

CSE 1325-001
Course Project Phase 3
Archaeology
Assigned: November 5, 2014
Due: Week of November 24, 2014 (Nov 26)

This file is an assignment for a college course that includes class-based work. If this file should be submitted to a newsgroup or answer page, please contact me at becker@uta.edu. Thank you.

1. Instructions

Students are to complete the following assignment by writing a pair of Java programs. These programs need to be complete and able to run in order to receive full credit. All work, diagrams and programs, should include the student name, UTA id number, and the date. You will need to demonstrate your code to Dr. Becker, Mr. Robinson, or other Teaching Assistant.

The project may be done in teams of two. In order to do so, teams must remain together throughout all phases of the project. Students wishing to work as a team must submit their request to the instructor in an e-mail including both names and both UTA student ID numbers and a Team Name.

To turn in the Java code for this assignment, create a zip file of the working directory, and rename the file Phase3.TeamName.zip, where the TeamName is, of course, the name of your team. Then, upload this assignment to Blackboard. In addition, you must upload copies of any written documentation or diagrams to Blackboard.

2. Objective

The goal of this third phase is to cover the graphical components of the Java language, including

- Swing
- Mouse control
- Image Drawing
- Special Menus
- Special Dialogs
- UML Sequence Diagrams

2.1 Previous Objectives:

Phase 1 and Phase 2 of the project included this material:

- Use of basic data types
- Controls
- Simple concrete classes
- Files
- User Input
- Screen Output
- Exception handling

- Collection types
- Class Properties
- Inheritance
- Interfaces
- Polymorphism
- Static Members
- Exception Handling
- Beginning Graphical User Interface (GUI)
- Menus and Menu Items
- Basic Dialog
- Text Fields and Scrollbars
- The Subcontroller Concept
- UML Class Diagram

3. Problem

Create two programs: one will be a map creator program MPT (Map Population Tool), and the other will be a map reader program ADT(Archaeological Dig Tool). These programs are to be built in an Object-Oriented manner. In addition, two sequence diagrams must be created, one for each tool.

4. Diagram Instructions

For the Map Population Tool, create a sequence diagram for the adding of a second gold item. For the Archaeological Dig Tool, create a sequence diagram for digging in an area marked “Heritage”







5. The Graphical Update

Enough of both tools have been created with Phase 1 and Phase 2. Instead of adding more menu items, it is time to have more graphical components.

Instead of having text characters printed to the screen, a GridLayout of Components will be used instead. For example, a TileComponent can be created that is a part of the GUI, and the Tile Component can be assigned a graphic file to represent a symbol. As a result, the three types of maps (Feature, Boolean, and Count) have changed.

5.1 The Feature Map

The Feature Map has the characters for the types of finds replaced with a colored tile to represent the various types. As before, each feature can be unexcavated or excavated.

| Feature | Unexcavated | Excavated |
|------------------|---|--|
| Natural |  |  |
| Post hole or pit |  |  |
| Stonework |  |  |

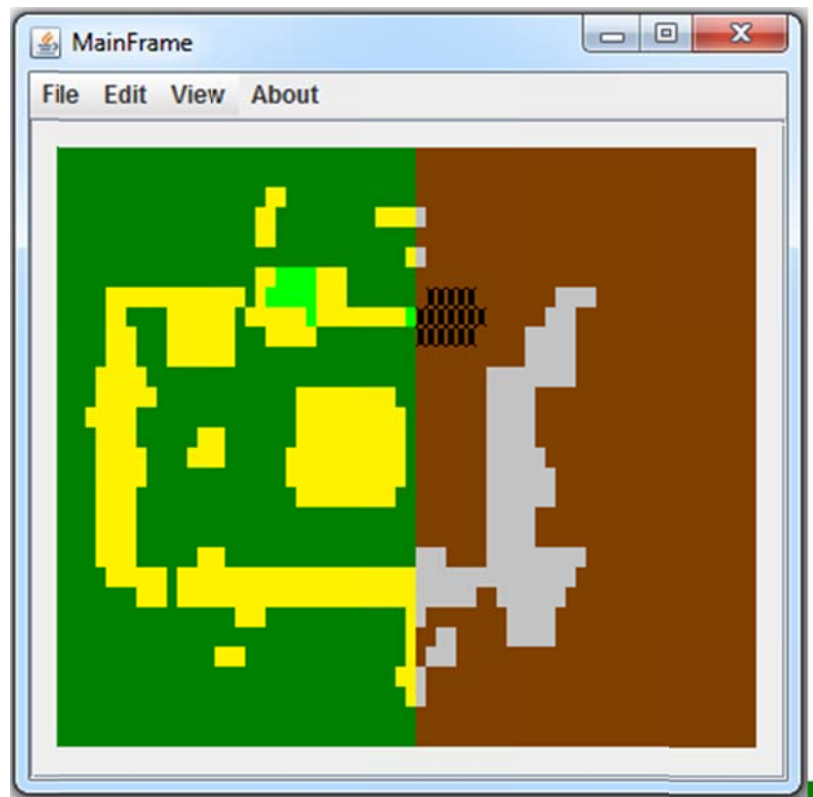


Figure 1. Tikal with half of the features excavated.

5.2 The Boolean Map

The Boolean Map has the characters for true, false, and unscanned replaced with a black tile or a white tile to represent the various types excavated. A gray tile marks an area as being unscanned with a Geophysical instrument. As before, each square can be scanned, and have a true or false response. In addition, a unknown symbol must exist to replace the whitespace on the character map.

| Value | Symbol |
|-----------|--------|
| True | □ |
| False | ■ |
| Unscanned | ■ |

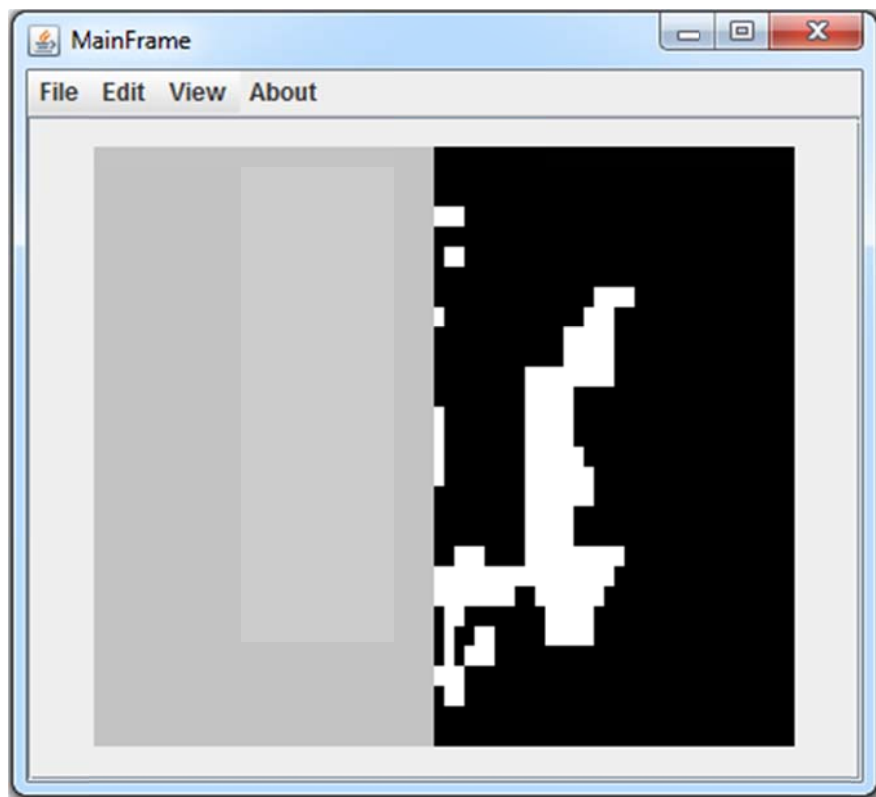


Figure 2. Tikal with half of the features scanned with Magnetometer (Charcoal)

5.2 The Count Map

The Count Map has the characters for the number of finds replaced with a colored tile to represent the number of the type(pottery, charcoal, metal) found in an area. As before, each square can be dug, and have a colored tile to represent the number of finds. In addition, a unknown symbol must exist to replace the whitespace on the character map.

| Value | Symbol |
|-------|--------|
| 0 | |
| 1 | ■ |
| 2 | ■ |
| 3 | ■ |
| 4 | ■ |
| 5 | ■ |
| 6 | ■ |
| 7 | ■ |
| 8 | ■ |
| 9 | ■ |
| Undug | ■ |

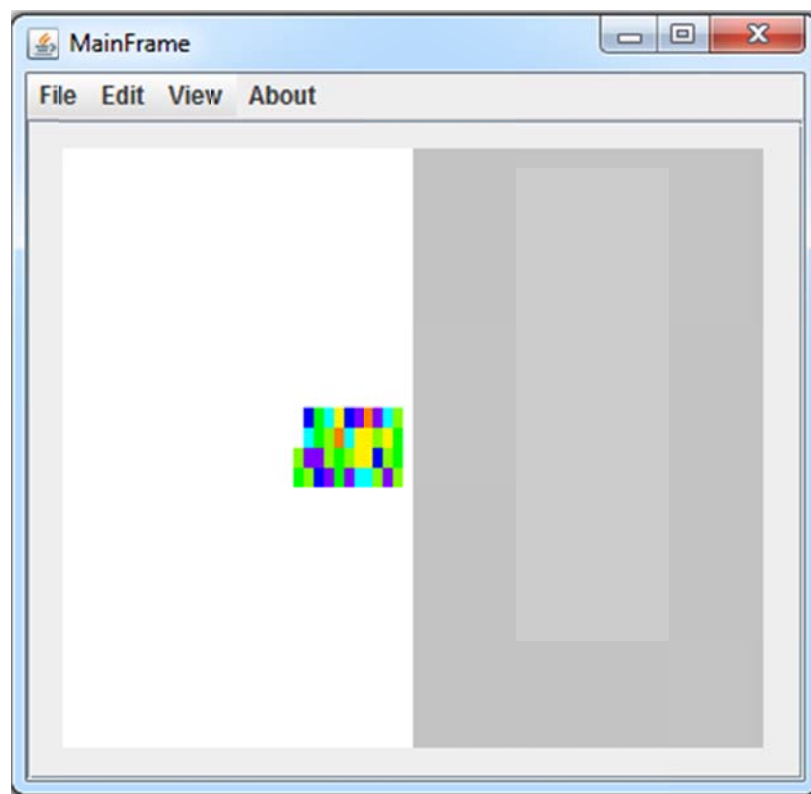


Figure 3. Tikal with half of the site dug with a Pottery Count

6. The Mouse Update

Punching in rows and columns is hard to use, hard to see, and worse, **boring**. Instead of putting in rows and columns, the same sequence can be done by using the mouse. This time, your program can select an area on the map, and then a right-click will open a pop-up menu. This can be done by working out co-ordinate systems, or by having each Tile component be a GUI component that can listen for a mouse-click. The row and column for the activity should come from the calculations from the mouse instead of from a dialog box.

| Map Population Tool Pop Up | Archaeological Dig Tool Pop-Up |
|---|--|
| Set Feature Toggle Excavated Toggle Heritage Add Metal Find Add Pottery Find Add Charcoal Find | Scan Map Square with Magnetometer Scan Map Square with Metal Detector Dig Map Square |

7. Update Previous features

All previous features must be active in the tools. For the Map Excavation Tool, this will include the following components.

On MPT

- Load File: The Load must use the Swing JFileDialog
- Save File: The Save must use the Swing JFileDialog
- Single Item of Gold: A message dialog must report that the gold item has been replaced.
- The About button: The About button must open a message dialog with the same information.

On ADT:

- Load File: The Load must use the Swing JFileDialog
- Save File: The Save must use the Swing JFileDialog
- Heritage Exception: A message Dialog must report the attempt to dig a heritage area
- Age-of-Site Report: A dialog box with a text area should now show the Finds report.
- The About button: The About button must open a message dialog with the same information.

Bonus Features: 25 Points

Better Tiles (5 points)

The tiles on the map are small, rectangular, and quite plain. They are created to mimic the Courier New Font with a pixel size of 10 pixels tall by 5 pixels wide. Modern digital art tools are capable of so much more. Make larger, more beautiful tiles to put on the map. Aesthetics count for these points.

Open up a trench (5 points)

Instead of doing a single square at the time, use the Drag function of the mouse to define multiple squares to be processed. Do this both for Scanning and for Excavating.

Five Archaeologist Threads (15 points)

Create threads, where each thread represents an archaeologist assigned to excavate one or more grid squares. Let each grid square take a time of 10 seconds to dig. Have the ability to launch, as independent threads, up to 5 Archaeologists: Schliemann, Carter, Bingham, Thompson, and Robinson. At the end of each thread, the program should pop up a window that explains who the thread is, and what they found on their dig.