**- GRAPHIC USER INTERFACE (GUI) –**

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| **GUI:** An easy-to-use visual experience builder for Java applications. It is mainly made of graphical components like buttons, labels, windows, etc. through which the user can interact with an application. It is developed using the Java swing (previously AWT Abstract Window Toolkit was used).   * Opposite to it is the Character User Interface (CUI) which are experiences such as the cmd window. |

1. **COMPONENT ARRANGEMENTS**

* Implement the runnable interface by having your own implementation of the run method
* The **Runnable interface** is implemented by any class whose instances are intended to be executed by a thread. The class must define a method of no arguments called run.

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|  | **Example and Explanation** | |
| **BorderLayout**  **(default)** | Places components in up to five areas: top, bottom, left, right, and centre. All extra space is placed in the centre area. | A picture of a GUI that uses BorderLayout |
| **GridLayout** | Makes a bunch of components equal in size and displays them in the requested number of rows and columns. | A picture of a GUI that uses GridLayout |
| **FlowLayout** | Lays out components in a single row, starting a new row if its container is not sufficiently wide. | A picture of a GUI that uses FlowLayout |

1. **FRAME (CLASS THAT OTHER CLASSES EXTEND)**

* A Frame is a top-level window with a title and a border.
* The default layout for a frame is BorderLayout.
* The **size** of the frame includes any area designated for the border.
* The **dimensions** of the border sets the frame’s height and width:

**frame.setSize(new Dimension(300, 200));**

* A frame is printed on the screen if the **visibility** is set:

**frame.setVisible(true);**

* The **location** of the frame indicates where in the computer screen the frame will be printed:

**frame.setLocation(100, 50);**

* Other settings:

**setResizable(false);**

* 1. **Default Mechanism**

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| Class inheriting Frame | Constructor | Main Test |
| **public class Ex01\_MyFrame extends Frame {** | **public Ex01\_MyFrame(String title) { (title);}**  **// Sets frame name as the title set in the main class.** | **public static void main(String[] args) {**  **new Ex01\_MyFrame("First GUI");}**  **// Runs Ex01\_Myframe and sets frame name as “First GUI”** |

1. **COMPONENTS**

* Button, Label, Canvas, Checkbox, Choice, Scrollbar, List, Menu, TextComponent, TextArea, TextField, CheckboxGroup

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|  | **Component creation** | **Object declaration** | **Adding to Frame** |
| **Container** | **private Container contenPane;** | **contenPane = getContentPane();** | **contenPane.setLayout(new FlowLayout());** |
| **JPanel** | **private JPanel panel;** | **panel = new JPanel();** | **add(panel, BorderLayout.NORTH);** |
| **JButton** | **private JButton *buttonObjName*;**  **private ImageIcon icon;** | ***buttonObjName* = new JButton("*buttonName*",icon);**  **// “buttonObjName’ is how the program will recognize this button, and “buttonName” is what will be printed in the frame** | **add(*buttonObjName*, BorderLayout.CENTER);**  **// see above for BorderLayout** |
| **JLabel** | **private JLabel label*ObjName*;** | **label*ObjName =* new JLabel("labelName ");** | **Panel.add(label*ObjName);***  **// Adds to Panel (which is then added to the frame)** |
| **JTextField** | **private JTextField *txfObjName*;** | ***txfObjName =* new JTextField("*txfName* ", 20);**  **// Textfield will have the letter “ID” by default and has 20 columns (length of textfield)** | **Panel.add(*txfObjName);***  **// Adds to Panel** |
| **JList** | **private JList *listObjName*;** | ***listObjName* = new List();**  **// Creates an empty list** | **add(*listObjName*, BorderLayout.CENTER);** |
| **JComboBox** | **private Vector<String> items;**  **private String[] item = { "A", "B", "C" };**  **private JComboBox<String> *comboObjName*;** | **items = new Vector<String>();**  **items.add("A");**  **items.add("B");**  **items.add("C");**  ***comboObjName* = new JComboBox<String>(items);** | **contenPane.add(*comboObjName*);**  ***comboObjName*.setPreferredSize(new Dimension(100, 50));, 50));** |
| **JCheckBox** | **private JCheckBox *chkboxObjName*;** | ***chkboxObjName* = new JCheckBox("*chkboxName* ");** | **contenPane.add(*chkboxObjName*);**  ***chkboxObjName*.setPreferredSize(new Dimension(100** |
| **JScrollPane** | **private JScrollPane scrollBar;** | ***scrollBar = new JScrollPane(jtxtarea);*** | **contenPane.add(scrollBar, BorderLayout.SOUTH);** |