Group project

- Course Weightage: 30% (Minor CA: 10%)
- Group Size: 4-6 members (typ.)
- Submission Dateline: Friday, 22 November 2019
- *You choose your own group members*

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Subject Coordinator

General Requirements

- Participation
- Programming, Debugging & Report preparation
- Group Submission
- Submit one program (executable + source code)
- Accompanying report
- **Report:**
- Hardcopy Report + Softcopy of files
  - Copy to Lab. Drive (Instructor PC)
    - One folder containing source & executables

Report Structure

- Full name of all members and a *group photograph* identifying individual members
- Description of the program and its use
  - Comment on any positive attributes of your program and its uniqueness
- Instructions for use
  - With screen shots of the computer display (as appropriate)
- Appendix:
  - Commented program listing with indentation
  - Flowchart

  - *Page limit of report 10 to 15 pages (not inclusive of appendices)*

Grading Scheme

Report: 40%

- *Content as indicated in previous slide*
- *Credit given to quality of presentation*

Program: 60%

- Functionality & comprehensiveness.
- Programming techniques and range of functions used
  - Scope of functions, modularity, structure etc.
- Novelty and comprehensive use of functions
  - "User Friendly", innovative features/interpretation
  - Error checking
- Robustness
  - Stable, does not crash or hang
- Ease of use
  - Precise instructions and contextual messages

Basic Requirements of Program

- Waveform Generator
  - Sine wave, square wave, triangular wave
  - Amplitude and frequency adjustment
  - Both accuracy of waveform and speed are desirable (Max. Hz)
- Use of command line arguments
  - Use this facility to initialise program setting and/or
  - Configure waveform and digital I/O
- Use digital switch and analogue potentiometer inputs
  - To terminate the program and/or
  - Configure program setting.
- Multi input/output options
  - Use Keyboard, switch and potentiometers for inputs.

- Write codes as modular subroutines.
  - Do this now, as you learn how to perform multi-threaded processes

Additional Functionality

- Read/write data to file on hard-disk or portable drive.
  - Configuration/waveform etc.
- Adjust mean value of waveform
  - In addition to amplitude
- Highest waveform frequency
  - What is the highest frequency, you can achieve?
- Frequency adjustability (resolution)
  - What is the range of frequency possible?
- Friendly and informative User Interface.
  - Provide useful instruction when an input is incorrect

Demonstrate Programming Skills & Techniques

- Multi thredad/processes
- Inter-process/thread communication & synchronisation
- Use threads & processes
  - As appropriate
- Use of alarms/signals etc
- Trapping of Ctrl+C
  - SIGINT signal
  - Orderly shutdown of program
    - Clear display and release resources.

Others

- Esthetically pleasant report and program output display
- Comprehensive and appropriate comments in program listing