Lab2 – Due 4/4/2025

- Bell Choir - A multi-threaded program that plays songs (as described in class)
    - The program must be able to read a file containing a list of Bell Notes (validating/verifying the file), and these Note assignments will be handed out to individual Members for them to play.
    - Each Member can play at least one Note, but no more than two Notes, one for each hand.
    - Once a Note has been assigned to a Member, it can only be played by that Member.
    - A Conductor controls the tempo of the program (tells the Members when to play their notes)
    - Only one note can be playing at a time
    - The notes must be played in order with appropriate timing (note lengths).
    - The program must be able to read and play various songs, if given a correctly formatted song file.
    - Notes:
        - A note is part of a standard 13-note scale, where the note 'middle A' (440Hz) is identified by "A4", and an A an octave higher would be identified as "A5".
        - Sharp notes are indicated by appending S to the standard note, so middle A♯ would be indicated by 'A4S'.
        - Flat notes are equivalent to a sharp of the lower note, so to identify B ♭ , use 'A4S'.
        - A REST note (nothing is played) is identified by 'REST'.
    - Note Lengths
        - In music, common lengths are whole, half, quarter, and eighth notes. These are represented by the numbers 1, 2, 4, and 8 respectively in the song file.
        - The example program assumes each song is written in 4/4 time, and a whole note takes up an entire measure.
    - Bell Note:
        - A Bell Note (or song note) is represented by a Note, a space, and a Note Length.
        - For example, the whole note 'middle A' would be represented by:
            - A4 1
        - A half note REST would be represented by
            - REST 2
    - Song
        - A song is made up of a sequence of Bell Notes, where each Bell Note is on it's own line, played in succession one note at a time.
- Requirements
    - Project must be committed and pushed up to GitHub

    - Must use ANT to build/run
    - Each Member must play each assigned note in a separate thread
    - The assignment must be able to play the instructor provided song 'Mary Had a Little Lamb' with the sound output being properly recognizable with appropriate timing.
    - Student provided songs may be provided as additional song files to other students.
    - Improper song files **will** be provided during the final instructor demonstration to determine how well the program behaves when given invalid data.
- Grading criteria – See the ***Assignments and Labs*** document on Moodle
    - Extra Credit
        - Creating a custom song to play + 1-5 points
            - Must be easily identifiable and contain a minimum of 5 Notes and 15 Bell Notes
        - Adding support for Flat notes (♭) + 1-5 points
        - Allowing the players to play multiple Notes at the same time (harmony) + 1-15 points **(THIS IS VERY HARD!)**