Advanced Programming 2025 – Year 2
Labwork 4: (5% - or 50 points out of 300 points for labwork this semester)

NOTE: ALL LABS TO BE COMPLETED IN PROJECTS USING ECLIPSE OR EQUIVALENT IDE (NO MORE TEXTPAD, EVER EVER EVER!!!)

TOPICS INCLUDE: Internationalization and Sound

IMPORTANT NOTES:

- **NO COPYING PERMITTED AND ZERO MARKS WILL APPLY TO COPIED WORK. FURTHER ACTION MAY BE TAKEN AGAINST STUDENTS THAT HAVE BEEN FOUND TO COPY WORK.**

- **ASSESSMENT WILL INVOLVE ONE-TO-ONE QUESTIONS ABOUT YOUR SUBMITTED WORK. A COMPLETED SELF-ASSESSMENT SHEET WILL BE USED TO GUIDE THE ASSESSMENT. USE COMMENTS IN YOUR CODE TO ENSURE YOU DON'T FORGET WHY YOU WROTE CODE YOU MAY LATER BE ASKED ABOUT.**

- **ALL WORK MUST BE SUBMITTED TO MOODLE BY DATES SPECIFIED (SUBMISSION DEADLINES WILL BE POSTED ON MOODLE).**

- **MANY OF THE TASKS ASSIGNED BELOW CAN BE COMPLEX AND\OR THE DESCRIPTIONS MAY REQUIRE FURTHER CLARIFICATIONS. PLEASE USE THE AVAILABLE LAB TIMES TO ASK FOR CLARIFICATIONS AND ADVICE\HINTS ON THE TASKS BELOW.**

- **YOU MUST USE AN IDE TO COMPLETE TASKS (e.g., Eclipse or IntelliJ or NetBeans or similar). Support and help provided for Eclipse primarily.**

- **CHATGPT and other similar AI tools that can code simple solutions are NOT PERMITTED. THEY DO NOT TEACH YOU HOW TO BECOME A GOOD PROGRAMMER EITHER!**

Part 1 – Play sounds using Clip (10 points)

Create an Eclipse Project called **Lab4Part1**. Create a class called **EverydayObjectSoundGUI** that will play a very short sound representing an everyday object selected with a button (in a JFrame). Include the text of the object with the button also, e.g., "Bike" should appear in the button as a picture of a bicycle. Have THREE everyday object buttons in the GUI and play a different **MATCHING sound** for each when the button is pushed (simple and very short **.wav** files tend to work best…it's a good idea to test the sound code with file(s) you know work first!…the objects used is your choice but the sound must match!).

Required activities and marking guideline:

- Create the GUI with the three buttons with everyday object images	(2 points)
- Create the Clips and link to the sound files	(3 points)
- Implement the simple GUI with handlers (make layout reasonable)	(2 points)
- Matching sound plays once object button pushed	(3 points)

Part 2 – Using Locales to display local sensitive information (10 points)

Create an Eclipse Project called **Lab4Part2**. Create an internationalized application called **OutputInternationalInformation** that will print out specific information in a regional format depending on the Locale passed to a method called **displayLocalizedInformation(Locale).** The application will create **THREE** Locale objects of your choice and pass each to the method in turn (e.g., Italian for Italy, English for the US, Spanish for Spain etc….see ISO codes for languages and countries). The method can simply print out to the default output device (System.out) **FIVE** locale-sensitive pieces of information IN EACH LOCALE including:

- The days of the week (in the locale language)
- The months of the year (in the locale language)
- A sample of the currency display of a big number (e.g. display 10000+ units of the currency with a decimal value, e.g., $10000.50 in the manner it is displayed in the Locale)
- Today's date in SHORT date format (e.g. 19/02/24 19th Feb in the UK/Ireland or 02/19/24 is 19th Feb in USA)
- One other additional locale-sensitive piece of information OF YOUR CHOICE!!! (MUST BE DIFFERENT TO OTHERS ALREADY DISPLAYED)

Required activities and marking guideline:

- Create the THREE Locale objects to pass to method	(2 points)
- Display days of week in EACH locale using method	(2 points)
- Display months of year in EACH locale using method	(2 points)
- Display a big number with decimals in EACH locale using method	(1 point)
- Display today's date in the SHORT format	(1 point)
- Display one more different locale-sensitive info OF YOUR CHOICE!	(2 points)

Part 3 GUI displaying and selecting available locales (15 points)

Create an Eclipse Project called **Lab4Part3**. Create a JFrame and set the title of the frame to "Display Localized Information Frame" when set to English – INTERNATIONALIZE THE TITLE…do not hard code the title!
Add a **JComboBox** to the frame that will fill with a full list of locales available on your machine (list them in the combo box in their full form, i.e., not just *en_GB* but *English (Great Britain)*). Make the JFrame work so that when you select a *Locale* from the combo box list of Locales a **JTextArea** will fill will the days of the week and months of the year in the selected Locale (some may not display correctly due to your operating system supports). Marks will be given for the use of methods.

Required activities and marking guideline:

• Create combo box and populate based on list of available locales	(3 marks)
• Set title of the frame using INTERNATIONALISATION technique	(2 marks)
• Get the full name of the locales for display in the current locale	(2 marks)
• Add listeners and handlers to the combo for selection	(1 mark)
• Create and add the text area to the display	(1 mark)
• Show weekdays in current locale using selected Locale	(2 marks)
• Show months in current locale using selected Locale	(2 marks)
• Use of methods	(2 marks)

Part 4 – Internationalized GUI with simple language switch (15 points)

Create an Eclipse Project called **Lab4Part4**. Modify **Lab4Part1** above (the everyday object sound GUI) so that it works in **three different languages**. Provide three buttons at the bottom of the interface for the three languages that also includes **a flag image** representing the language on the button (i.e., each language button will show the flag of the language\country indicated). The buttons MUST ALSO CHANGE LANGUAGE to receive full marks, i.e., if you switch to French ALL widgets change language including the selection button for the language. You may choose the languages you wish to translate to.

****N.B.**:** Hard-coding of the translation strings without using the resource getString() method will not receive any translation marks.

Required activities and marking guideline:

• Internationalize the three everyday object buttons used in part 1	(3 marks)
• Internationalization classes or property files used	(3 marks)
• Include the buttons for switching the language (three buttons)	(3 marks)
• Include the flag images with text in the international buttons	(1 mark)
• Internationalize the three language select buttons	(3 marks)
• Handlers and events to switch languages (all working)	(2 marks)