

Note: There are five questions in all. Please answer all parts of a question in sequence and in continuation.

Q1. In the *Figure 1* a Graphical User Interface (GUI) design of a system to enter the date and time of vehicle entry and exit in or out of some premises via a single gate. Each grid-cell is 10x10 pixels. The *Figure 2* shows a view (at run-time) of the dialog of the GUI design of *Figure 1*. The function of each control is:

Vehicle In/Out: user can select whether the vehicle is entering in (by selecting the radio button 'in') or going out (by selecting the radio button 'out').

Vehicle Number: Against this the vehicle number should be entered and if the vehicle is going out then this vehicle must have been entered in recent past and after that until the time of this exit it was inside the premises.

Date: Date of the vehicle movement (in or out as the case may be) is being recorded. After the vehicle number entry the date is set to current system date.

Time: Time on the date when the vehicle movement (in or out as the case may be) is being recorded.

Save: Clicking 'Save' will save the vehicle movement details in the database and all fields (except Vehicle In/Out, and the date) are blanked.

Reset: Clicking 'Reset' will swap the selection of radio button 'in' or 'out' and focus moves to enter vehicle number. The date is set to current system date.

Exit: Clicking 'Exit' the user can exit without making any changes to the database after the latest 'Save'.

The default order of entry (i.e. default tab order) is Vehicle In/Out, Vehicle Number, Year, Month, Day, Hour, Minute, Second, Save and then back to Vehicle Number.

Answer the following:

- 1.1 Write two disadvantages of the design as a whole.
- 1.2 Write two advantages of the design as a whole.
- 1.3 Suggest and draw a better design.
- 1.4 Suggest a better interaction as per the better design suggested by you.
- 1.5 Using Fitt's law and for the given design and functionality, reason if the use of 'Reset' after 'Save' is preferred over changing selection of 'In' or 'Out' and then focusing cursor for entering vehicle number.

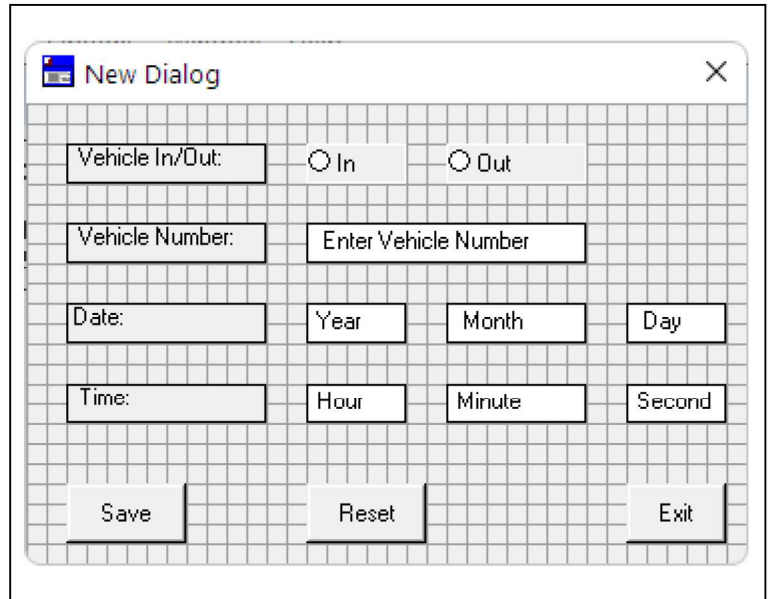


Fig. 1: Vehicle Movement GUI (Design Time)

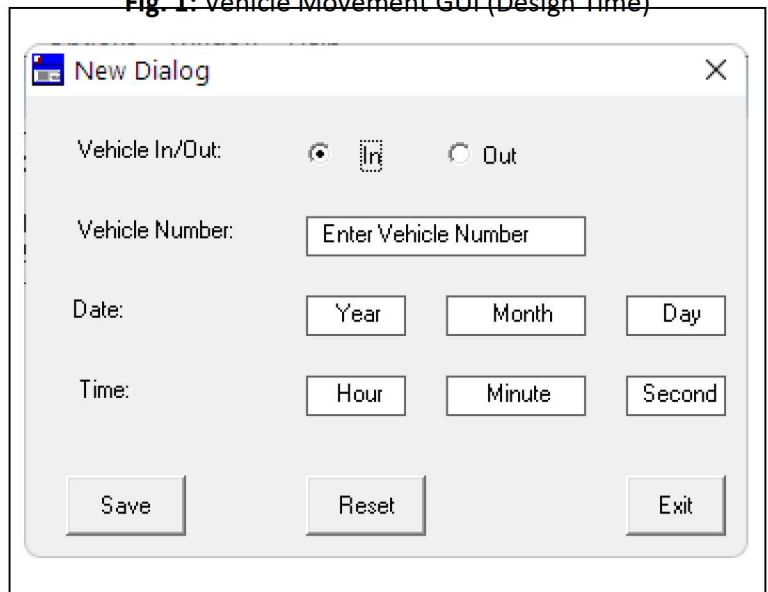


Fig. 2: Vehicle Movement GUI (Run Time)

Marks Q1 [2 x 5 = 10]

Q2. Answer the following briefly:

- 2.1 Write two functions of the rod shaped cells in the retina.
- 2.2 Which organ of internal ear help us to distinguish sounds of various frequencies and how?
- 2.3 What is weber's law and what is its implication in functioning of the Human Visual System?

Marks Q2 [2 x 3 = 6]

Q3. Assume that a user interface accepts three values integer x, y and z in the range [-16, 16], [-16, 16] and [-40, 40] respectively. The interface should list x, y, z values when the user clicks mouse at a point falling on the helix and a designer design this interface using a graphics control similar to the one shown in *Figure Q3*. Answer the following:

- 3.1 State which three design principles are more significant for this design and why these are more significant as compared to the others?
- 3.2 List three difficulties to implement this type of design.

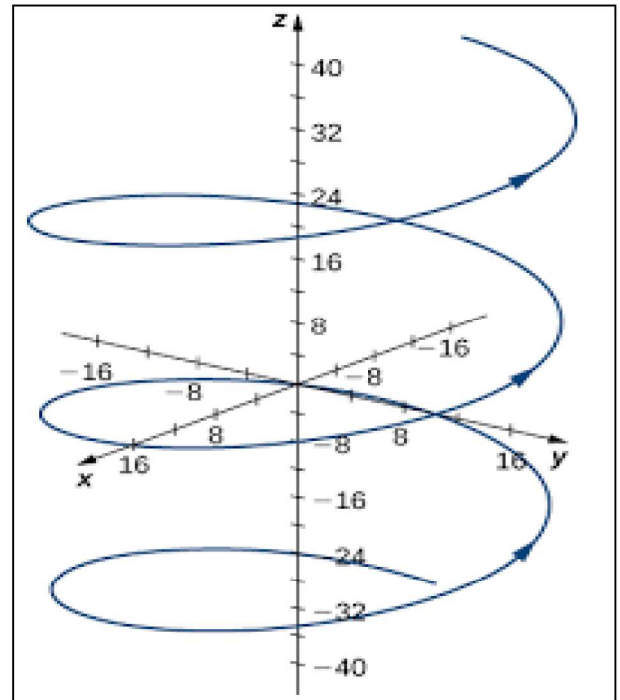


Figure: Q3

Marks Q3 [3 + 3 = 6]

Q4. The *Figure Q4* is an interface design for a touch-based piano, if screen is touch-screen enabled or the system has a touchpad else mouse-click based piano. Playing a piano-key will generate appropriate sound and color of the played key is also changed for around 100 ms. If user constantly presses the key there is no sound i.e. sound is generated only when once the screen is touched (or any mouse button is clicked or touchpad is touched) and finger is immediately (say within 150 ms) removed from the screen/touchpad/mouse-button. Describe this interface in the terms of the framework proposed by Abowd and Beale.

Marks Q4 [3]

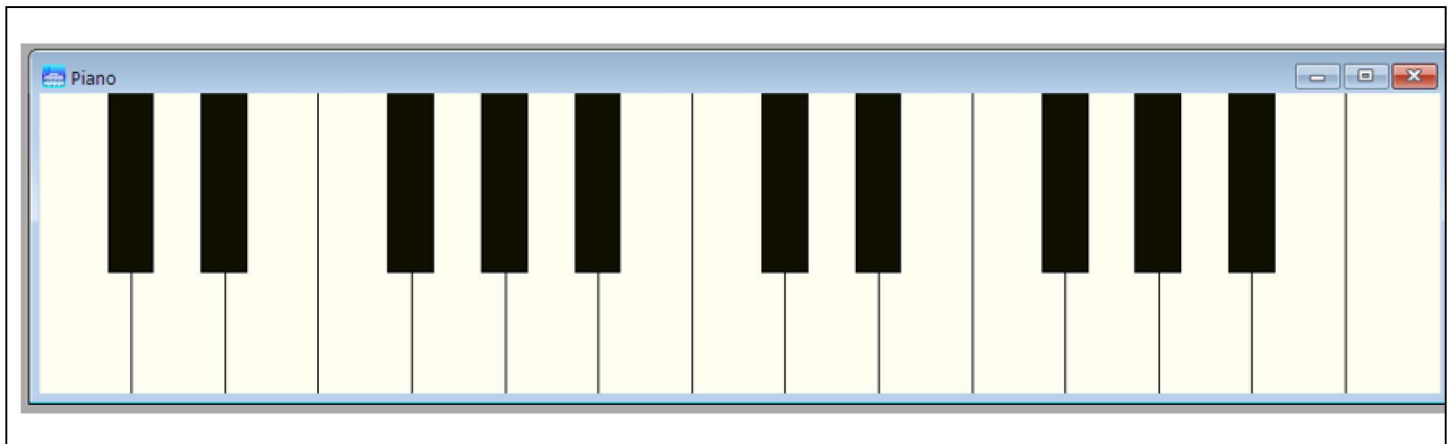


Fig. Q4: Piano Interface

Q5. Write (in two sentences for each) about various ways of interaction-evaluation by the experts. Also state (one sentence for each Heuristic) the ten Heuristics useful for this purpose.

Marks Q5 [2.5 + 2.5 = 5]