

**B. Sc. (H) Computer Science Semester II**  
**BHCS03 - Programming in JAVA**  
**Practical List**

- 1) Design a class Complex having a real part (x) and an imaginary part (y). Provide methods to perform the following on complex numbers:
  - a) Add two complex numbers.
  - b) Multiply two complex numbers.
  - c) toString() method to display complex numbers in the form:  $x + iy$
- 2) Create a class TwoDim which contains private members as x and y coordinates in package P1. Define the default constructor, a parameterized constructor and override toString() method to display the co-ordinates. Now reuse this class and in package P2 create another class ThreeDim, adding a new dimension as z as its private member. Define the constructors for the subclass and override toString() method in the subclass also. Write appropriate methods to show dynamic method dispatch. The main() function should be in a package P.
- 3) Define an abstract class Shape in package P1. Inherit two more classes: Rectangle in package P2 and Circle in package P3. Write a program to ask the user for the type of shape and then using the concept of dynamic method dispatch, display the area of the appropriate subclass. Also write appropriate methods to read the data. The main() function should not be in any package.
- 4) Create an exception subclass UnderAge, which prints "Under Age" along with the age value when an object of UnderAge class is printed in the catch statement. Write a class exceptionDemo in which the method test() throws UnderAge exception if the variable age passed to it as argument is less than 18. Write main() method also to show working of the program.
- 5) Write a program to implement stack. Use exception handling to manage underflow and overflow conditions.
- 6) Write a program that copies content of one file to another. Pass the names of the files through command-line arguments.
- 7) Write a program to read a file and display only those lines that have the first two characters as '/' (Use try with resources).

**Practical Programming Problems**  
**based on AWT:**

1. Write a program to create a frame using AWT. Implement mouseClicked( ), mouseEntered( ) and mouseExited( ) events. Frame should become visible when mouse enters it.
2. Using AWT, write a program to create a frame window without extending Frame class. Set dimension of frame window as 450, 350 and set its title as "My Own Frame".
3. Using AWT, write a program which responds to KEY\_TYPED event and displays in window the message "Typed character is: X". of for eg, 'X' is typed. Use adapter class for this and other two events.
4. Using AWT, write a program which responds to KEY\_TYPED event and displays in window the message "Typed character is: X". Use adapter class for this event.
5. Use Anonymous inner class concept in AWT, implement a program that responds to keyPressed and keyReleased events.
6. Using AWT, write a program to create a frame window without extending Frame class. Set dimension of frame window as 450, 350 and set its title as "My Own Frame". Display the text " Great concept" using label inside Frame Window.
7. Using AWT, write a program to display a string in frame window with pink color as background.
8. Using AWT, write a program to create two buttons named "Red" and "Blue". When a button is pressed the background color should be set to the color named by the button's label.
9. Using AWT, write a program to create two buttons labeled 'A' and 'B'. When button 'A' is pressed, it displays your personal information (Name, Course, Roll No, College) and when button 'B' is pressed, it displays your CGPA in previous semester.
10. Write a program to create a frame using AWT. Implement mouseDragged ( ) event. As the mouse is dragged, "\*" should be displayed along its path. Frame should become invisible when mouse exits it.
11. Write a program to create a frame using AWT. When the user clicks anywhere inside the window, a text should be displayed "Mouse clicked at the position (x,y)", where x,y are the coordinates where mouse is clicked. Frame should become invisible when mouse exits the window. Hint: Use MouseAdapter class concept.
12. Using Anonymous inner class concept in AWT, implement a program that responds to windowClosing() event. Hint: Use WindowAdapter concept.
  
13. Using AWT, develop a GUI app to create a frame window by extending Frame class. Set dimension of frame window as 400, 350 and set its title as "My Colorful Frame". Display the text "Frame members" inside Frame Window, with Red color as foreground color and yellow color as background color. Hint: Use methods of Frame Class.
14. Using AWT and Graphics, write a program to draw a line, circle, rectangle, arc and a filled oval in a frame window.
15. Create a GUI app to add 2 numbers. Numbers are accepted from user through TextField and result is displayed on a Label.
16. Create a GUI app to accept user id and password from user. On click of Submit button, Display a string message that "Your details have been submitted successfully". Make use of Labels and Textfields.
  - i. Demonstrate above program by using button action command string.
  - ii. Demonstrate above program by using button object reference.

# Practical Programming Problems

## List of Practical problems based on Swing

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You are required to write and execute following GUI applications of Java, based on the concepts we have covered on Swings:

1. Write a program to create a frame using Swing. Implement mouseClicked(), mouseEntered() and mouseExited() events such that:
  - a) Size of the frame should be tripled when mouse enters it.
  - b) Frame should reduce to its original size when mouse is clicked in it.
  - c) Close the frame when mouse exits it.
2. Using Swing, write a program which responds to KEY\_TYPED event and displays in window the message "Typed character is: X". if for eg, 'X' is typed. Use adapter class for this and other two events.
3. Using Swing, write a program to display a string in frame window with pink color as background.
4. Using Swing, write a program illustrates how to create and display a JLabel containing both an icon and a string.
5. Using Swing, write a program that creates a JTextField and adds it to the content pane. When the user presses enter, an action event is generated. This is handled by displaying the text in a label.
6. Using Swing, write a program to create two JButtons named "Red" and "Blue". When a button is pressed the background color should be set to the color named by the button's label.
7. Using Swing, write a program to create two JButtons labelled 'A' and 'B'. When button 'A' is pressed, it displays your personal information (Name, Course, Roll No, College) and when button 'B' is pressed, it displays your CGPA in previous semester.
8. Using Swing, write a program that uses a toggle button. Demonstrate how the item listener works. Use isSelected( ) to determine the button's state.

### **Textbooks & References:**

**[1] Java: The Complete Reference, Herbert Schildt, 10th Edition**