Worksheet

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Design:

1) The model from a user's perspective is a set of 6 panorama images at 6 locations (Junction, DHT, GS, CrS, ChS, TCS). The user can turn on the spot using Left and Right arrows and then use the Forward arrow to move to another location. Pick up and Put Down menus can be used to control the 4 Pickables. A map and a text box provide additional information.
2) The design is highly modular and makes use of several OOPs principles. The main Classes are, the Viewer Class which implements the interface PhotoViewer and the WorldController Class which implements the interface PhotoController.
3) The Viewer handles GUI interaction, output (display text, images, disabling menu items, etc.) and input (click handling, menu selections).
4) The WorldController controls the operation of the system. It further interacts with Class Frame and Class Pickable. These classes have several instances.
5) Class Pickable and Frame support encapsulation of data and functions with regard to Pickable items and frames respectively.
6) World Controller initialises Pickable, gets and sets it's properties (like image, frameNo, pixelNo, etc.) and request for it to be picked up or put down. Pickable does not access any functions of WorldController thereby avoiding too tight coupling.
7) World Controller initialises Frame, gets and sets it's properties (like image, neighbouring frames, etc.). Again, Frame does not use any functions of WorldController
8) Viewer does access functions of WorldController and Pickable, also WorldController access functions of Viewer however the separation was necessary for testing. A test file also implements PhotoViewer and substitutes the Viewer during tests.
9) To make the implementation more efficient, the code readable and to add to the abstraction, other classes were used to enable easy switching between functions, providing a design similar to a Strategy Pattern. GetFrame and ToFrame are two such superclasses.
10) GetFrame abstracts the selection of an adjoining frame when the forward button is pressed. It's subclasses are GetRight, GetLeft, GetBack and GetFront.
11) ToFrame abstracts the route to a location while testing. It's subclasses are ToDHT, ToGS, ToCrS, ToChs and ToTCS.

Implementation:

1) ArrayLists are used to store most Pickables and Frames as it allows addition easily. Also since the indexing is through numbers, it has the same access speed as a Hashtable but takes less memory (depending or usage).
2) HashTables are used in certain places, like in viewer where the string needs to be used as index. It is faster than searching through an ArrayList.
3) The FXML is linked to the viewer. The viewer initialises the controller and passes it itself. The controller access functions of the viewer for output functions while the viewer accesses controller functions for input.
4) The controller instantiates Pickables and Frames and initialises maps and arrows. It reads from image files and stores the panorama images in memory.

5) Only a part of the panorama is displayed based on the x_coord. Turning around on the spot uses the same frame and no separate object for every pane. A simple modulo operator is used to control. This approach was taken to facilitate more panes per frame.

Tests

1) Sees that on init the code starts from the correct location
2) Sees that every location on the map is accessible, see that it has the correct map and text also check that on rotation the same point is reached from which we started
3) Sees that every pickable item can be picked checks visibility, whether the pick up and put down menu have been correctly enabled.

Graphical User Interface:

1) Buttons are disabled R and L are always applicable, F is disabled in incorrect panes, it is enabled and directed to an existing pane otherwise.
2) When an object is picked, that object is removed from the pick menu and enabled on the put down menu.
3) When an object is put down the reverse is done.
4) Also, the pickables disappear when user in in a pane or frame that they are not in. The pick menu items get disabled except for the ones in that pane.
5) The put menu only shows the items that are currently held. Thus this can be used to check what items are held.
6) A map shows the top view of the scene. Each block is a location, by default they are blue, they turn red when they are the current frame.
7) A text box shows the name of the current location.