

CST8130: Data Structures

Assignment #1- Events Planner – Using ArrayList

DUE: Saturday October 3, 2020 11:59 PM SHARP!!!

Demo: During lab hours of week 5

Problem Description:

In this assignment, we will develop a tool that we can use to keep track of activities (events) – a basic electronic planner. In order to bound the scope of the assignment, you are required to build a system that:

- will be able to add events from a file or from the keyboard, delete events and view events for a specific date or for a week starting at a specific date or for a month.
- handle multiple kinds of events- specifically events could be **school** work that is due, **meetings** to attend, a shift at **work**, **gym** to attend, or a **social** activity.
- events will be stored as an ArrayList
- there can ONLY be one event for a given date and time
- deletes and retrieves events *efficiently*.
- Events should be in numeric order from smallest to largest by date/time in the most efficient way possible. (you need to write recursive binary search code to find whether an event exists. When adding events, you need to find the correct position to which it has to be added in the ArrayList so that your list will always be sorted on date and time. **DO NOT use collections methods**).
- all events will contain a date (day, month, year), time (hour, minute), activity description (String)
 - meeting events will also contain a location (String - where the meeting will occur)
 - work events will also contain name of work place (String) and number of hours (double) in the shift
 - social events will contain no other information
 - school events will contain no other information
 - Gym events will contain no other information
- **At no time can your program crash! Add Exception handling for all inputs from keyboard and file. Provide validity checks wherever required.**
- I have released two classes that you can use in this assignment - a Date class (called OurDate) and a Time class (called OurTime). You need to add data validation and exception handling to these classes. You will also need to add some comparison methods (isGreater and/or isLess and isEqual) to these classes.

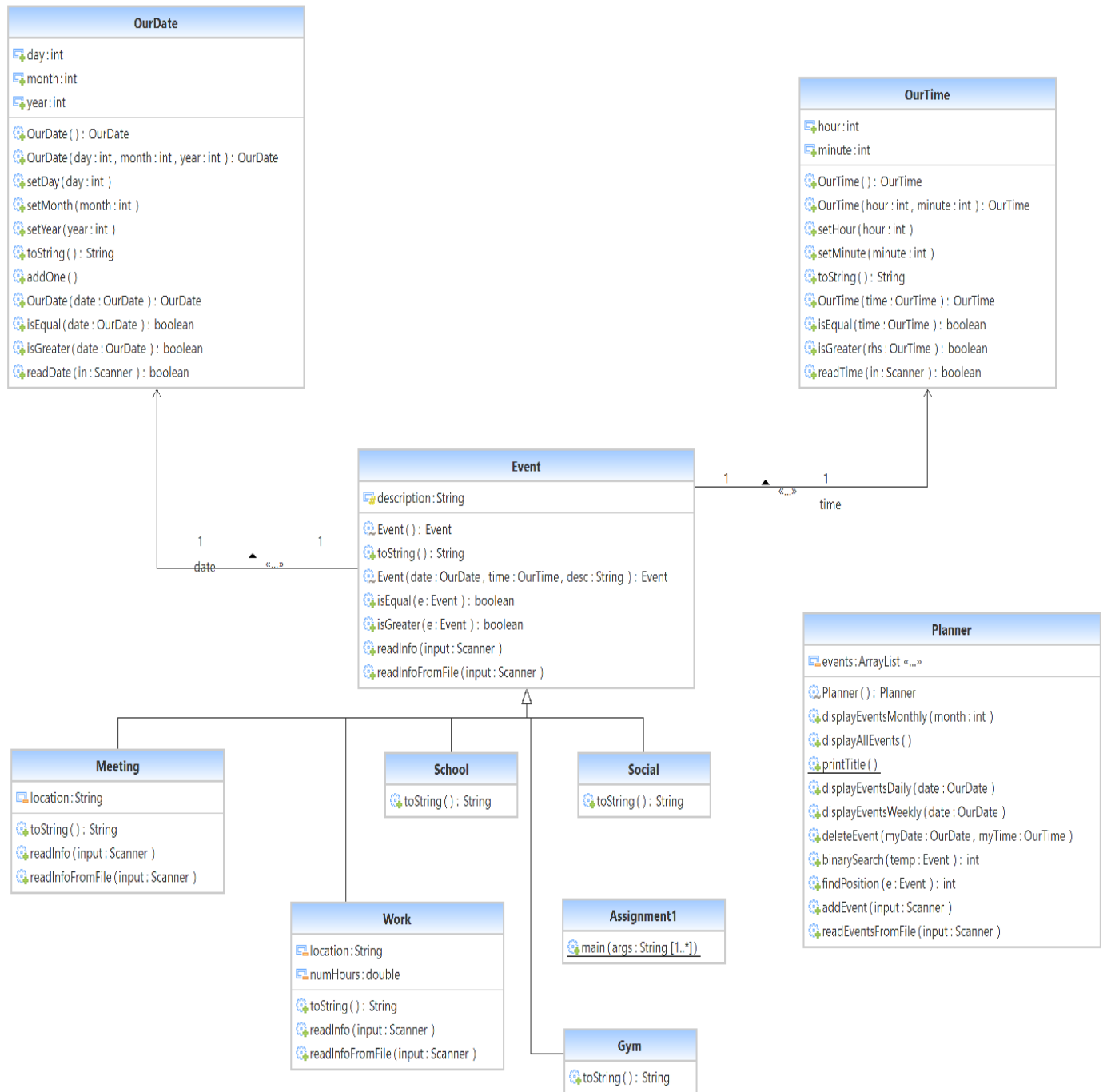
Submission:

You must submit a zip file (named **LastnameFirstNameAssign1**) to the assignment link in Brightspace by the due date and time containing:

- all source code – ie .java files (Note – I may choose to re-compile your program....so all code must be available to me) with headers (see my header in OurDate, OurTime classes)
- Your test plan for all possible cases in Word/Excel format

Failure to provide any of the above will have an effect on your grade for this assignment.

UML Diagram



(Attributes in OurDate and OurTime are private. By some reason, UML diagram is not recognizing them as private.)

Sample Output (User input in blue)

```

=====
EVENTS PLANNER
=====
1 ... Add an event from keyboard
2 ... Display events of a day
3 ... Display events of a week
4 ... Display events of a month
5 ... Delete an event
6 ... Add events from a file
7 ... Display all events
8 ... Quit
Enter your option: a
Input mismatch exception
1 ... Add an event from keyboard
2 ... Display events of a day
3 ... Display events of a week
4 ... Display events of a month
5 ... Delete an event
6 ... Add events from a file
7 ... Display all events
8 ... Quit
Enter your option: 6
  2|   1| 2020|   10|   0|           StaffMeeting|           T307|
  2|   2| 2020|   11|  30|           StaffMeeting|           T307|
  3|   3| 2020|    9|   0| CommitteeMeeting|           T317|
  2|   3| 2020|   11|   0|           CST8130Class|
  2|   2| 2020|   18|   0|           CST8130Test|
  2|   3| 2020|   16|   0|           CST8130LabDue|
  2|   3| 2020|   15|  30|           CST8130Class|
  2|   1| 2020|   14|   0|           Work| BestBuy| 8.00
  2|   2| 2020|   17|   0|           Work| Library| 4.00
  2|   2| 2020|   18|   0|           Work| BestBuy| 8.00
You already have an event scheduled for that date and time.... cannot be added
  4|   2| 2020|    7|   0|           Work| Library| 7.00
  2|   3| 2020|   17|  30|           Gym|
  3|   3| 2020|    7|   0|           Gym|
  3|   3| 2020|   17|  30|           Gym|
  4|   3| 2020|    7|   0|           Gym|
  4|   3| 2020|   17|  30|           Gym|
  2|   1| 2020|    9|   0| Breakfast|
  2|   2| 2020|   22|   0| Party|
1 ... Add an event from keyboard
2 ... Display events of a day
3 ... Display events of a week
4 ... Display events of a month
5 ... Delete an event
6 ... Add events from a file
7 ... Display all events
8 ... Quit
Enter your option: 7
  Day| Month| Year| Hour|Minute|           Description| Location| Hours
=====
  2|   1| 2020|    9|   0| Breakfast|
  2|   1| 2020|   10|   0| StaffMeeting| T307|
  2|   1| 2020|   14|   0| Work| BestBuy| 8.00
  2|   2| 2020|   11|  30| StaffMeeting| T307|
  2|   2| 2020|   17|   0| Work| Library| 4.00
  2|   2| 2020|   18|   0| CST8130Test|
  2|   2| 2020|   22|   0| Party|
  4|   2| 2020|    7|   0| Work| Library| 7.00
  2|   3| 2020|   11|   0| CST8130Class|
  2|   3| 2020|   15|  30| CST8130Class|
  2|   3| 2020|   16|   0| CST8130LabDue|
  2|   3| 2020|   17|  30| Gym|
  3|   3| 2020|    7|   0| Gym|

```

3	3	2020	9	0	CommitteeMeeting	T317
3	3	2020	17	30	Gym	
4	3	2020	7	0	Gym	
4	3	2020	17	30	Gym	

```

1 ... Add an event from keyboard
2 ... Display events of a day
3 ... Display events of a week
4 ... Display events of a month
5 ... Delete an event
6 ... Add events from a file
7 ... Display all events
8 ... Quit
Enter your option: 1
1. Meeting
2. School
3. Work
4. Gym
5. Social
Enter type of the event: 3
Enter day - between 1 and 31: 15
Enter month - between 1 and 12: 2
Enter year: 2020
Enter hour (0-23): 15
Enter minute (0-59): 30
Enter description: ExtraShift
Enter work location: Source
Enter number of hours worked: 8
1 ... Add an event from keyboard
2 ... Display events of a day
3 ... Display events of a week
4 ... Display events of a month
5 ... Delete an event
6 ... Add events from a file
7 ... Display all events
8 ... Quit
Enter your option: 1
1. Meeting
2. School
3. Work
4. Gym
5. Social
Enter type of the event: 1
Enter day - between 1 and 31: 3
Enter month - between 1 and 12: 3
Enter year: 2020
Enter hour (0-23): 9
Enter minute (0-59): 0
Enter description: Review
Enter meeting location: Zoom
You already have an event scheduled for that date and time.... cannot be added
1 ... Add an event from keyboard
2 ... Display events of a day
3 ... Display events of a week
4 ... Display events of a month
5 ... Delete an event
6 ... Add events from a file
7 ... Display all events
8 ... Quit
Enter your option: 1
1. Meeting
2. School
3. Work
4. Gym
5. Social
Enter type of the event: 1
Enter day - between 1 and 31: 3
Enter month - between 1 and 12: 3
Enter year: 2020

```

Enter hour (0-23): 13
 Enter minute (0-59): 30
 Enter description: Review
 Enter meeting location: Zoom
 1 ... Add an event from keyboard
 2 ... Display events of a day
 3 ... Display events of a week
 4 ... Display events of a month
 5 ... Delete an event
 6 ... Add events from a file
 7 ... Display all events
 8 ... Quit

Enter your option: 7

Day	Month	Year	Hour	Minute	Description	Location	Hours
2	1	2020	9	0	Breakfast		
2	1	2020	10	0	StaffMeeting	T307	
2	1	2020	14	0	Work	BestBuy	8.00
2	2	2020	11	30	StaffMeeting	T307	
2	2	2020	17	0	Work	Library	4.00
2	2	2020	18	0	CST8130Test		
2	2	2020	22	0	Party		
4	2	2020	7	0	Work	Library	7.00
15	2	2020	15	30	ExtraShift	Source	8.00
2	3	2020	11	0	CST8130Class		
2	3	2020	15	30	CST8130Class		
2	3	2020	16	0	CST8130LabDue		
2	3	2020	17	30	Gym		
3	3	2020	7	0	Gym		
3	3	2020	9	0	CommitteeMeeting	T317	
3	3	2020	13	30	Review	Zoom	
3	3	2020	17	30	Gym		
4	3	2020	7	0	Gym		
4	3	2020	17	30	Gym		

1 ... Add an event from keyboard
 2 ... Display events of a day
 3 ... Display events of a week
 4 ... Display events of a month
 5 ... Delete an event
 6 ... Add events from a file
 7 ... Display all events
 8 ... Quit

Enter your option: 2

Enter the day for which events to be displayed:

Enter day - between 1 and 31: 2

Enter month - between 1 and 12: 2

Enter year: 2020

Your calendar events for the given date are

Day	Month	Year	Hour	Minute	Description	Location	Hours
2	2	2020	11	30	StaffMeeting	T307	
2	2	2020	17	0	Work	Library	4.00
2	2	2020	18	0	CST8130Test		
2	2	2020	22	0	Party		

1 ... Add an event from keyboard
 2 ... Display events of a day
 3 ... Display events of a week
 4 ... Display events of a month
 5 ... Delete an event
 6 ... Add events from a file
 7 ... Display all events
 8 ... Quit

Enter your option: 3

Enter the day from which events for a week to be displayed:

Enter day - between 1 and 31: 2

Enter month - between 1 and 12: 3

Enter year: 2020

Your calendar events for a week starting from the given date are

Day	Month	Year	Hour	Minute	Description	Location	Hours
2	3	2020	11	0	CST8130Class		
2	3	2020	15	30	CST8130Class		
2	3	2020	16	0	CST8130LabDue		
2	3	2020	17	30	Gym		
3	3	2020	7	0	Gym		
3	3	2020	9	0	CommitteeMeeting	T317	
3	3	2020	13	30	Review	Zoom	
3	3	2020	17	30	Gym		
4	3	2020	7	0	Gym		
4	3	2020	17	30	Gym		

- 1 ... Add an event from keyboard
- 2 ... Display events of a day
- 3 ... Display events of a week
- 4 ... Display events of a month
- 5 ... Delete an event
- 6 ... Add events from a file
- 7 ... Display all events
- 8 ... Quit

Enter your option: 4

Enter the month for which events to be displayed: 2

Your events during the month 2 are

Day	Month	Year	Hour	Minute	Description	Location	Hours
2	2	2020	11	30	StaffMeeting	T307	
2	2	2020	17	0	Work	Library	4.00
2	2	2020	18	0	CST8130Test		
2	2	2020	22	0	Party		
4	2	2020	7	0	Work	Library	7.00
15	2	2020	15	30	ExtraShift	Source	8.00

- 1 ... Add an event from keyboard
- 2 ... Display events of a day
- 3 ... Display events of a week
- 4 ... Display events of a month
- 5 ... Delete an event
- 6 ... Add events from a file
- 7 ... Display all events
- 8 ... Quit

Enter your option: 5

Enter the date and time of the event to delete:

Enter day - between 1 and 31: 3

Enter month - between 1 and 12: 3

Enter year: 1

Enter hour (0-23): 30

Enter hour (0-23): 4

Enter minute (0-59): 25

There is no event scheduled for this date and time

- 1 ... Add an event from keyboard
- 2 ... Display events of a day
- 3 ... Display events of a week
- 4 ... Display events of a month
- 5 ... Delete an event
- 6 ... Add events from a file
- 7 ... Display all events
- 8 ... Quit

Enter your option: 5

Enter the date and time of the event to delete:

Enter day - between 1 and 31: 3

Enter month - between 1 and 12: 3

Enter year: 2020

Enter hour (0-23): 17

Enter minute (0-59): 30

Event deleted

- 1 ... Add an event from keyboard
- 2 ... Display events of a day
- 3 ... Display events of a week
- 4 ... Display events of a month

5 ... Delete an event
 6 ... Add events from a file
 7 ... Display all events
 8 ... Quit

Enter your option: 7

Day	Month	Year	Hour	Minute	Description	Location	Hours
2	1	2020	9	0	Breakfast		
2	1	2020	10	0	StaffMeeting	T307	
2	1	2020	14	0	Work	BestBuy	8.00
2	2	2020	11	30	StaffMeeting	T307	
2	2	2020	17	0	Work	Library	4.00
2	2	2020	18	0	CST8130Test		
2	2	2020	22	0	Party		
4	2	2020	7	0	Work	Library	7.00
15	2	2020	15	30	ExtraShift	Source	8.00
2	3	2020	11	0	CST8130Class		
2	3	2020	15	30	CST8130Class		
2	3	2020	16	0	CST8130LabDue		
2	3	2020	17	30	Gym		
3	3	2020	7	0	Gym		
3	3	2020	9	0	CommitteeMeeting	T317	
3	3	2020	13	30	Review	Zoom	
4	3	2020	7	0	Gym		
4	3	2020	17	30	Gym		

1 ... Add an event from keyboard
 2 ... Display events of a day
 3 ... Display events of a week
 4 ... Display events of a month
 5 ... Delete an event
 6 ... Add events from a file
 7 ... Display all events
 8 ... Quit

Enter your option: 8

Good bye.... have a nice day