

ITEC 120: Principles of Computer Science I

Homework 10 – TV Program Schedule

>>>>>>> Due Date: April 6th at 10:00 PM via Desire 2 Learn <<<<<<<

In doing this homework, remember to abide by the RU Honor Code.

Problem 1

30 points

You are preparing for summer vacation and realize that you are going to a region that has cable TV but does not have internet access. In order to keep up with your favorite TV shows you must write a computer program that will allow you to find out what is on at a particular hour and when a particular show is on.

A TV show has a name, start time, and end time. The area where you are staying uses military time, so the starting and ending times will be specified in military time. Hint: to easily handle time, you will need to convert and store the time in minutes instead of hours and minutes. In order to undo the conversion from solely minutes to hours and minutes, divide by 60 to get the number of hours and $\text{mod}(\%)$ by 60 to get the minutes.

There will be no more than 100 TV shows in your system at any point in time. You should use an array with a tombstone or marker to keep track of how many active TV shows have been entered into your system. Also, no TV program will span from the end of one day until the beginning of the next day.

Commands

Your program will be a command line simulator and must read and respond to several commands from a Scanner. The TV scheduler has four different commands: `addShow`, `checkWhatsOn`, `quit` and `timeFor`.

addShow: The `addShow` command reads in the name of the show, the time it starts in the format of hours:minutes, and the time it ends in the format of hours:minutes. All values are on separate lines.

checkWhatsOn: The `checkWhatsOn` command reads in the time in the format of hours:minutes and prints out the TV shows that are on at that particular time.

timeFor: Reads in the name of the TV show and prints out the starting and ending time in the format of hours:minutes.

quit: Stops the program.

Input

Input to your program will happen through a Scanner. You should output a prompt to the user that tells them what information to enter, i.e. Enter command>. An example test case is presented below:

```
addShow
Glee
21:00
22:00
addShow
Pawn Stars
21:30
22:30
addShow
American Idol
10:00
11:00
checkWhatsOn
21:30
timeFor
American Idol
timeFor
Glee
timeFor
Pawn Stars
quit
```

Testing note: your program must allow for a file to be redirected as input to the program. If it does not, then you will receive a 0 on this program. For this to work, create one and only one Scanner in your program.

After you redirect the following information into your program, it might look like this:

```
Enter command>Enter show name>Enter show start>Enter show end>Enter
command>Enter show name>Enter show start>Enter show end>Enter command>Enter
show name>Enter show start>Enter show end>Enter command>Enter time>The show
Glee is on
The show Pawn Stars is on
Enter command>Enter show name>Show begins at 10:00
Show ends at 11:00
Enter command>Enter show name>Show begins at 21:00
Show ends at 22:00
Enter command>Enter show name>Show begins at 21:30
Show ends at 22:30.
```

The reference solution for this project is 90 lines of code without comments. Feel free to use more or less code in your solution. This number is provided to help you gauge the difficulty of the assignment.

Constraints:

You must model the TV show as an object. The TV show object should store its name and starting/ending times as minutes stored in an integer. The TV show object must also have a function that converts time in the format of hours:minutes to solely minutes stored in an integer. It must also have a function that converts from an integer holding minutes to a String holding the time in the format of hours:minutes. The TV show object should also return whether or not it is on at a particular time.

You must also submit a test case that is similar but not identical to the previous usage scenario. By doing so, you demonstrate that you have tested your program beyond the basics.

Submission requirements:

You must submit the .java file containing your program to Desire 2 Learn under the Homework #10 assignment. If your submitted file does not compile, it will receive a 0. You can demo the homework the next school day after it is due, or it will be graded automatically. If you choose not to demo your homework you cannot contest the grade you receive.

Grading Rubric

3 Points – Is the TV show properly modeled as an object?

10 Points – Does it properly display what is on at a particular time and what time a show starts?

5 Points – Is the array of TVs and tombstone implemented properly?

5 Points – Was a reasonable test case included in the file.

7 Points – Is the program commented using inline and javadoc comments?