Internal Assessment Test 3 –January 2021 Scheme and Solutions

Sub: User Interface Design Sub Code: 18CS734 Branch: ISE
Date: 27/1/2022 Duration: 90 min's Max Marks: 50 Sem/Sec: VII A, B &C

Answer any FIVE FULL Questions

1. Explain the components of a window in detail?
Solution:

Frame

- A window will have a frame or border, usually rectangular in shape, to define its boundaries and distinguish it from other windows.
- While a border need not be rectangular, this shape is a preferred shape for most people.

Title Bar

- The title bar is the top edge of the window, inside its border and extending its entire width.
- This title bar is also referred to by some platforms as the *caption, caption bar,* or *title area*.
- The title bar contains a descriptive title identifying the purpose or content of the window.

Title bar Icon

- Located at the left corner of the title bar in a primary window, this button is used in Windows to retrieve a pull-down menu of commands that apply to the object in the window.
- It is 16 X16 version of the icon of the object being viewed.

Window Sizing Buttons

- Located at the right corner of the title bar, these buttons are used to manipulate the size of a window.
- The leftmost button, the *minimize* button— inscribed with a short horizontal line toward the bottom of the button—is used to reduce a window to its minimum size, usually an icon. It also hides all associated windows.
- The *maximize* button—typically inscribed with a large box—enlarges a window to its maximum size, usually the entire screen. When a screen is maximized, the *restore* button replaces the maximize button, since the window can no longer be increased in size.

- When these buttons are displayed, use the following guidelines:

    - When a window does not support a command, do not display its command button.
    - The *Close* button always appears as the rightmost button. Leave a gap between it and any other buttons.
    - The *Minimize* button always precedes the *Maximize* button.
    - The *Restore* button always replaces the *Maximize* button or the *Minimize*
    - button when that command is carried out.

What's This? Button

- The *What's This?* Button, which appears on secondary windows and dialog boxes, is used to invoke the What's This?
- Windows command to provide contextual Help about objects displayed within a secondary window.

Menu Bar

- A menu bar is used to organize and provide access to actions. It is located horizontally at the top of the window, just below the title bar.
- A menu bar contains a list of topics or items that, when selected, are displayed on a pull-down menu beneath the choice.

Status Bar

- Information of use to the user can be displayed in a designated screen area or areas. They may be located at the top of the screen in some platforms and called a *status area*, or at the screen's bottom.
- Microsoft recommends the bottom location and refers to this area as the *status bar.* It is also referred to by other platforms as a *message area* or *message bar*.

Scroll Bars

- When all display information cannot be presented in a window, the additional information must be found and made visible.
- This is accomplished by scrolling the display's contents through use of a scroll
    - bar.
- A scroll bar is an elongated rectangular container consisting of a scroll area or shaft, a slider box or elevator, and arrows or anchors at each end.
- For vertical scrolling, the scroll bar is positioned at the far right side of the work

Split Box

- A window can be split into two or more pieces or panes by manipulating a *split box* located above a vertical scroll bar or to the left of a horizontal scroll bar.
- A split box is sometimes referred to as a *split bar*.
- A window can be split into two or more separate viewing areas that are called *panes*

Toolbar

- Toolbars are permanently displayed panels or arrays of choices or commands that must be accessed quickly. They are sometimes called *command bars*.
- Toolbars are designed to provide quick access to specific commands or options.
- Specialized toolbars are sometimes referred to as *ribbons, toolboxes, rulers,* or *palettes*.

Command Area

- In situations where it is useful for a command to be typed into a screen, a command area can be provided.
- The desired location of the command area is at the bottom of the window.

Size Grip

- A size grip is a Microsoft Windows special handle included in a window to permit it to be resized.

- When the grip is dragged the window resizes, following the same conventions as the sizing border. Three angled parallel lines in the lower-right corner of a window designate the size grip.

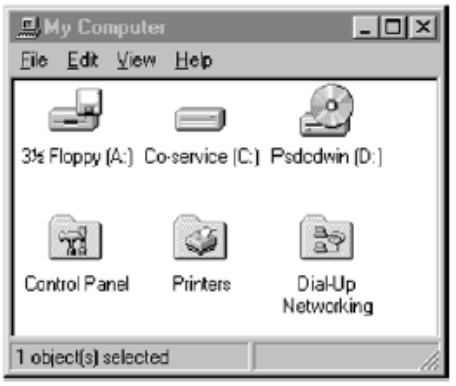
Work Area

- The work area is the portion of the screen where the user performs tasks.
- It is the open area inside the window's border and contains relevant peripheral screen components such as the menu bar, scroll bars, or message bars.
- The work area may also be referred to as the *client area*.

2. Briefly discuss the types of windows with examples (Any four)?

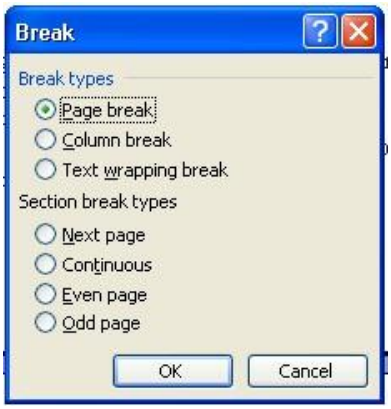
Solution :

Primary Window



- Proper usage:
  - Should represent an independent function or application.
  - Use to present constantly used window components and controls.
    - Menu bar items that are:
  - Used frequently.
  - Used by most, or all, primary or secondary windows.
    - Controls used by dependent windows.
  - Use for presenting information that is continually updated.
    - For example, date and time.
  - Use for providing context for dependent windows to be created.
  - Do not:
    - Divide an independent function into two or more primary windows.
    - Present unrelated functions in one primary window.
- It has also been variously referred to as the *application* window or the *main* window. In addition, it may be referred to as the *parent* window if one or more *child* windows exist

Secondary Windows


Break
Break types
Page break
Column break
Text wrapping break
Section break types
Next page
Continuous
Even page
Odd page
OK
Cancel

- Proper usage:
    - For performing subordinate, supplemental, or ancillary actions that are:
        - Extended or more complex in nature.
        - Related to objects in the primary window.
    - For presenting frequently or occasionally used window components.
- Important guidelines:
    - Should typically not appear as an entry on the taskbar.
    - A secondary window should not be larger than 263 dialog units x 263 dialog units.
- A *dependent* secondary window is one common type. It can only be displayed from a command on the interface of its primary window. It is typically associated with a single data object, and appears on top of the active window when requested. It is movable, and scrollable.
- An *independent* secondary window can be opened independently of a primary window—for example, a property sheet displayed when the user clicks the Properties command on the menu of a desktop icon.

Modal and Modeless

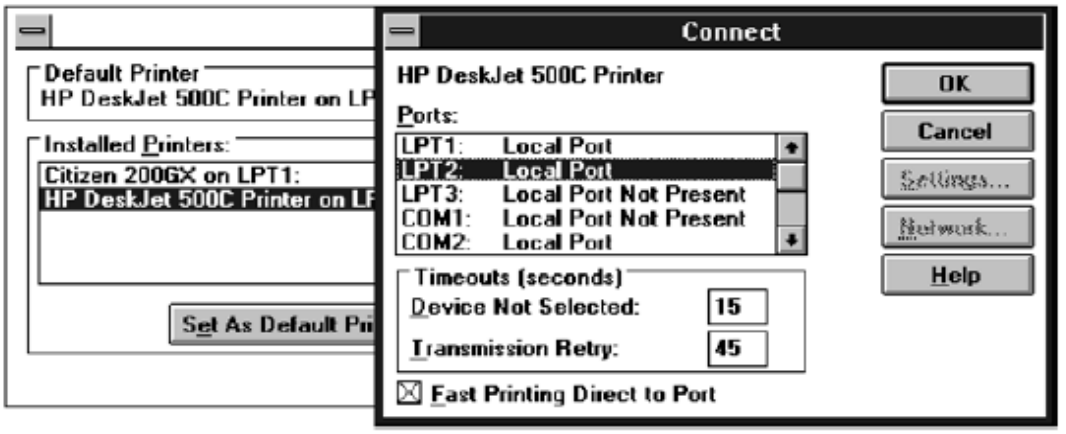
- Modal:
    - Use when interaction with any other window must not be permitted.
    - Use for:
        - Presenting information.
    - For example, messages (sometimes called a message box).
        - Receiving user input.
    - For example, data or information (sometimes called a prompt box).
        - Asking questions.
    - For example, data, information, or directions (sometimes called a question box).
    - Use carefully because it constrains what the user can do.
- Modeless:
    - Use when interaction with other windows must be permitted.
    - Use when interaction with other windows must be repeated.

Cascading and Unfolding

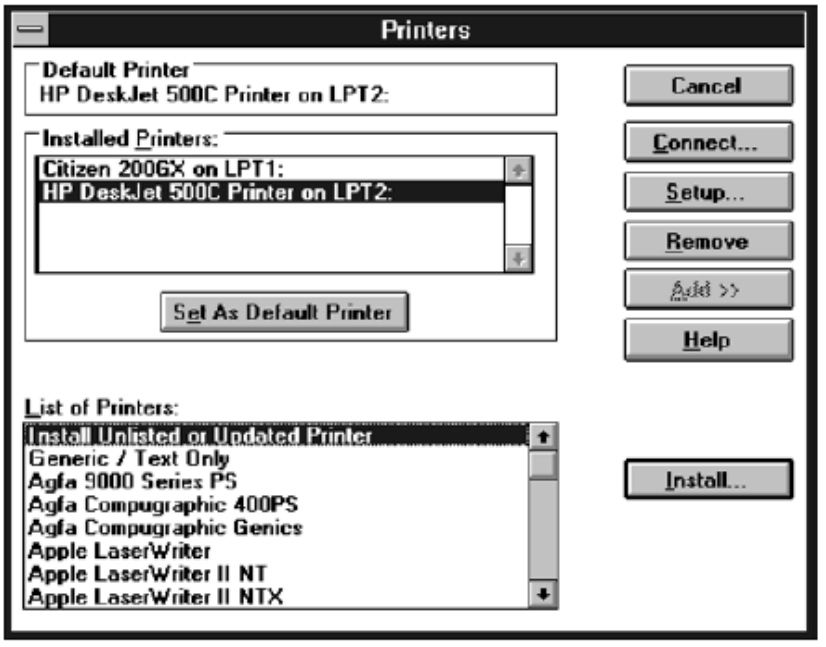
- Cascading:
    - Purpose:
        - To provide advanced options at a lower level in a complex dialog.
    - Guidelines:
        - Provide a command button leading to the next dialog box with a “To Window” indicator, an ellipsis (. . .).
        - Present the additional dialog box in cascaded form.
        - Provide no more than two cascades in a given path.
        - Do not cover previous critical information.

- Title Bar.
- Relevant displayed information.
  - If independent, close the secondary window from which it was opened.

- Unfolding:
  - Purpose:
    - To provide advanced options at the same level in a complex dialog.
  - Guidelines:
    - Provide a command button with an expanding dialog symbol (>>).
    - Expand to right or downward.

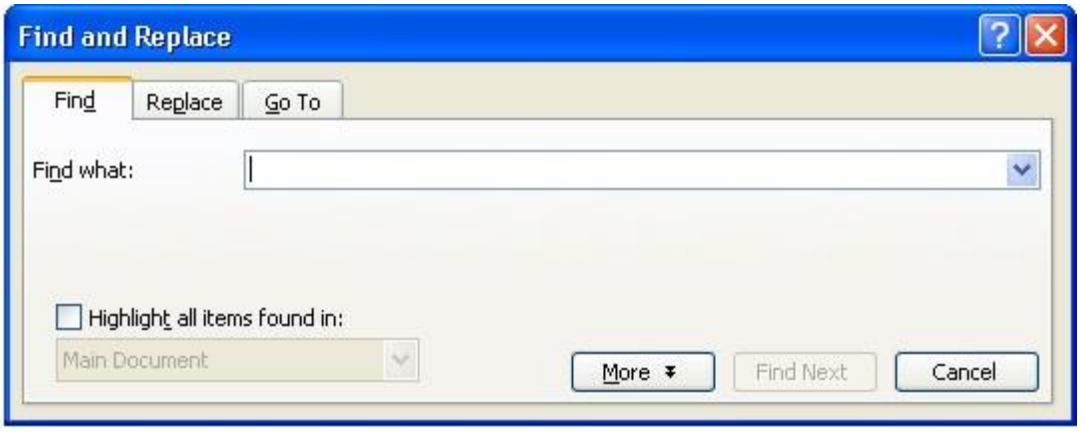


Cascaded Window



Unfolded Window

Dialog Boxes

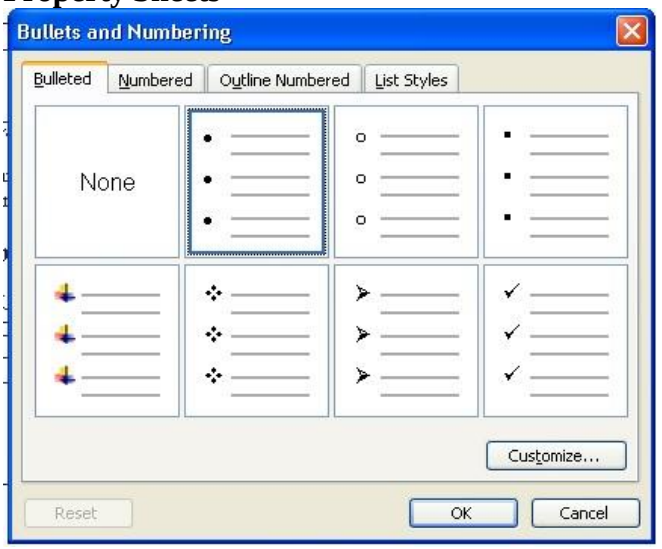


- Use for presenting brief messages.
- Use for requesting specific, transient actions.
- Use for performing actions that:
  — Take a short time to complete.
  — Are not frequently changed.
- Command buttons to include:
  — OK.
  — Cancel.
  — Others as necessary.

Property Sheets and Property Inspectors

Secondary windows provide two other techniques for displaying properties, *property sheets* and *property inspectors.*

Property Sheets



- Use for presenting the complete set of properties for an object.
- Categorize and group within property pages, as necessary.
  — Use tabbed property pages for grouping peer-related property sets.
  — The recommended sizes for property sheets are:
    • 252 DLUs wide x 218 DLUs high
    • 227 DLUs wide x 215 DLUs high
    • 212 DLUs wide x 188 DLUs high
  — Command buttons to include:
    • OK.
    • Cancel.
    • Apply.
    • Reset.
    • Others as necessary.
  — For single property sheets, place the commands on the sheet.
  — For tabbed property pages, place the commands outside the tabbed pages.

Property Inspectors

- Use for displaying only the most common or frequently accessed objects properties.
- Make changes dynamically.

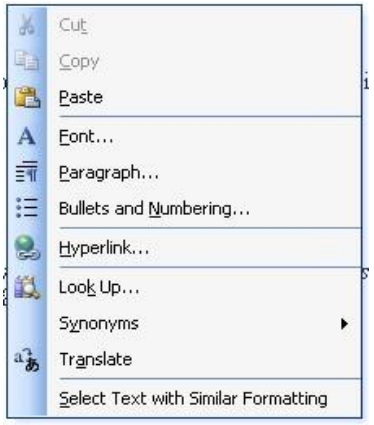
Message Boxes

- Use for displaying a message about a particular situation or condition.
- Command buttons to include:
  — OK.
  — Cancel.
  — Help.
  — Yes and No.
  — Stop.
  — Buttons to correct the action that caused the message box to be displayed.
- Enable the title bar close box only if the message includes a cancel button.
- Designate the most frequent or least destructive option as the default command

Palette Windows

- Use to present a set of controls.
- Design as resizable.
  — Alternately, design them as fixed in size.

Pop-up Windows



- Use pop-up windows to display:
  — Additional information when an abbreviated form of the information is the main presentation.
  — Textual labels for graphical controls.
  — Context-sensitive Help information

3. Explain Cognitive Walkthroughs, think Aloud evaluation and usability tests conducted in UID.
Solution:

Cognitive Walkthroughs

- Description:
  — Reviews of the interface in the context of tasks users perform.
- Advantages:

— Allow a clear evaluation of the task flow early in the design process.
— Do not require a functioning prototype.
— Low cost.
— Can be used to evaluate alternate solutions.
— Can be performed by developers.
— More structured than a heuristic evaluation.
— Useful for assessing "exploratory learning."

- Disadvantages:
  — Tedious to perform.
  — May miss inconsistencies and general and recurring problems.
- Guidelines:
  — Needed to conduct the walkthrough are:
    • A general description of proposed system users and what relevant knowledge they possess.
    • A specific description of one or more core or representative tasks to be performed.
    • A list of the correct actions required to complete each of the tasks.
  — Review:
    • Several core or representative tasks across a range of functions.
    • Proposed tasks of particular concern.
  — Developers must be assigned roles of:
    • Scribe to record results of the action.
    • Facilitator to keep the evaluation moving.
  — Start with simple tasks.
  — Don't get bogged down demanding solutions.
  — Limit session to 60 to 90 minutes.

Think-Aloud Evaluations

- Description:
  — Users perform specific tasks while thinking out load.
  — Comments are recorded and analyzed.
- Advantages:
  — Utilizes actual representative tasks.
  — Provides insights into the user's reasoning.
- Disadvantages:
  — May be difficult to get users to think out loud.
- Guidelines:
  — Develop:
    • Several core or representative tasks.
    • Tasks of particular concern.
  — Limit session to 60 to 90 minutes.

Usability Test

- Description:
  — An interface evaluation under real-world or controlled conditions.

— Measures of performance are derived for specific tasks.
— Problems are identified.

- Advantages:
  — Utilizes an actual work environment.
  — Identifies serious or recurring problems.
- Disadvantages:
  — High cost for establishing facility.
  — Requires a test conductor with user interface expertise.
  — Emphasizes first-time system usage.
  — Poorly suited for detecting inconsistency problems.

4. Explain Radio buttons and list boxes selection controls in detail.
Solution :

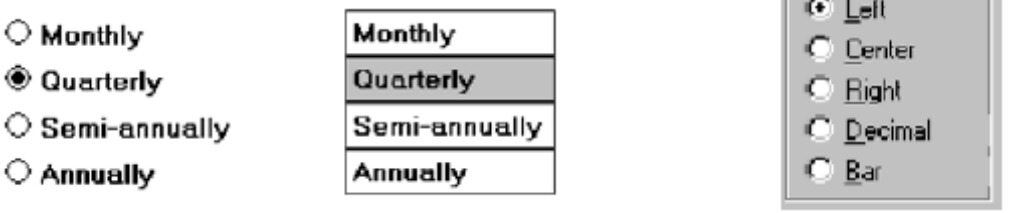
Radio Buttons

- Description:
  - A two-part control consisting of the following:
    - Small circles, diamonds, or rectangles.
    - Choice descriptions.
  - When a choice is selected:
    - The option is highlighted.
    - Any existing choice is automatically unhighlighted and deselected.
- Purpose:
  - To set one item from a small set of mutually exclusive options (2 to 8).
- Advantages:
  - Easy-to-access choices.
  - Easy-to-compare choices.
  - Preferred by users.
- Disadvantages:
  — Consume screen space.
  — Limited number of choices.
- Proper usage:
  — For setting attributes, properties, or values.
  — For mutually exclusive choices (that is, only one can be selected).
  — Where adequate screen space is available.
  — Most useful for data and choices that are:
    - Discrete.
    - Small and fixed in number.
    - Not easily remembered.
    - In need of a textual description to meaningfully describe the alternatives.

• Most easily understood when the alternatives can be seen together and compared to one another.
• Never changed in content.

— Do not use:

• For commands.
• Singly to indicate the presence or absence of a state.



Choice Descriptions

- Provide meaningful, fully spelled-out choice descriptions clearly describing the values or effects set by the radio buttons.
- Display in a single line of text.
- Display using mixed-case letters, using the sentence style.
- Position descriptions to the right of the button. Separate them by at least one space from the button.
- When a choice is conditionally unavailable for selection, display the choice description grayed out or dimmed.
- Include a none choice if it adds clarity.

Size

- Show a minimum of two choices, a maximum of eight.

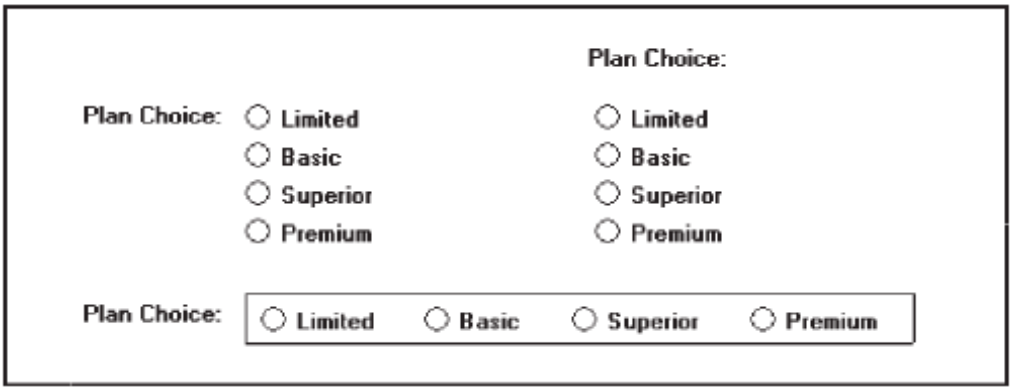
Defaults

- When the control possesses a state or affect that has been predetermined to have a higher probability of selection than the others, designate it as the default and display its button filled in.
- When the control includes choices whose states cannot be predetermined, display all the buttons without setting a dot, or in the *indeterminate* state.
- When a multiple selection includes choices whose states vary, display the buttons in another unique manner, or in the *mixed value* state.

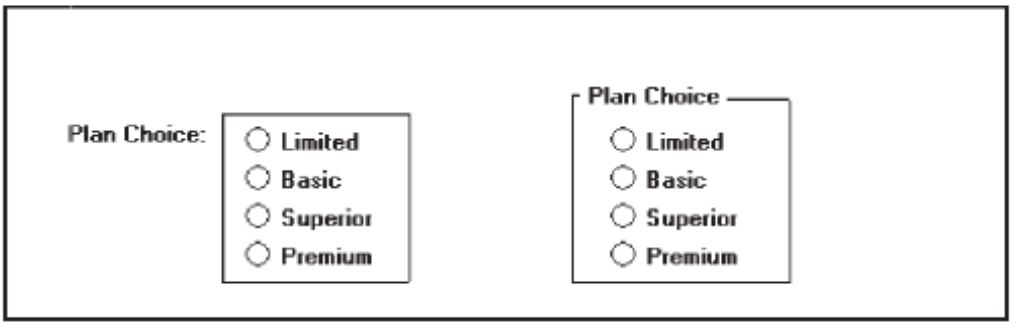
Structure

- A columnar orientation is the preferred manner of presentation.
- Left-align the buttons and choice descriptions.

- If vertical space on the screen is limited, orient the buttons horizontally.
- Provide adequate separation between choices so that the buttons are associated with the proper description.
  — A distance equal to three spaces is usually sufficient.
- Enclose the buttons in a border to visually strengthen the relationship they possess.



Still Better



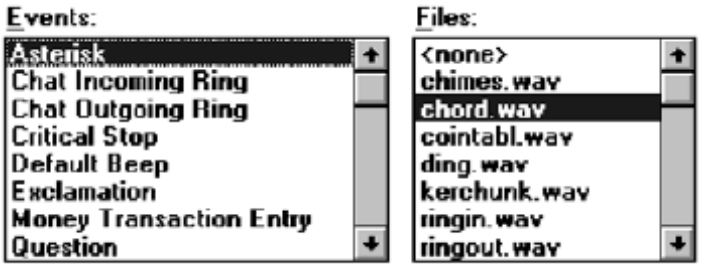
Best

Organization

- Arrange selections in expected order or follow other patterns such as frequency of occurrence, sequence of use, or importance.
  — For selections arrayed top to bottom, begin ordering at the top.
  — For selections arrayed left to right, begin ordering at the left.
- If, under certain conditions, a choice is not available, display it subdued or less brightly than the available choices.

List Boxes

- Description:
  - — A permanently displayed box-shaped control containing a list of attributes or objects from which:
    - A single selection is made (mutually exclusive), or
    - Multiple selections are made (non-mutually-exclusive).
  - — The choice may be text, pictorial representations, or graphics.
  - — Selections are made by using a mouse to point and click.
  - — Capable of being scrolled to view large lists of choices.
  - — No text entry field exists in which to type text.
  - — A list box may be may be associated with a *summary list box* control, which allows the selected choice to be displayed or an item added to the list.
- Purpose:
  - — To display a collection of items containing:
    - • Mutually exclusive options.
    - • Non-mutually-exclusive options.
- Advantages:
  - — Unlimited number of choices.
  - — Reminds users of available options.
  - — Box always visible.
- Disadvantages:
  - — Consumes screen space.
  - — Often requires an action (scrolling) to see all list choices.
  - — The list content may change, making it hard to find items.
  - — The list may be ordered in an unpredictable way, making it hard to find items.
- Proper usage:
  - — For selecting values or setting attributes.
  - — For choices that are:
    - • Mutually exclusive (only one can be selected).
    - • Non-mutually-exclusive (one or more may be selected).
  - — Where screen space is available.
  - — For data and choices that are:
    - • Best represented textually.
    - • Not frequently selected.
    - • Not well known, easily learned, or remembered.
    - • Ordered in an unpredictable fashion.
    - • Frequently changed.
    - • Large in number.
    - • Fixed or variable in list length.
  - — When screen space or layout considerations make radio buttons or check boxes impractical.



List Box General Guidelines

Selection Descriptions

- Clearly and meaningfully describe the choices available. Spell them out as fully as possible.
  — Graphical representations must clearly represent the options.
- Present in mixed case, using the sentence style structure.
- Left-align into columns.

List Size

- Not actual limit in size.
- Present all available alternatives.
- Require no more than 40 page-downs to search a list.
  — If more are required, provide a method for using search criteria or scoping the options.

5. What are operable controls? Explain usage of buttons along with their advantages and disadvantages.
Solution :

Operable controls are those that permit the entry, selection, changing, or editing of a particular value, or cause a command to be performed. Classes include buttons, text entry/read-only, selection, combination entry/selection, and other specialized controls.

Buttons

- Description:
  — A square or rectangular-shaped control with a label inside that indicates action to be accomplished.
  — The label may consist of text, graphics, or both.
- Purpose:
  — To start actions.
  — To change properties.
  — To display a pop-up menu.
- Advantages:
  — Always visible, reminding one of the choices available.

- Convenient.
- Can be logically organized in the work area.
- Can provide meaningful descriptions of the actions that will be performed.
- Larger size generally provides faster selection target.
- Can possess 3-D appearance:
  - Adds an aesthetically pleasing style to the screen.
  - Provides visual feedback through button movement when activated.
- May permit use of keyboard equivalents and accelerators.
- Faster than using a two-step menu bar/pull-down sequence.

- Disadvantages:
  - Consumes screen space.
  - Size limits the number that may be displayed.
  - Requires looking away from main working area to activate.
  - Requires moving the pointer to select.
- Proper usage:
  - Use for frequently used actions that are specific to a window.
    - To cause something to happen immediately.
    - To display another window.
    - To display a menu of options.
    - To set a mode or property value.
- A button comes in three styles.

Command buttons.

Toolbar buttons without labels.

Symbol button

Command Buttons

Command button guidelines include the following.

Usage

- For windows with a menu bar:
  - Use to provide fast access to frequently used or critical commands.
- For windows without a menu bar:
  - Use to provide access to all necessary commands.

Structure

- Provide a rectangular shape with the label inscribed within it.
- Give the button a raised appearance.
- Maintain consistency in style throughout an application.

Labels

- Use standard button labels when available.
- Provide meaningful descriptions of the actions that will be performed.
- Use single-word labels whenever possible.
  - — Use two-three words for clarity, if necessary.
- Use mixed-case letters with the first letter of each significant label word capitalized.
- Display labels:
  - — In the regular system font.
  - — In the same size font.
- Do not number labels.
- Center the label within the button borders, leaving at least two pixels between the text and the button border.
- Provide consistency in button labeling across all screens.

Size

- Provide as large a button as feasible.
- Maintain consistent button heights and widths.
- Exception: Buttons containing excessively long labels may be wider.

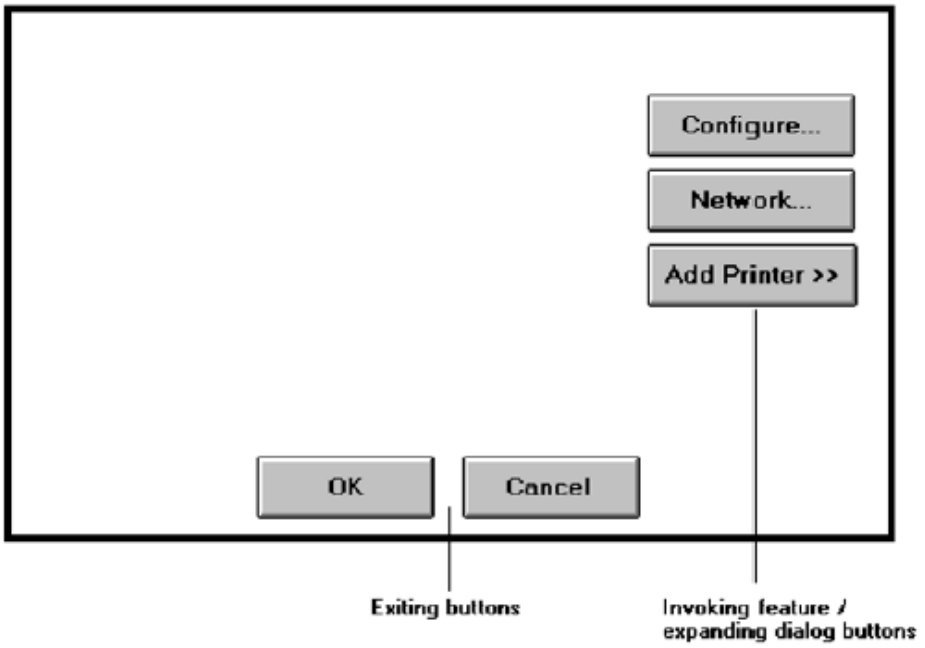
Number

- Restrict the number of buttons on a window to six or fewer.

Location and Layout

- Maintain consistency in button location between windows.

- Never simply “fit” buttons in available space.
- If buttons are for exiting the dialog:
  — Position them centered and aligned horizontally at the bottom.
- If buttons are used for invoking a dialog feature or expanding the dialog:
  — Position them centered and aligned vertically on the right side.
- If a button has a contingent relationship to another control:
  — Position it adjacent to the related control.
- If a button has a contingent relationship to a group of controls:
  — Position it at the bottom or to right of related controls.
- If, due to space constraints, exiting and expanding/invoking feature buttons must be placed together:
  — If at the bottom, place exiting buttons to the right, separating the groupings by one button’s width.
  — If along the right side, place exiting buttons at the bottom, separating the groupings by one button’s height.
- For exiting and expanding/invoking feature buttons, do not:
  — Align with the other screen controls.
  — Present displayed within a line border.
- Provide equal and adequate spacing between adjacent buttons.
- Provide adequate spacing between buttons and the screen body controls.



Organization

- Organize standard buttons in the manner recommended by the platform being used.
- For other buttons, organize them in common and customary grouping schemes.
  — For buttons ordered left to right, place those for most frequent actions to the left.

— For buttons ordered top to bottom, place those for most frequent actions at the top.

- Keep related buttons grouped together.
- Separate potentially destructive buttons from frequently chosen selections.
- Buttons found on more than one window should be consistently positioned.
- The order should never change.
- For mutually exclusive actions, use two buttons; do not dynamically change the text.
- Windows recommends the following:
  - An affirmative action to the left (or above).
  - The default first.
  - OK and Cancel next to each other.
  - Help last, if supported.

Intent Indicators

- When a button causes an action to be immediately performed, no intent indicator is necessary.

- When a button leads to a cascading dialog, include an ellipsis (...) after the label.

- When a button leads to a menu, include a triangle pointing in the direction the menu will appear after the label.

- When a button leads to an expanding dialog, include a double arrow (>>) with the label.

- When a button has a contingent relationship to another control that must be indicated, include a single arrow (->) pointing at the control.

Expansion Buttons

- Gray them out after expansion.
- Provide a contraction button, if necessary.
  - — Locate it beneath, or to right of, the expansion button.
  - — Gray it out when not applicable.

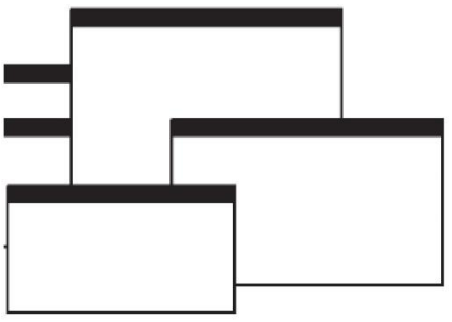
Defaults

- Intent:
  — When a window is first displayed, provide a default action, if practical.
- Selection:
  — A default should be the most likely action:
    • A confirmation.
    • An application of the activity being performed.
    • A positive action such as OK, unless the result is catastrophic.
  — If a destructive action is performed (such as a deletion), the default should be Cancel.
- Presentation:
  — Indicate the default action by displaying the button with a bold or double border.
- Procedures:
  — The default can be changed as the user interacts with the window.
  — When the user navigates to a button, it can temporarily become the default.
  — Use the Enter key to activate a default button.
  — If another control requires use of the Enter key, temporarily disable the default while the focus is on the other control.
  — Permit double-clicking on a single selection control in a window to also carry out the default command.

6. Describe Overlapping windows and tiled window presentation styles with examples
Solution:

Overlapping Windows

- Overlapping windows may be placed on top of one another like papers on a desk.
- They possess a three-dimensional quality, appearing to lie on different planes.



Advantages:

- Visually, their look is three-dimensional, resembling the desktop that is familiar to the user.
- Greater control allows the user to organize the windows to meet his or her needs.
- Windows can maintain larger sizes.
- Windows can maintain consistent sizes.

- Windows can maintain consistent positions.
- Screen space conservation is not a problem, because windows can be placed on top of one another.
- There is less pressure to close or delete windows no longer needed.
- The possibility exists for less visual crowding and complexity. Larger borders can be maintained around window information, and the window is more clearly set off against its background. Windows can also be expanded to fill the entire display.
- They yield better user performance for tasks where the data requires much window manipulation to complete the task.

Disadvantages

- They are operationally much more complex than tiled windows. More control functions require greater user attention and manipulation.
- Information in windows can be obscured behind other windows.
- Windows themselves can be lost behind other windows and be presumed not to exist.
- That overlapping windows represent a three-dimensional space is not always realized by the user.
- Control freedom increases the possibility for greater visual complexity and crowding. Too many windows, or improper offsetting, can be visually overwhelming.

Tiled Windows

- Tiled windows derive their name from common floor or wall tile. Tiled windows appear in one plane on the screen and expand or contract to fill up the display surface, as needed.
- Most systems provide two-dimensional tiled windows, adjustable in both height and width.

Advantages:

- The system usually allocates and positions windows for the user, eliminating the necessity to make positioning decisions.
- Open windows are always visible, eliminating the possibility of them being lost and forgotten.
- Every window is always completely visible, eliminating the possibility of information being hidden.
- They are perceived as fewer complexes than overlapping windows, possibly because there are fewer management operations or they seem less “magical.”

- They are easier, according to studies, for novice or inexperienced people to learn and use.
- They yield better user performance for tasks where the data requires little window manipulation to complete the task.

Disadvantages

- Only a limited number can be displayed in the screen area available.
- As windows are opened or closed, existing windows change in size. This can be annoying.
- As windows change in size or position, the movement can be disconcerting.

- As the number of displayed windows increases, each window can get very tiny.
- The changes in sizes and locations made by the system are difficult to predict.
- The configuration of windows provided by the system may not meet the user's needs.
- They are perceived as crowded and more visually complex because window borders are flush against one another, and they fill up the whole screen. Crowding is accentuated if borders contain scroll bars or control icons. Viewer attention may be drawn to the border, not the data.
- They permit less user control because the system actively manages the windows.