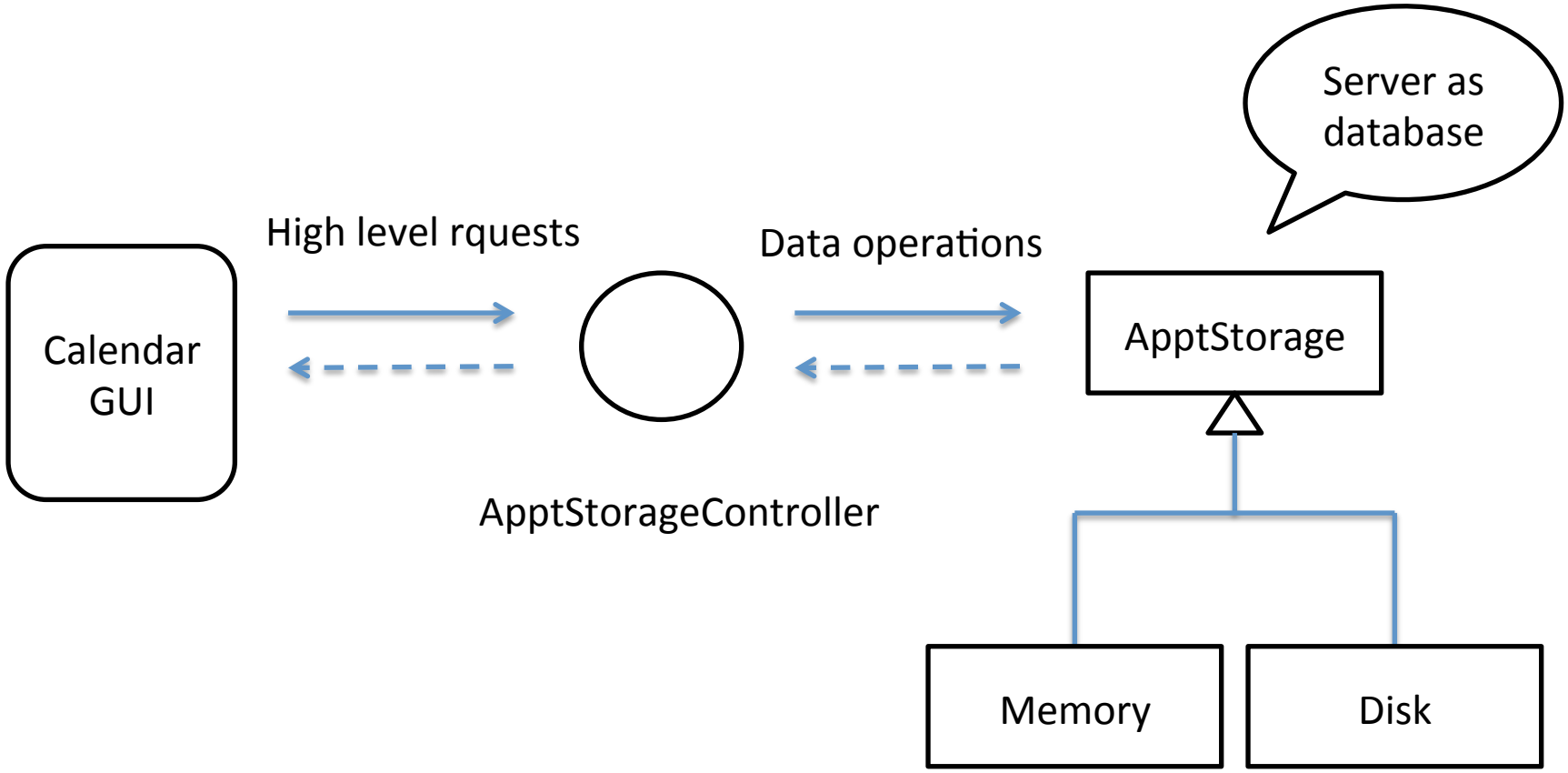
The overall calendar architecture



Important classes

- ApptStorageController and ApptStorage
- Partition of high level functions and low level data operations
- Only a suggested partition using the interface-based programming

ApptStorageController

- Communicate with GUI with high level functions
- Define “business functions”.
  - Return the earliest event from today
  - Return all events of the current week
- Feel free to add your own

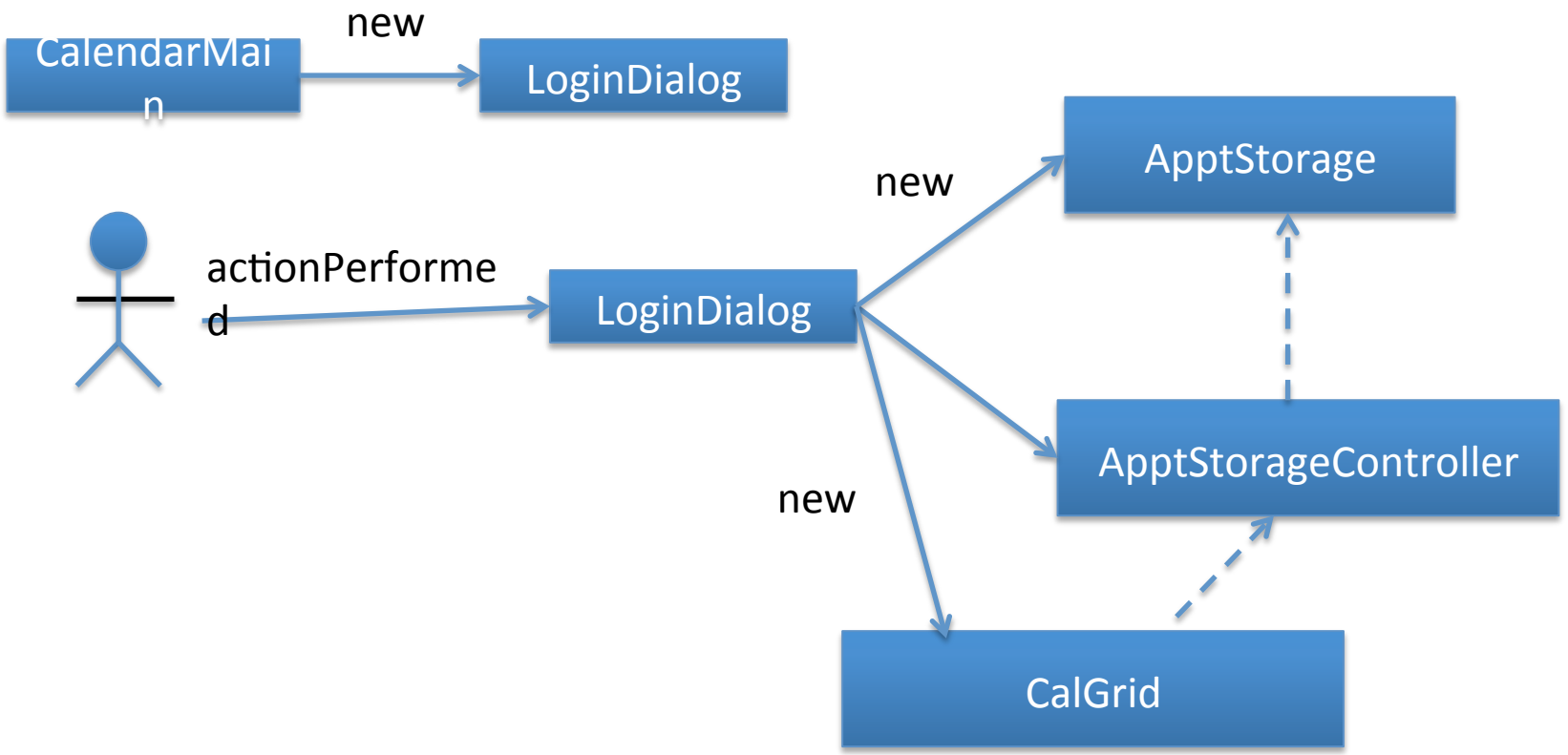
ApptStorage

- An abstract class
- Communicate with ApptStorageController on low-level data operations
- Define database like operations
  - Store event
  - Store user
  - find event
  - find user
- The implementation of the abstract class
  - Memory-based : Use Java collection classes
  - Disk-based: Use object storage classes (Phase II)
  - Database-based: Use JDBC interface (Bonus)

Partition of Tasks

- ApptStorageController
  - Return the earliest event of today
    - Ask ApptStorage to return all events
    - Sort the events according to time
    - Return the first item
  - Store event (Wait! This is a data operation)
    - Check if the event is a valid event, such as happens in the future
- Advantage
  - GUI code is simplified
  - Wrong event information → something wrong with ApptStorage
  - Wrong event → Sorting algorithm

How is everything connected?



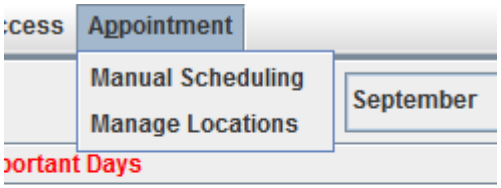
Requirement

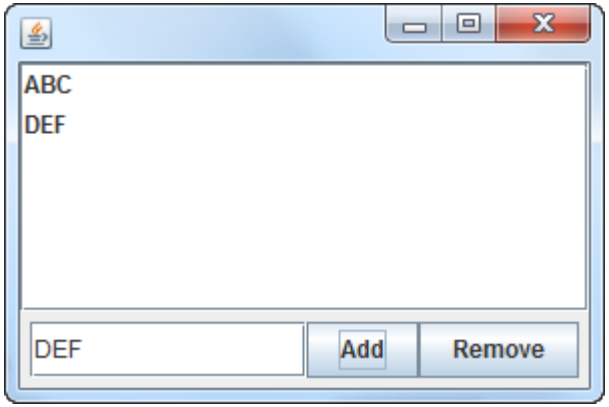
Location information:
The location must be uniquely identified by its name. The user must select from a set of predefined locations. The locations can be added through a separate interface (Note that this interface does not exist in the current skeleton).

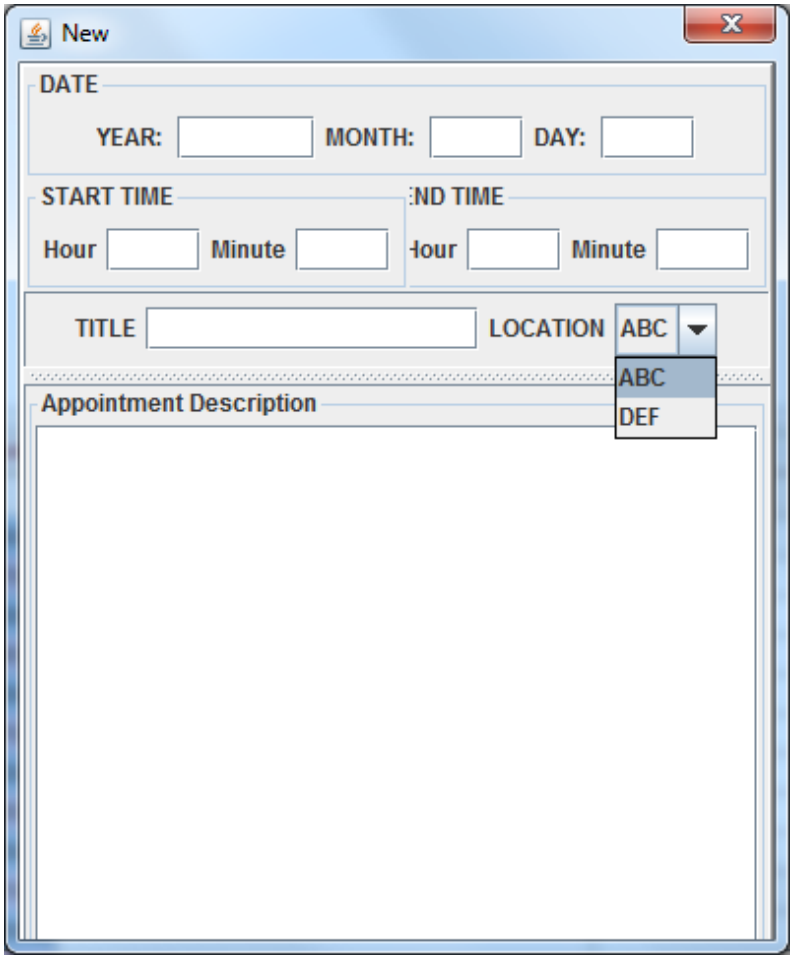
Tasks

- Need to define new classes to store location information
- Need to add a new window to input location information
- Need to add a menu item to start the new window
- Need to add a list on the event window for choosing locations.

Objective


ccess
Appointment
Manual Scheduling
Manage Locations
September
portant Days

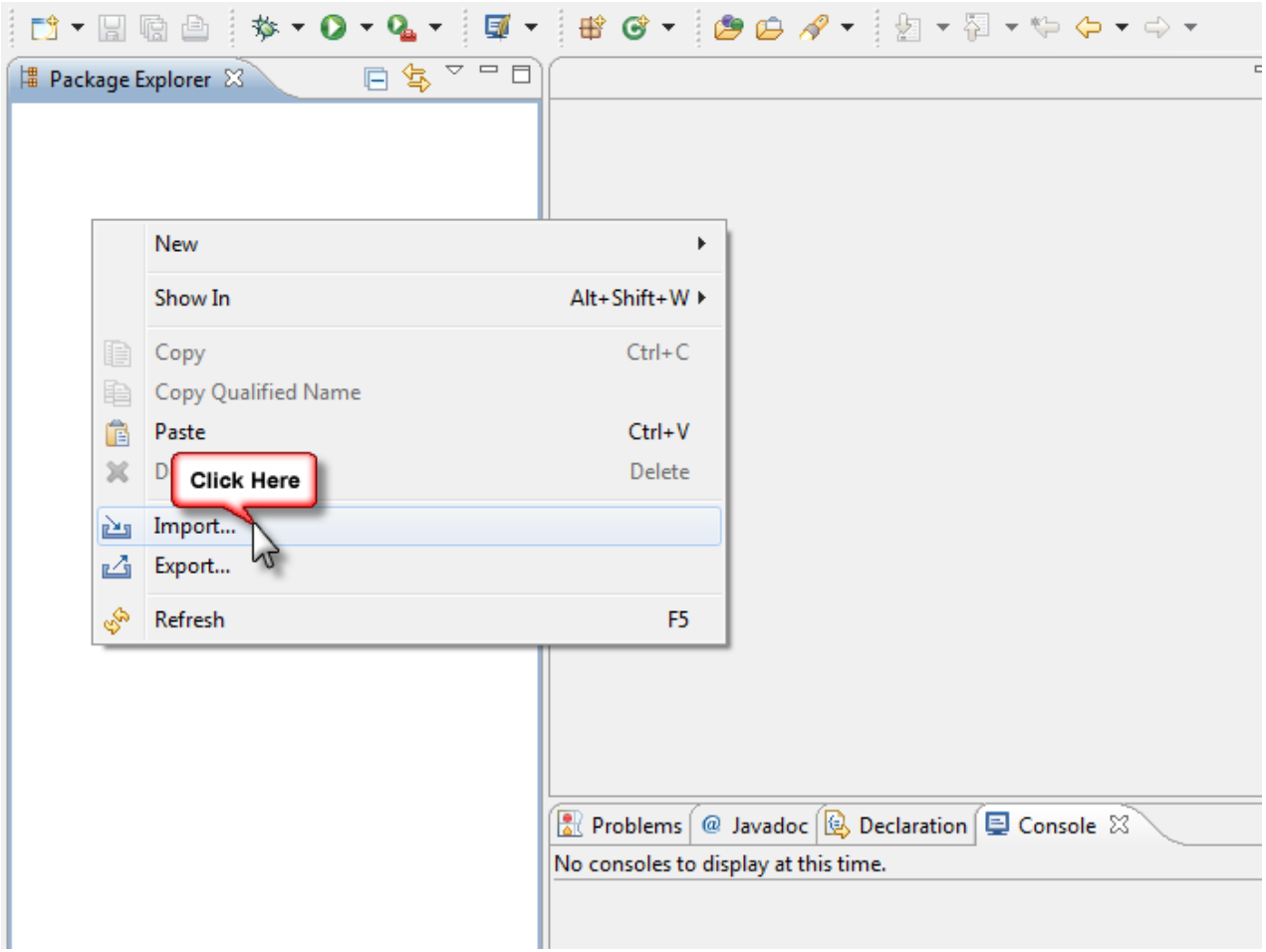

ABC
DEF
DEF
Add
Remove


New
DATE
YEAR:
MONTH:
DAY:
START TIME
Hour
Minute
:ND TIME
Hour
Minute
TITLE
LOCATION
ABC
ABC
DEF
Appointment Description

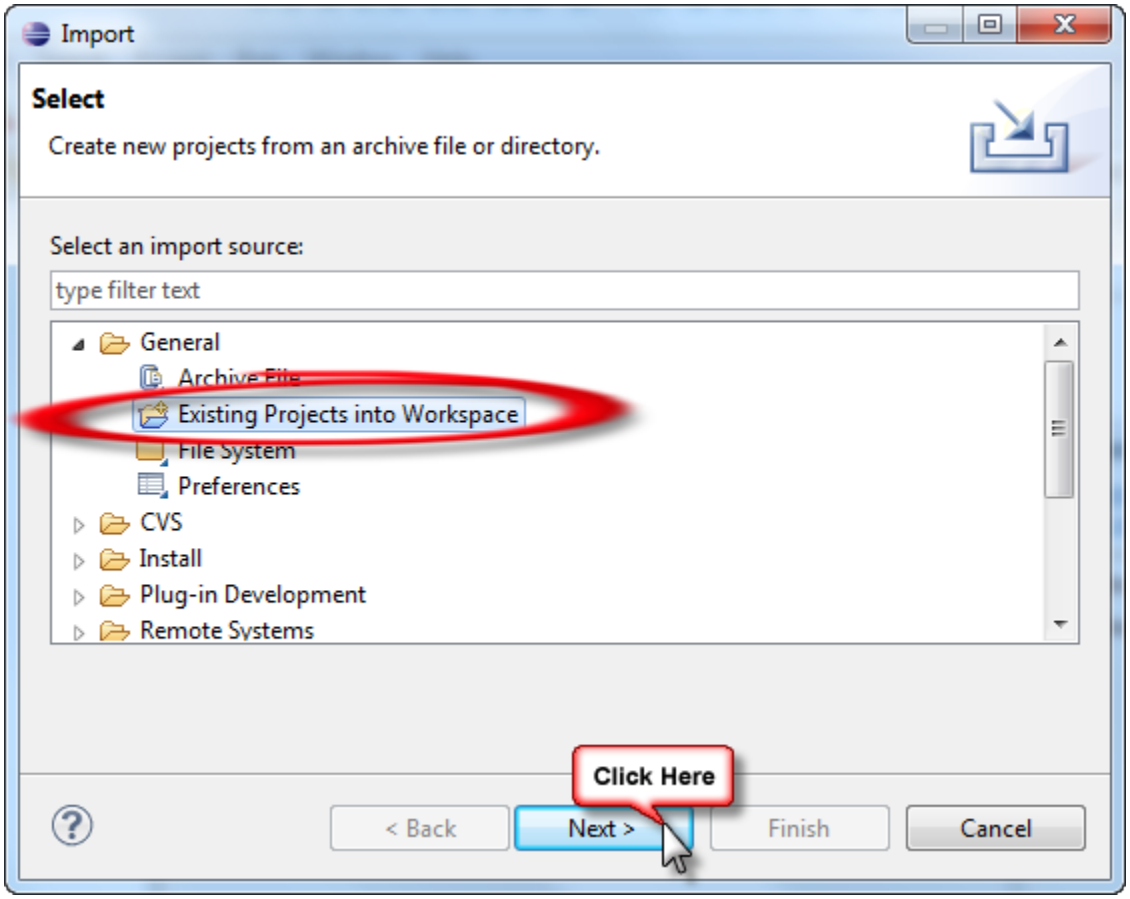
Getting Started

- Download and start Eclipse SDK
  - http://www.eclipse.org/downloads/
  - Should already installed on the lab computers
- Download the base code
  - http://course.cse.ust.hk/comp3111/project/base.jar
- Import the base code

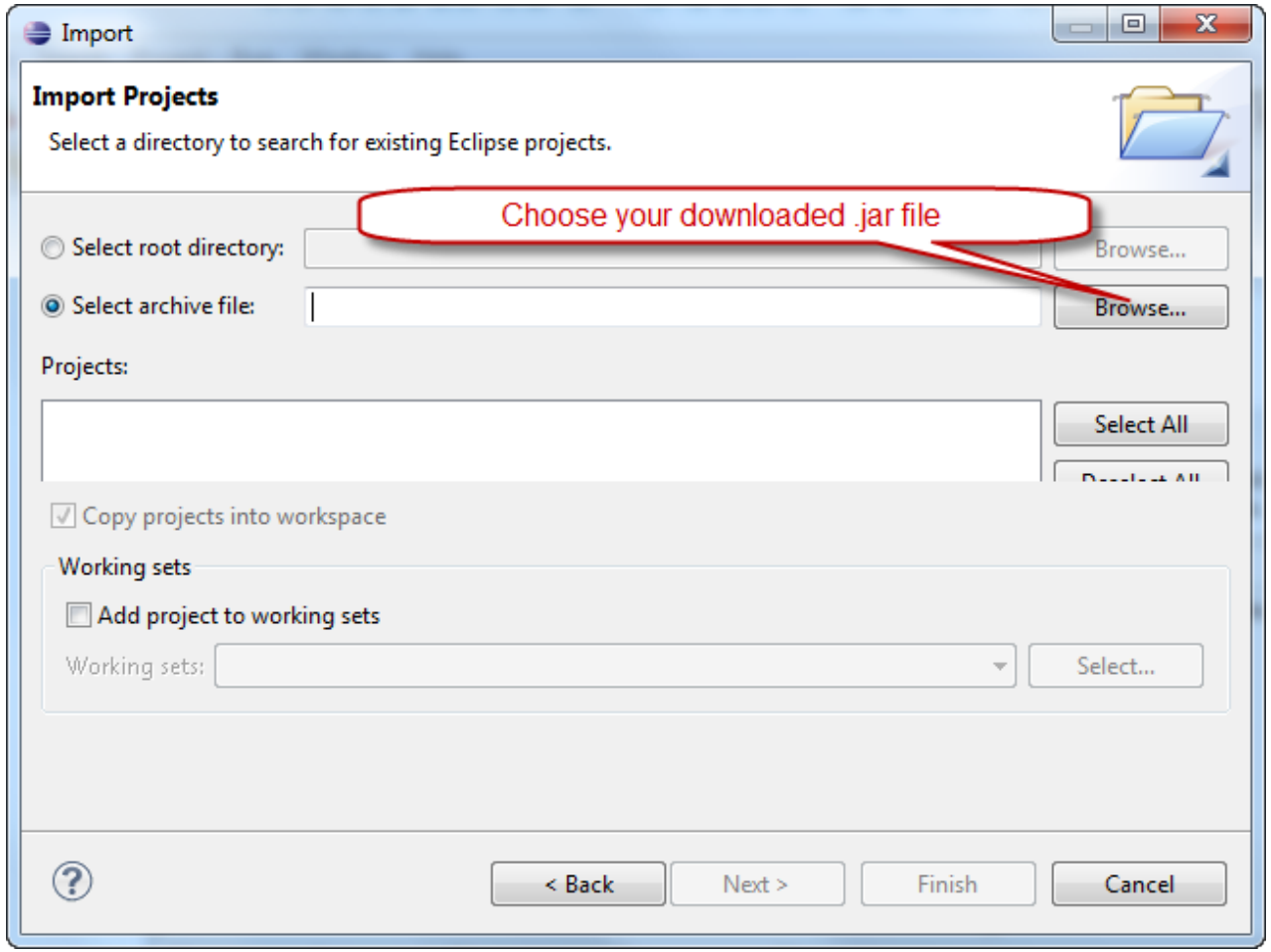
Import the base code - 1



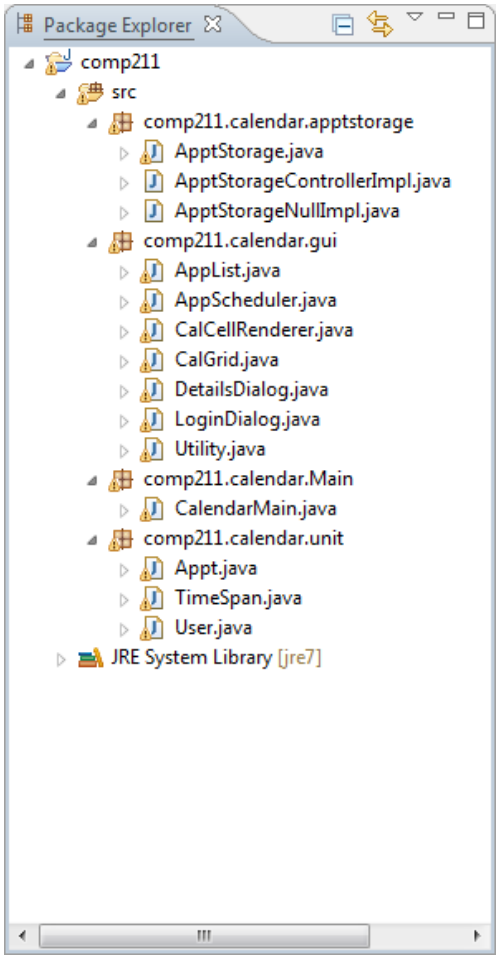
Import the base code - 2



Import the base code

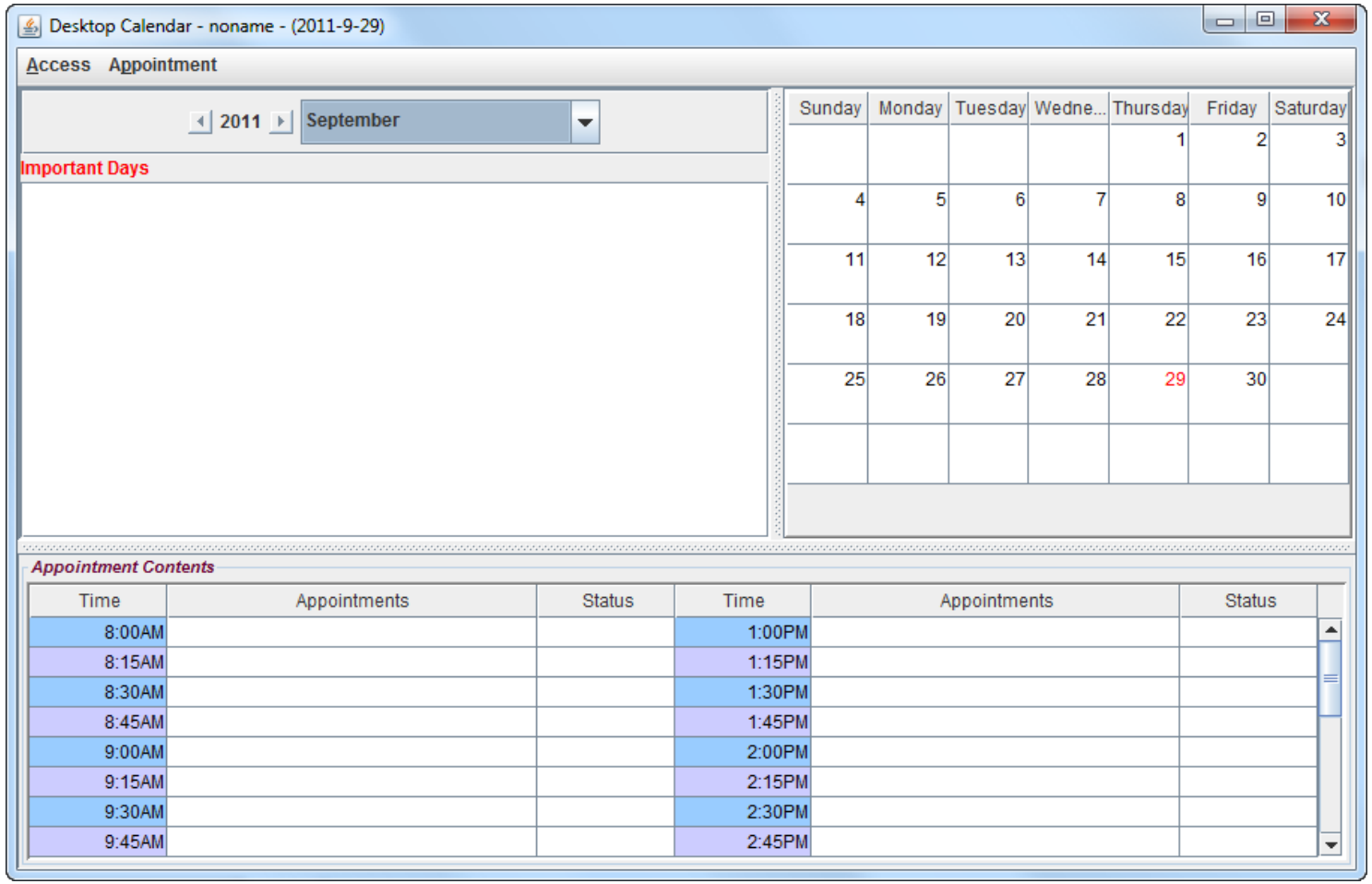


Code structure



- comp211.calendar.appstorage
  - Data storage implementation
- comp211.calendars.gui
  - GUI elements
- comp211.calendars.Main
  - Main class
- comp211.calendar.unit
  - Some data structures

Run the application



Implementing a Feature

- Add location information for event scheduling
  - Add a data structure to store the location
  - Implement the data storage for saving location data
  - Cate a dialog for manage locations
  - Create a menu entry for displaying the dialog
  - In the event creating GUI, Create a GUI element for choosing the location

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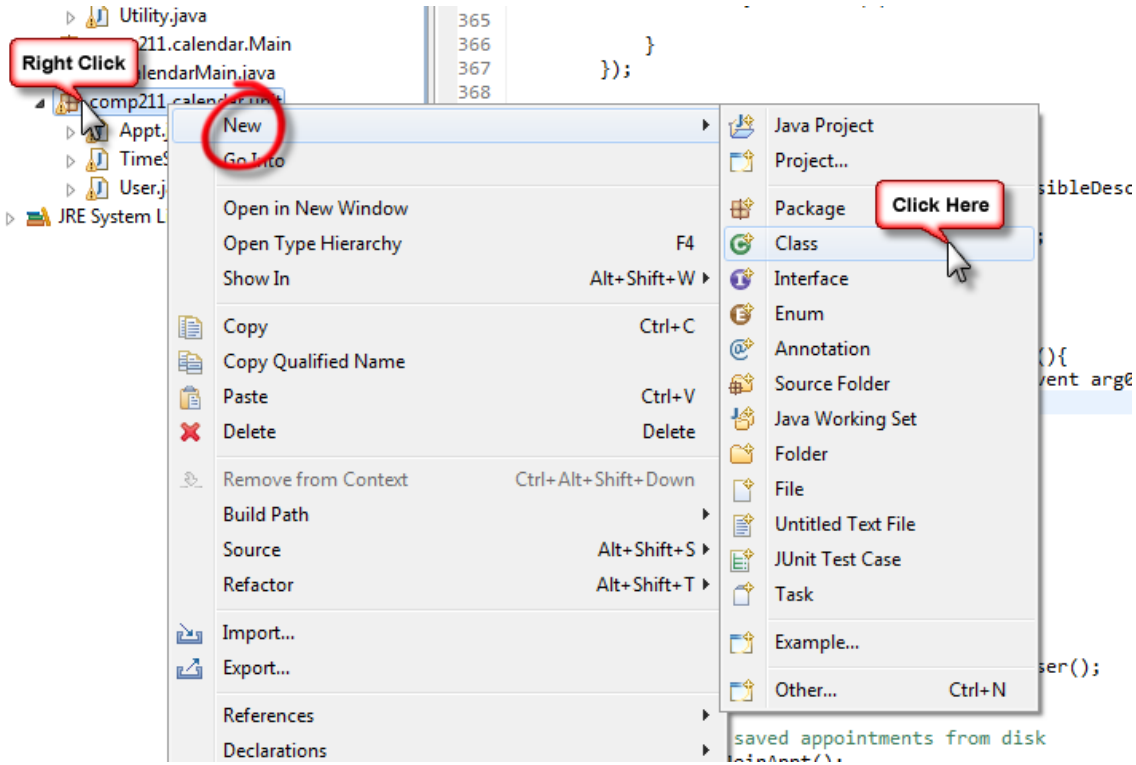
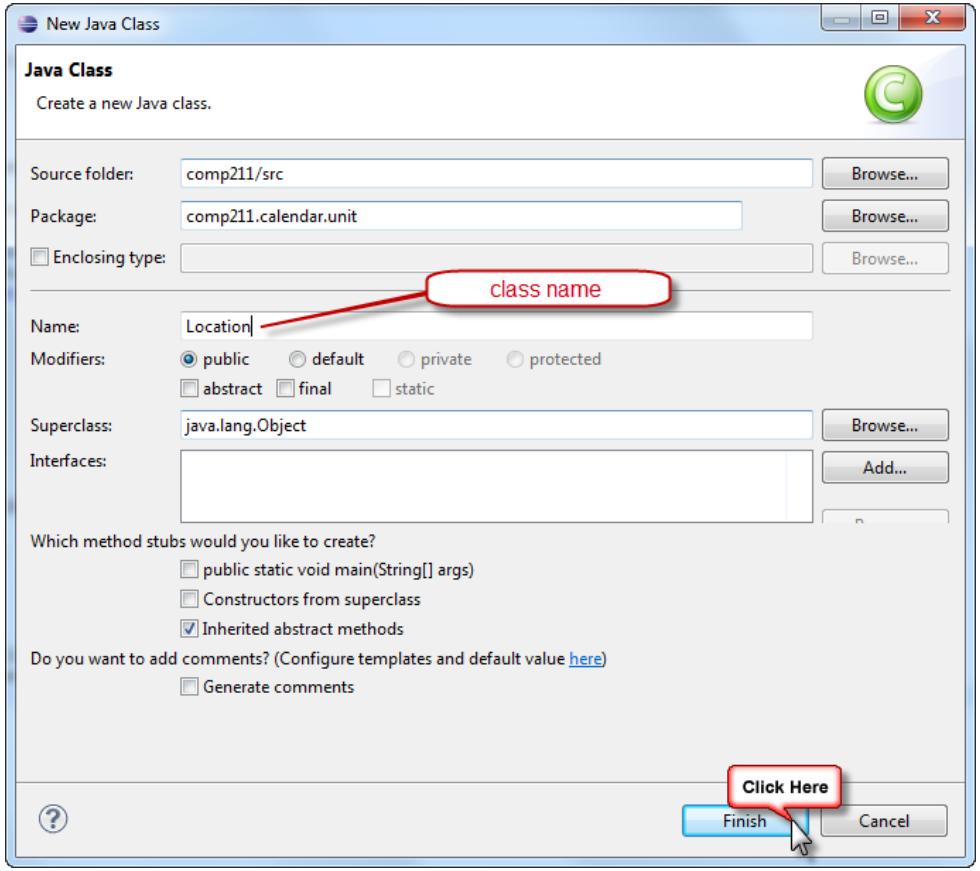
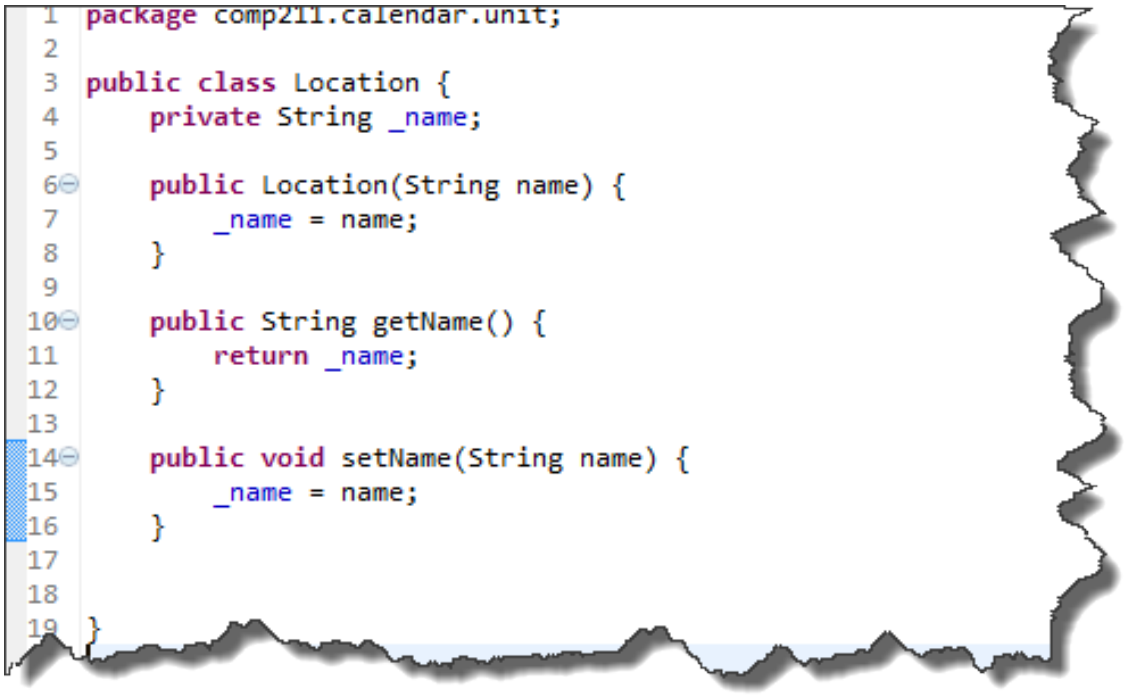


Create a data structure (new class)



New class

The name is **Location**

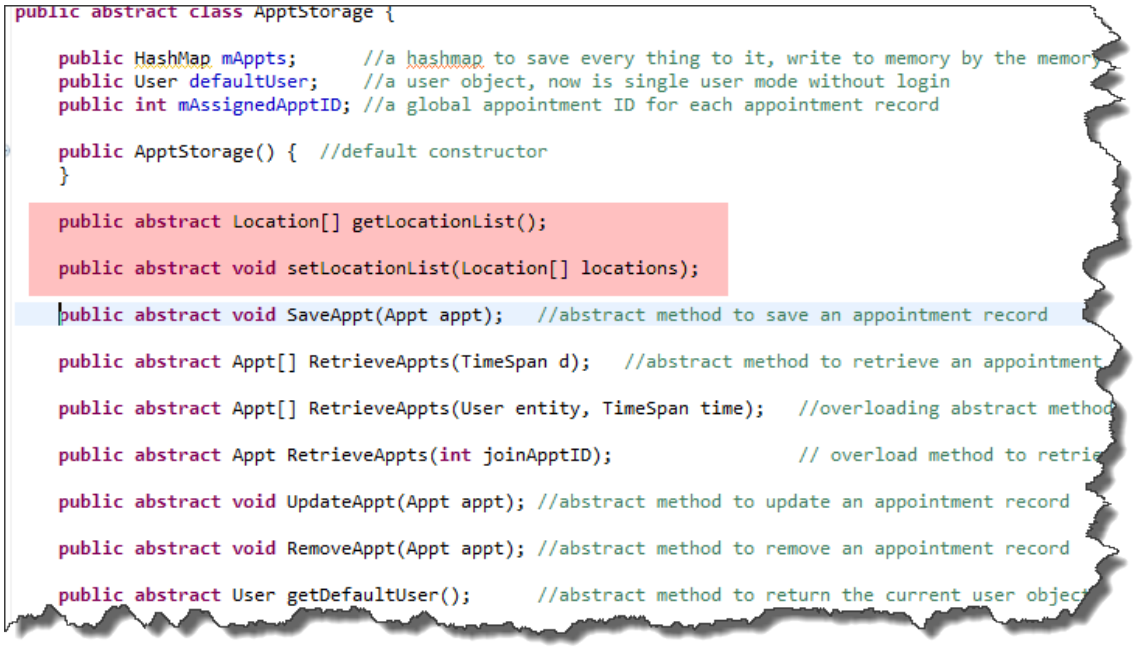


```
1  package comp211.calendar.unit;
2
3  public class Location {
4      private String _name;
5
6      public Location(String name) {
7          _name = name;
8      }
9
10     public String getName() {
11         return _name;
12     }
13
14     public void setName(String name) {
15         _name = name;
16     }
17
18
19 }
```

Add the code

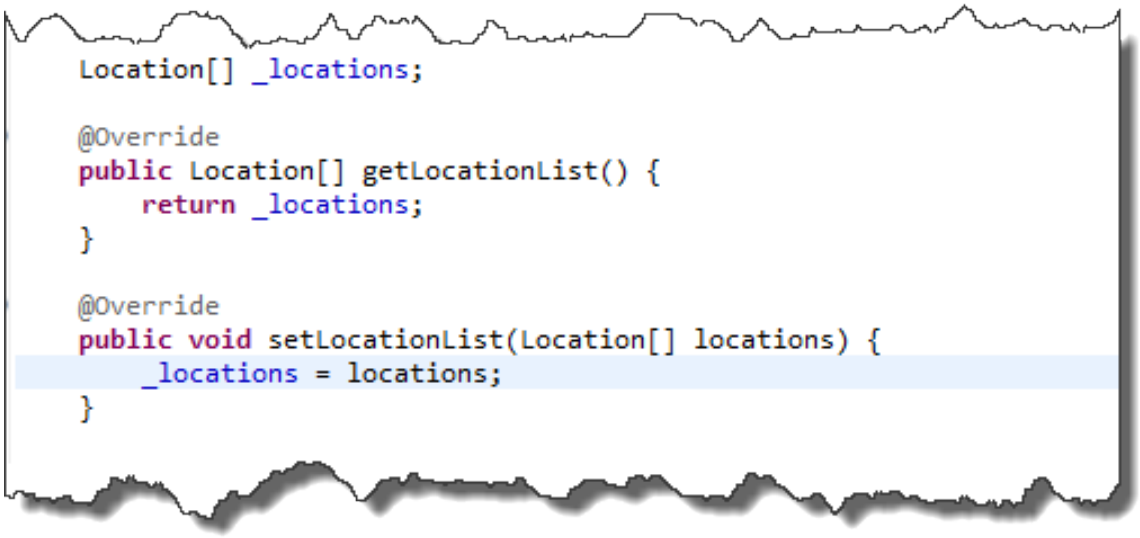
Implementing a Feature

- Add location information for event scheduling
  - Add a data structure to store the location
  - Implement the data storage for saving location data
  - Cate a dialog for manage locations
  - Create a menu entry for displaying the dialog
  - In the event creating GUI, Create a GUI element for choosing the location



```
public abstract class ApptStorage {

    public HashMap mAppts;      //a hashmap to save every thing to it, write to memory by the memory
    public User defaultUser;    //a user object, now is single user mode without login
    public int mAssignedApptID; //a global appointment ID for each appointment record

    public ApptStorage() {  //default constructor
    }

    public abstract Location[] getLocationList();

    public abstract void setLocationList(Location[] locations);

    public abstract void SaveAppt(Appt appt);   //abstract method to save an appointment record

    public abstract Appt[] RetrieveAppts(TimeSpan d);   //abstract method to retrieve an appointment

    public abstract Appt[] RetrieveAppts(User entity, TimeSpan time);   //overloading abstract method

    public abstract Appt RetrieveAppts(int joinApptID);                 // overload method to retrie

    public abstract void UpdateAppt(Appt appt); //abstract method to update an appointment record

    public abstract void RemoveAppt(Appt appt); //abstract method to remove an appointment record

    public abstract User getDefaultUser();      //abstract method to return the current user objec
```

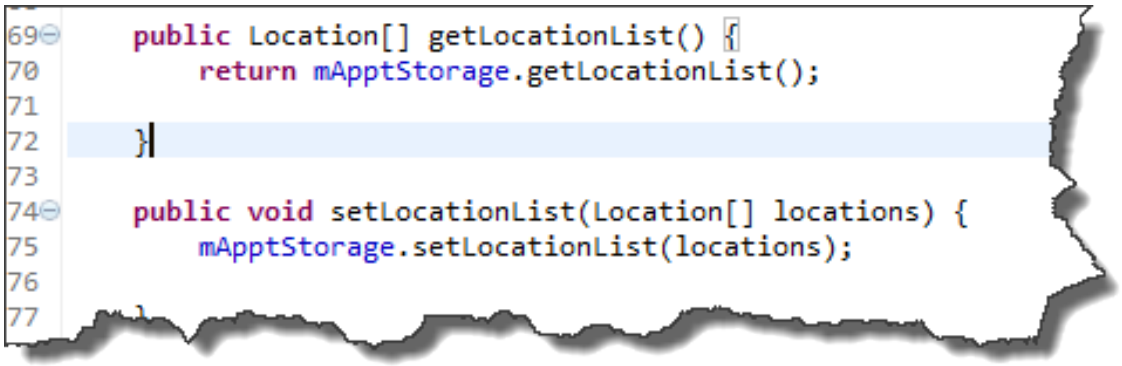
Add method to the ApptStorage class



```
Location[] _locations;

@Override
public Location[] getLocationList() {
    return _locations;
}

@Override
public void setLocationList(Location[] locations) {
    _locations = locations;
}
```

Add the implement the ApptStoragNullImpl

Change the class name if you don’t like the word “null”



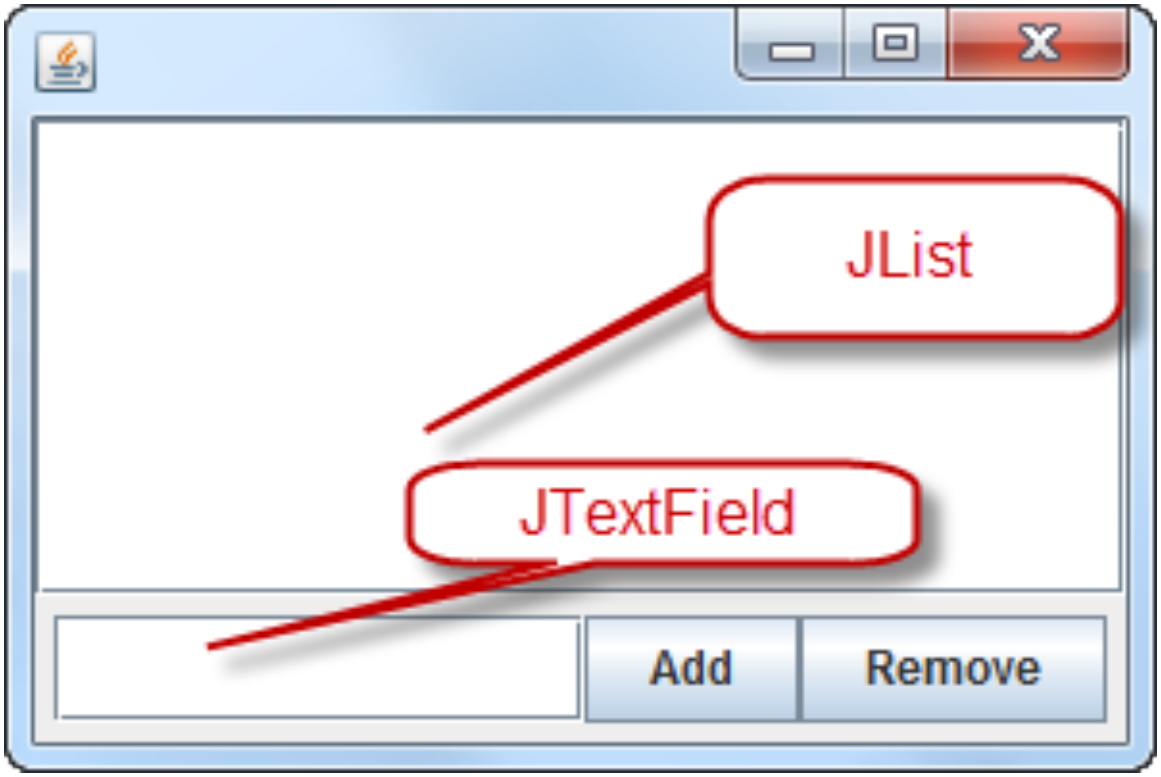
```
69      public Location[] getLocationList() {
70          return mApptStorage.getLocationList();
71
72      }
73
74      public void setLocationList(Location[] locations) {
75          mApptStorage.setLocationList(locations);
76
77
```

Also add new methods to the controller class

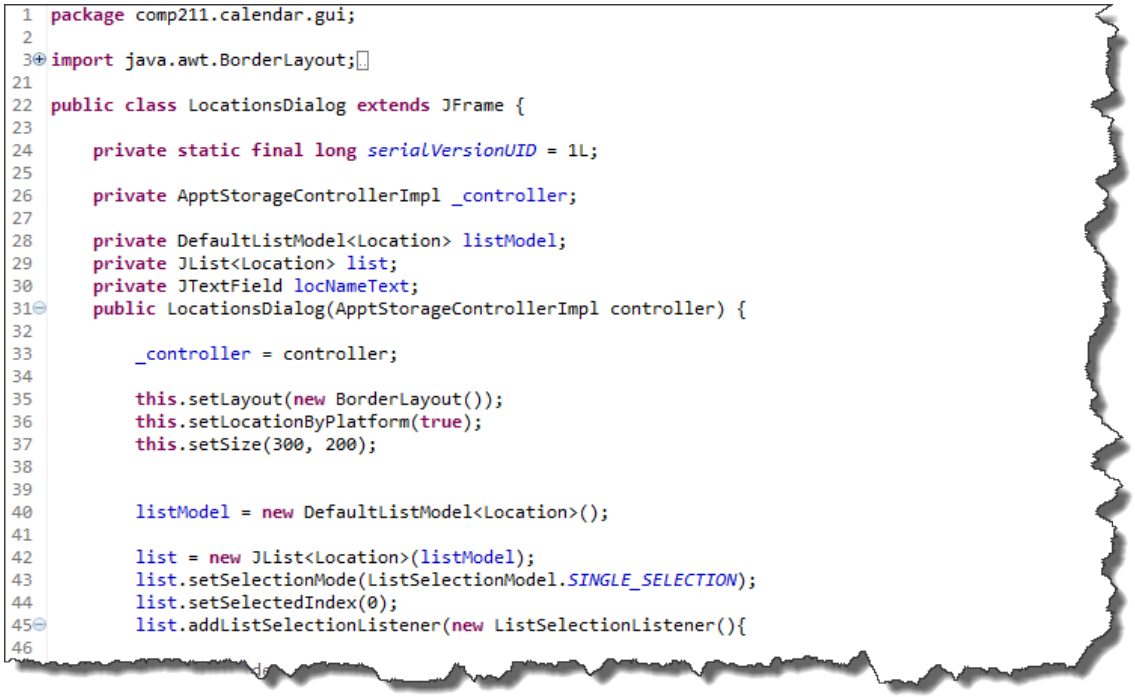
Route to the newly implemented methods

Implementing a Feature

- Add location information for event scheduling
  - Add a data structure to store the location
  - Implement the data storage for saving location data
  - Cate a dialog for manage locations
  - Create a menu entry for displaying the dialog
  - In the event creating GUI, Create a GUI element for choosing the location



We need a dialog looks like this



```
1  package comp211.calendar.gui;
2
3  import java.awt.BorderLayout;
21
22 public class LocationsDialog extends JFrame {
23
24     private static final long serialVersionUID = 1L;
25
26     private ApptStorageControllerImpl _controller;
27
28     private DefaultListModel<Location> listModel;
29     private JList<Location> list;
30     private JTextField locNameText;
31     public LocationsDialog(ApptStorageControllerImpl controller) {
32
33         _controller = controller;
34
35         this.setLayout(new BorderLayout());
36         this.setLocationByPlatform(true);
37         this.setSize(300, 200);
38
39
40         listModel = new DefaultListModel<Location>();
41
42         list = new JList<Location>(listModel);
43         list.setSelectionMode(ListSelectionModel.SINGLE_SELECTION);
44         list.setSelectedIndex(0);
45         list.addListSelectionListener(new ListSelectionListener(){
46
```

Create a new class LocationsDialog extending JFrame

Create the GUI

Manipulate the location data via calling the controller methods

Implementing a Feature

- Add location information for event scheduling
  - Add a data structure to store the location
  - Implement the data storage for saving location data
  - Cate a dialog for manage locations
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  - In the event creating GUI, Create a GUI element for choosing the location

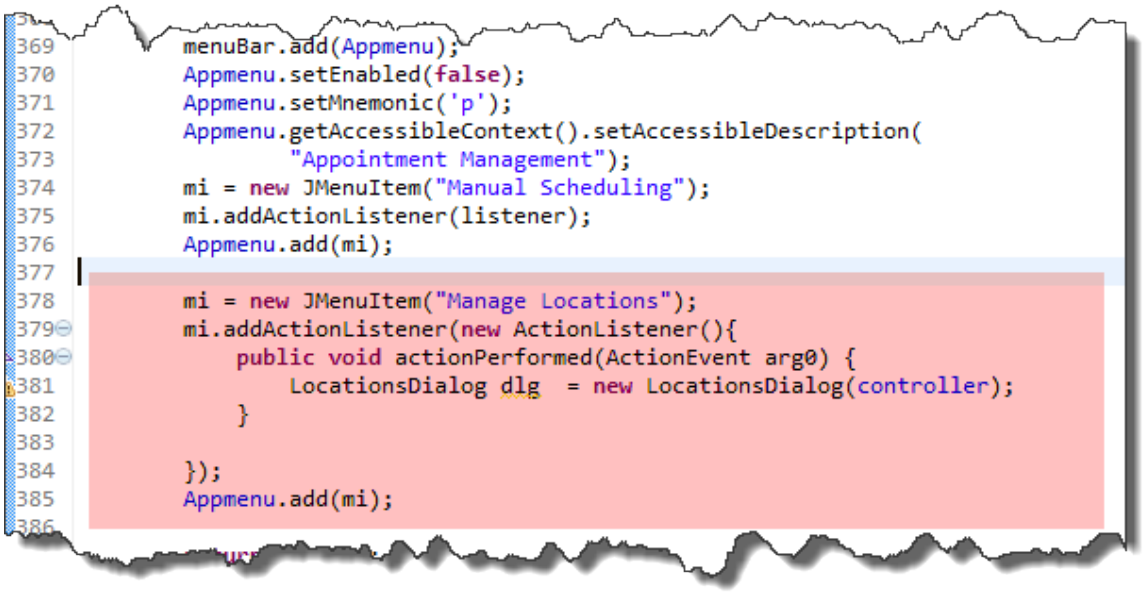
```
JMenuBar createMenuBar() {

    ActionListener listener = new ActionListener() {
        public void actionPerformed(ActionEvent e) {
            if (e.getActionCommand().equals("Manual Scheduling")) {
                AppScheduler a = new AppScheduler("New", CalGrid.this);
                a.updateSetApp(comp211.calendar.gui.Utility
                        .createDefaultAppt(currentY, currentM, currentD,
                                mCurrUser));
                a.setLocationRelativeTo(null);
                a.show();
                TableModel t = prepareTableModel();
                tableView.setModel(t);
                tableView.repaint();
            }

        }
    };
    JMenuBar menuBar = new JMenuBar();
    menuBar.getAccessibleContext().setAccessibleName("Calendar Choices");
```

Find the code for initializing the menu bar

- Open **CalGrid.java** in **comp211.calendar.gui**
- Navigate to **createMenuBar()** method.



```
369         menuBar.add(Appmenu);
370         Appmenu.setEnabled(false);
371         Appmenu.setMnemonic('p');
372         Appmenu.getAccessibleContext().setAccessibleDescription(
373                 "Appointment Management");
374         mi = new JMenuItem("Manual Scheduling");
375         mi.addActionListener(listener);
376         Appmenu.add(mi);
377
378         mi = new JMenuItem("Manage Locations");
379         mi.addActionListener(new ActionListener(){
380             public void actionPerformed(ActionEvent arg0) {
381                 LocationsDialog dlg  = new LocationsDialog(controller);
382             }
383
384         });
385         Appmenu.add(mi);
386
```

Add a new menu item under “Appointment Management”

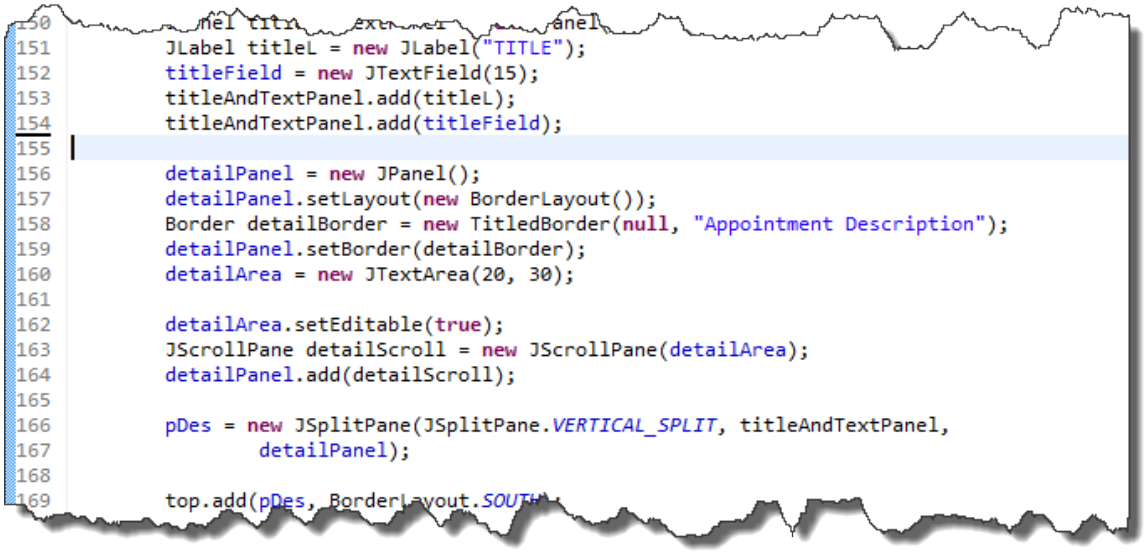
Related code is at the end of the slides

For creating menu entry

```
public class CalGrid extends JFrame implements ActionListener {
    …
    JMenuBar createMenuBar() {
        …
        mi = new JMenuItem("Manual Scheduling");
        mi.addActionListener(listener);
        Appmenu.add(mi);
        mi = new JMenuItem("Manage Locations");
        mi.addActionListener(new ActionListener() {
            public void actionPerformed(ActionEvent arg0) {
                LocationsDialog dlg  = new LocationsDialog(controller);
            }
        });
        Appmenu.add(mi);
        return menuBar;
    }
    …
}
```

Implementing a Feature

- Add location information for event scheduling
  - Add a data structure to store the location
  - Implement the data storage for saving location data
  - Cate a dialog for manage locations
  - Create a menu entry for displaying the dialog
  - In the event creating GUI, Create a GUI element for choosing the location



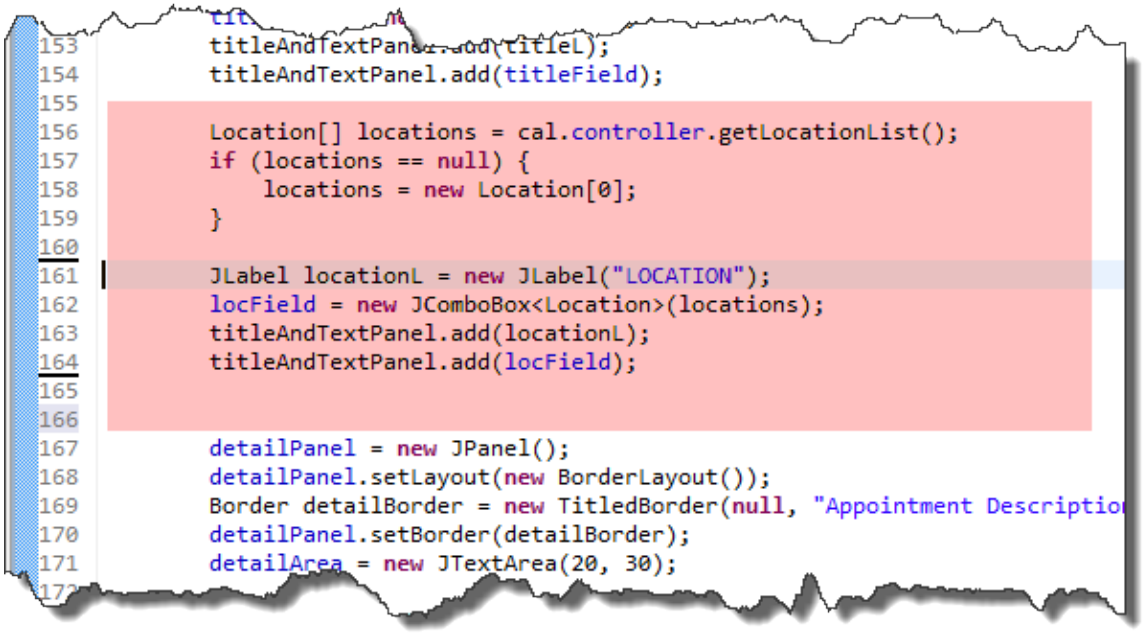
```
150         panel titlePanel = new JPanel();
151         JLabel titleL = new JLabel("TITLE");
152         titleField = new JTextField(15);
153         titleAndTextPanel.add(titleL);
154         titleAndTextPanel.add(titleField);
155
156         detailPanel = new JPanel();
157         detailPanel.setLayout(new BorderLayout());
158         Border detailBorder = new TitledBorder(null, "Appointment Description");
159         detailPanel.setBorder(detailBorder);
160         detailArea = new JTextArea(20, 30);
161
162         detailArea.setEditable(true);
163         JScrollPane detailScroll = new JScrollPane(detailArea);
164         detailPanel.add(detailScroll);
165
166         pDes = new JSplitPane(JSplitPane.VERTICAL_SPLIT, titleAndTextPanel,
167                 detailPanel);
168
169         top.add(pDes, BorderLayout.SOUTH);
```

Find the code for creating the GUI of event scheduling

In the **DetailsDialog** class

For creating the combo box

```
public class AppScheduler extends JDialog implements ActionListener, ComponentListener {
    …
    private JComboBox locField;
    private void commonConstructor(String title, CalGrid cal) {
        …
        titleAndTextPanel.add(titleField);
        Location[] locations = cal.controller.getLocationList();
        if (locations == null) {
            locations = new Location[0];
        }
        JLabel locationL = new JLabel("LOCATION");
        locField = new JComboBox(locations);
        titleAndTextPanel.add(locationL);
        titleAndTextPanel.add(locField);
        detailPanel = new JPanel();
        …
    }
    …
}
```



```
153         titleAndTextPanel.add(titleL);
154         titleAndTextPanel.add(titleField);
155
156         Location[] locations = cal.controller.getLocationList();
157         if (locations == null) {
158             locations = new Location[0];
159         }
160
161         JLabel locationL = new JLabel("LOCATION");
162         locField = new JComboBox<Location>(locations);
163         titleAndTextPanel.add(locationL);
164         titleAndTextPanel.add(locField);
165
166
167         detailPanel = new JPanel();
168         detailPanel.setLayout(new BorderLayout());
169         Border detailBorder = new TitledBorder(null, "Appointment Descriptio
170         detailPanel.setBorder(detailBorder);
171         detailArea = new JTextArea(20, 30);
```

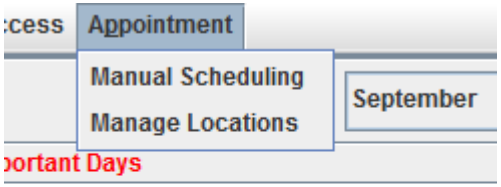
Create a combo box to select the location

On the **AppScheduler** class

Here we add it next to the TITLE field, in the same panel.

Related code is at the end of the slides

We're Done


ccess
Appointment
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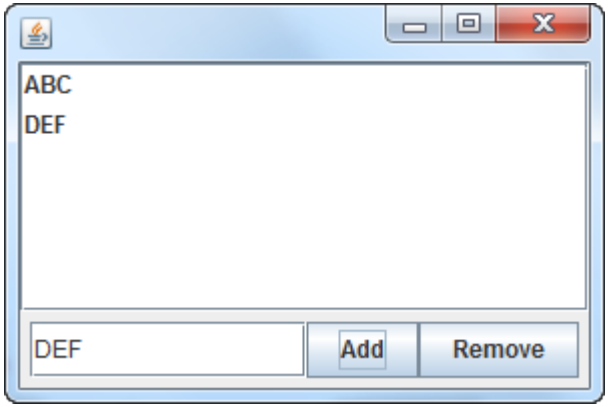
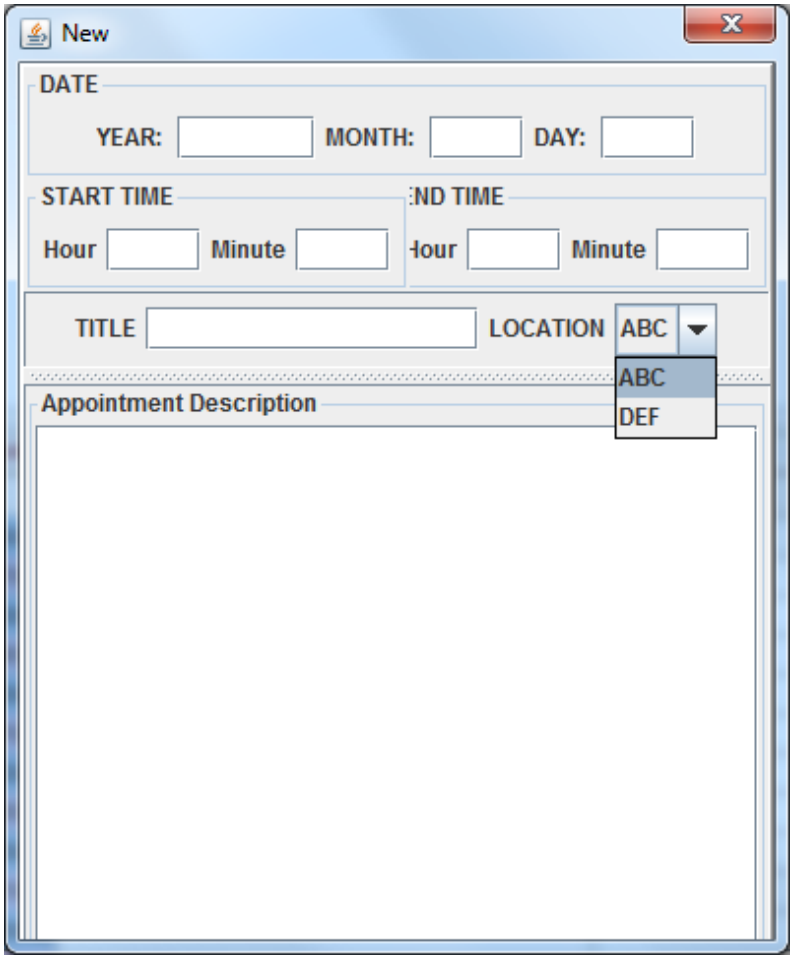

ABC
DEF
DEF
Add
Remove


New
DATE
YEAR:
MONTH:
DAY:
START TIME
Hour
Minute
END TIME
Hour
Minute
TITLE
LOCATION
ABC
ABC
DEF
Appointment Description

Some related Code