is \$385.00 per week. She has been awarded funding totalling \$175.00 per week. As a camper in the Grades 3-5 Music & Drama Camp program, Katharine's family pays \$565.30 per week in basic camp fees. Katharine's parents have only signed her up for one excursion, a weekly outing to walk to a nearby school to take in a community theatre performance, which is free; so her activity amount is \$0.

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Next, add method calls to your code (below the code that you already have) to record the fact that:

- Anna Marie has seen a poster for an excursion to an archery range on Saturday afternoons, and she decides to give it a try. This new activity increases her fees. Her activities cost is now \$178.80.
- Porter has moved to a new bunk to be closer to some of his friends from school. He's now in bed 9 of Wolf Lodge and his new room costs \$147.00 per week.
- Katharine and her parents have decided that she should change programs; she has switched from the Grades 3-5 Music & Drama Camp program to the Beginner Dance Camp program. Her weekly camp fees amount is now \$525.00 per week.

Finally, add code to the bottom of your main method to retrieve and print out for each camper:

- A mail label.
- The total amount of fees owing (for one week).

Run your test driver and redirect the output to a file named As4Output.txt. Examine this file carefully to verify that your code works properly. If there are any problems, you may need to return to parts I and/or II to modify some of that code. If you do need to modify your code from parts I and/or II, check to see if any changes to the javadoc comments are also needed.

Include a javadoc comment at the top of your As4TestDriver class. This comment should include a one-line description of the class and @author information.

Submission instructions are on the next page...

Your electronic assignment submission (submitted via Desire2Learn) will consist of two files:

- i. a written report. This should begin with a title page; just as we described in Assignment #1, your title page should include: the course (CS 1073), your section (FR01A, FR02A, FR03A or FR04A), the assignment number, your full name, and your UNB student number. That should be followed by four sections, with each part clearly identified with a section heading. Include:
 - a. the source code for Bunk.java,
 - b. the source code for Camper.java,
 - c. the source code for As4TestDriver.java, and
 - d. the sample output from running your application.

This written report should be prepared using a word processor; we recommend using Microsoft Word (i.e. create a .docx file for your report). Copy & paste your java source code & required output into the report document. Add appropriate headings for each part. Fix up the formatting where necessary, adjusting line breaks & page breaks to ensure that your document is easy to read. Use a monospaced font for your code to maintain proper indentation.) Once the report is complete and you've checked it all over, save the .docx file for your own records, and then **save a second copy in pdf format for submission**. (Note: Be sure to open that file in a pdf viewer to verify that the pdf was generated correctly.) The **SINGLE pdf file** containing your report will be submitted to the appropriate assignment drop box on Desire2Learn. (It is important that you submit a pdf file and NOT the original Word document. This pdf will allow the marker to write comments directly on your work to give you better feedback.)

Note: Please name this report as follows: **YourName_As4_Report.pdf**

- ii. an archive file (**.zip**) that contains your Java source code and output for this assignment. Make sure that your archive includes all .java files (in case the marker wishes to compile & run your code to test it). You should not include the report document or the .class files in your archive. This archive should be submitted as a **single file** to the appropriate drop box on Desire2Learn.

Note: Please name this archive file as follows:
YourName_As4_Archive.zip

End of Assignment 4