EID Hackathon II

Embedded Interface Design

with **Bruce Montgomery**

Learning Objectives

Students will be able to…

- Apply some development skills
- Have some fun

Get Ready to Rumble!

In-class Point awards:

- Participation – 3 points
- Complete MQTT Task – 5 points
- Complete Mathplotlib Task – 8 points
- Complete QT UI Task – 10 points

- Remote students may request data for the Mathplotlib and QT UI tasks
- I will award 10 points for completing those tasks within an hour, 8 points for one complete task, 6 points for attempt. Timing is on your honor.

The team in class completing the highest number of tasks will be eligible to win a Raspberry Pi 3 A+ for each team member!

Ties will be result in two random winners among those finishing.

Rules

- **One PC per one or two-person team – no cell phones, tablets, or other connected devices**
- All tasks must be completed with Python or Node.JS code, your choice
- Use a VM or your native PC
- When you have completed a task, show me your result, then move on to the next task
- DO NOT start on a new task until the one you're on is finished and checked
- You can choose to skip a task; I will give you data you would get from that task, but you will not get credit for that task
- You may use any connected resource to help with your tasks

- The task directions are in Canvas under Class Files, EID CL24-L58 Hackathon 2
- Start now!

MQTT Task

- There is an MQTT publisher running at host mqtt.eclipse.org on port 1883 publishing 4-tuples of data to the topic “cueid1/datafeed” every second
- It publishes 36 unique 4-tuples of integers, then recycles
- You must collect and save the 36 4-tuples (you’ll need them later) – they are in the form [a,b,x,y]
- To complete this task, show me the data you collected
- You must do this task with Python or Node.JS code, not an MQTT utility

MatPlotLib Task

- The 4-tuples you have collected are in the following form:
  - [Line Number, Index Number, X, Y]
- Create a **simple** plot of the 4 Lines of data using Python and MatPlotLib. Plot the X,Y data of each line in order of the Index Number. Plot connecting lines between points.
- A good python example is here: https://matplotlib.org/3.1.1/api/_as_gen/matplotlib.pyplot.plot.html#matplotlib.pyplot.plot
- In this case, axis and graph titles are not needed.
- To advance to the next task – show me the graph; I'll know if you got it right (so will you)

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  - [Line Number, Index Number, X, Y]
- Create a **simple** plot of the 4 Lines of data using Python and MatPlotLib. Plot the X,Y data of each line in order of the Index Number. For each of the four lines, plot with connecting lines between points in Index Number order.
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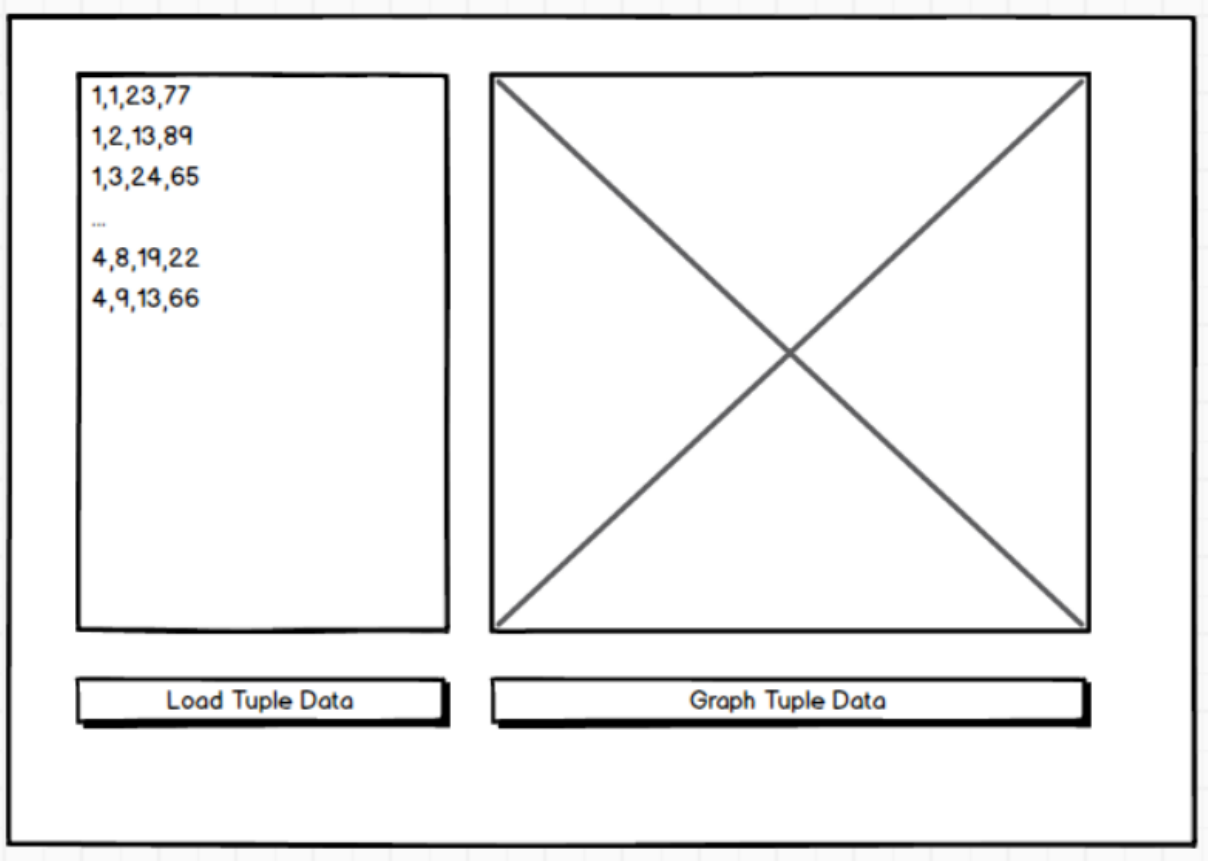
QT Task

- Create a QT UI per the following Wireframe
- The button Load Tuple Data should start with all original tuple data listed in order into the list box above the button
- The list should be editable
- The button Graph Tuple Data should use the data in the list box to re-run the MatPlotLib graph of the data as in the prior task and display the graph in the UI
- This should allow you to change the data easily to tweak the picture drawn by the data (no error checking is needed)
- Show me your app when it's done
- Take a deep breath and relax, you did it!



Next Steps

- Quiz Extra Credit - Article Review assignment is posted…
- Next week: Monday - Final review and wrap-up, Wednesday – Project demos
- Project 6 active (due 12/11) – no class on Wed 12/11 – go straight to the lab for demos
- New Quiz is up – last one next weekend (class feedback only)
- FCQs are up for this week
- Class staff available to help
  - Shubham - Tues 12-2 PM, Fri 3-5 PM in ECEE 1B24
  - Sharanjeet - Tues 2-3 PM, Thur 2-3 PM in ECEE 1B24
  - Bruce - Tue 9:30-10:30 AM, Thur 1-2 PM in ECOT 242
- Final Exam is set
  - Tuesday Dec 17 7:30 PM - 10 PM ECCR 1B51
  - Final will be open notes and Canvas based, you'll need a PC