ECE-3731 Final Project

Musical Calculator

(100 Points)

(5% Weightage in course)

INTRODUCTION

DTMF (Dual Tone Multi Frequency) is a technique in which 2 tones are sent from telephone to the exchange. Each digit is represented by 2 tones. See the following link for details.

https://en.wikipedia.org/wiki/Dual-tone_multi-frequency_signaling

Write an assembly language program that asks user to enter first digit between 0 and 9, in case of invalid input, the program asks user to enter a number again. The program generates 2 tones, each for half second. For example, if the user enters 5, it generates a tone of 770Hz for half second and 1336Hz for half second.

The program that asks user to enter second digit between 0 and 9, in case of invalid input, the program asks user to enter a number again. The program generates 2 tones, each for half second. For example, if the user enters 7, it generates a tone of 852Hz for half second and 1209Hz for half second.

The program that asks user to enter operation (+, -, *, /), in case of invalid input, the program asks user to enter a number again.

The program generates 2-digit output and displays it on terminal. The program then generates dual tone for Digit 1 and then the dual tone for Digit 2. For example, for the input digits (5 and 7), if the selected operation is *, the output is 35. The program generates a tone of 697Hz for half second and 1477Hz for half second (Dual tone for 3) and then generates a tone of 770Hz for half second and 1336Hz for half second (Dual tone for 5)

The program resets anytime if the user presses C.

Expected Components of your solution

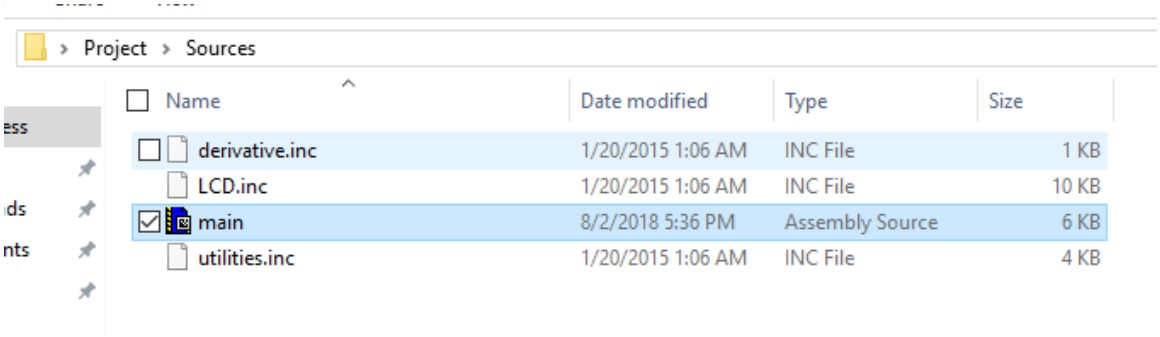
Treat this like I have hired you as a consultant. Your work must be professional and result in a final report that clearly shows that you have solved my problem. The report should be businesslike and reflect your high standards as a consultant.

Write the report to an audience that is knowledgeable about the design process. The report must have Title Page, Introduction and outline of the report, flowcharts. Various Sections (organized as you see appropriate) that include the following: Design process (how did you generated each frequency), Link of YouTube Video of your Demo, Summary, conclusions and future work.

None of the subroutines, including main cannot be more than 15 lines. Code must be commented, on top of each subroutine it must be mentioned what are the inputs and what are the outputs.

Submissions

- Report
- Main.asm



You will find main.asm in sources

- Link of YouTube Video of your Demo
- Do not include code in report

Bonus Points

- You will get 5 bonus points if you display the output on seven segment and demo it to the instructor on 10th August between 4 to 5pm.

Group Members

- I would encourage that each student does this project individually. However, you can do this project in a group of maximum 3 students.

Distribution of Points:

- Professional Report = 30 Points
- Main.asm file = 30 Points
- Youtube Video = 20 Points
- Code Properly Commented = 10 Points
- Flowcharts in report = 10 Points

Few Test Cases:

- 3 – 7 = -4
- 3 + 7 = 11
- 3 x 7 = 21
- 7 / 2 = 3

Note:

- *There will be 30% deduction for placing assembly code in report.*
- *Vericite is on for submission of report. Do not copy and paste from any source in report. There will be 50% deduction in project if the matching index of report exceeds 10%.*