31244 Applications Programming
48024 Object Oriented Design
Assignment 2: Short Bay Prison GUI

Due date: Tuesday 27 October, 12:00 midday **Value:** 20%
Topics: Events, Swing, MVC
Objectives: This assignment supports subject objectives 1-5.

1. Individual work

This assignment is to be done individually. You should write every line of code, except for the supplied code. You are allowed to discuss ideas, approaches, and problems but you are not allowed to copy code from the web or from any person. Do not send your code to other people; it is an offence for a student to have a copy of someone else's assignment before the due date. The Faculty of Engineering and IT code of conduct is described in more detail in the subject outline.

2. Domain specification

Short Bay Prison is a boutique prison that holds at most 30 prisoners. It has one main building with 10 cells on the first floor and 10 cells on the second floor. A cell has an id of the form floor.number, such as 1.7 or 2.10. A cell has one or two bunks; even numbered cells have two bunks and odd numbered cells have one bunk.

There are nine types of crime at three levels:

1	drunk, littering, bad hair
2	fraud, theft, vandalism
3	murder, arson, assault

Prisoners at different levels cannot be in the same cell, where the level of a prisoner is the level of his or her crime. A prisoner is given a sentence and a cell when s/he enters the system.

3. Package structure

A base solution for the model can be downloaded from **Assignments/2/base**. This system contains only the code to add a criminal and allocate a cell; all the other code (including input validation and console IO) has been removed to make your task easier. You may add, change, or delete code in this solution as needed. The model code is in a **model** package in the BlueJ project that contains the GUI classes; see lab 10 for an example of this package structure.

4. GUI specification

The GUI is a tabbed panel; one panel adds a criminal and the other shows prison details. The tabbed panel appears at location (0, 500) on the screen. Snapshots of the two panels can be seen in **Assignments/2/snapshots**. Your GUI should be as close as possible to the snapshots. Do no validation; choose the period inputs so they are always valid.

4.1 The add panel

The add panel has data entry fields on the left, and buttons on the right. The data entry fields are the criminal name and the period: days, months, and years. Each field is labelled. The name field is 90x20, and the three period fields are 30x20; see Appendix A for details about how to set the sizes.

The top right has nine buttons in three rows of three. Level 3 crimes are shown on the top row, level 2 crimes in the middle row, and level 1 crimes in the bottom row. A button appears at bottom right labelled "Allocate cell". The user enters the criminal name and the period, selects the crime, and then clicks on the large button to add the criminal to the system and give him or her a cell. The input fields and the crime button are cleared after the criminal has been allocated a cell. Do no validation; choose your input data so it is correct. Only use names of less than a dozen characters.

4.2 The basic display panel

The basic display panel shows the number of prisoners at left and the cell allocations at right. The cell allocation is a scrollable table with 20 rows and 3 columns. The columns are headed "A", "B", and "C". The first column shows the id of each cell, and the other columns show the names of the prisoners in each cell. A cell with one bunk shows one name at most. A bunk without an owner is shown as a blank. The prisoner count and cell allocations must, of course, reflect the current state of the prison.

The size of the count display is 100x20. The size of the scrollable table is 220x150. The first column in the table has a width of 20.

4.3 The rich display panel

Extra marks are given for a richer display panel. The cell numbers are placed in a list; the size of a list element is 40x16, and the size of a table column is 70. When the user clicks on a cell (id) with occupants, a new window pops up at right (at location (400, 500)) to show the details of that cell. Clicking on a cell (id) that is empty does nothing.

The cell details window consists of a list and a button at bottom. The list shows

- The cell number, centred
- The bunk (only, top, or bottom), labelled
- The prisoner number and name, labelled
- The crime, labelled
- The start date, labelled
- The end date, labelled

Clicking the "Next bunk" button shows the data for the next bunk in the cell, if one exists. If there are no more bunks, or if the next bunk has no owner, then the list data is cleared. The button is centred in the window, with a strut of 50 on each side.

Clicking on the cell id may do nothing, or nothing immediately, if the network load is high.

5. Expected work load

This assignment has been estimated at a load of 18 hours for the average student who has completed all the tutorial and lab exercises. My solution to the basic GUI has about 100 lines of executable code, and about 160 lines for the richer GUI. This does not include the model code, and the GUI class and method headers or attributes.

6. Online support

An FAQ (Frequently Asked Questions) file is located at **Assignments/2/faq.** FAQs and their answers will be posted there as they arrive. If you have a question, check the FAQ first; it may already be answered there. You should read the FAQ at least once before you hand in your solution, but to be safe check it every couple of days. Anything posted on the FAQ is considered to be part of the assignment specification. The FAQ will be frozen (no new entries) two days before the due date.

The assignment was designed to simulate the job that you do as a programmer, but with a very small system. You should implement the spec, the whole spec, and nothing but the spec. If anything about the specification is unclear or inconsistent, then contact me and I will try to make it clearer by replying to you directly and posting the common questions and answers to the FAQ. This is similar to the job experience, where you ask your client (or boss) if you are unsure what has to be done, and then you write code to do the task. Email ***rist@it.uts.edu.au*** to ask for any clarifications or corrections to the assignment.

I cannot tell you how to design, write, or debug your code; that is your task. I cannot answer questions of the form "Is this right?"; I cannot "pre-mark" your design, or your code. There is no discussion board, because the assignment is a test of your individual ability to code a specification. It is a test, so it is not appropriate to share problems and solutions. The tutorials and labs provided a forum for discussion and an opportunity for feedback, using problems that are not assessed.

7. Assignment submission

To submit your assignment to PLATE, use the following steps:

1. Create a file of your BlueJ project; a zip or a jar file.
   To create a .jar file in BlueJ, in the system window go **Project** -> **Create Jar File**
   Click on **Include source** and enter **Prison**
   Click on **Include BlueJ files**
   Click on **Continue**
2. Go to **http://plate.it.uts.edu.au/**
3. Click on **Applications Programming -> Assessments -> Assignment 1**
4. Click on **Your Submission**
5. On this page, you will find a form to upload your submission as a zip or jar file.

After you have uploaded your zip or jar file, check the "Submitted files" list to make sure your Java files are really there. If there are no files listed, your jar or zip file was empty.

Make sure you include the BlueJ files, so I can run your submitted system. PLATE will accept your jar or zip file, but it will not give you a mark because it cannot mark a GUI system.

7.1 Late submission

A late submission loses 20 marks for each day, or part of day, late. As an example, submission received at 12:10 on the due date loses 20 marks. You may request an extension of up to five days if a problem arises (see the Subject Outline for valid reasons), but this must be arranged with the lecturer before the due date. A solution is not accepted after five days; it would get zero marks.

8. Notification of mark

I will post the marks to the UTSOnline Grade Center at most two weeks after the due date; I will email you when they are posted. Mark sheets with detailed item marks can then be picked up from the Student Centre in Building 10. I will email you if you are charged with Academic Misconduct, and the Academic Misconduct Committee will get in touch at some point.

9. Rough marking scheme

10	Input field format	10	Input button format
10	Allocate cell behaviour	5	Prisoner count
10	Correct use of MVC	15	Basic cell table
20	Cell id is clickable	20	Cell details

If your solution does not compile, then your maximum mark is 10/100.

9.1 Penalties

-10 Console IO

The system has a GUI interface and does no console IO. You may use the console window to show debugging output while you are developing your system, but you should remove any console IO from the final submitted version.

9.2 Minimum essential requirements

A pass can be obtained for a system that puts criminals in jail and shows the cell table.

Appendix A: Component sizes

The standard way to set the size of a component is with the `setPreferredSize` method. In some situations this does not work, so you have to set the preferred, minimum, and maximum sizes to the same value. The code looks like this:

```
    Dimension size = new Dimension(x, y);
    component.setPreferredSize(size);
    component.setMinimumSize(size);
    component.setMaximumSize(size);
```

See class `JComponent` for more details.