1. Project number: S20-57

2. Project title (as will appear on the poster): Multi-Port Serial Communicator

3. Team members: Bohdan Kryzh, Yanbo Jiang, Jacob Gehrig, Adam Falkowski

4. Adviser(s) name(s): Athina Petropulu

5. Up to 5 keywords that will help to classify the project scope:
   - Serial Communication
   - Streamline
   - Python
   - Raspberry Pi
   - Arduino

6. Project abstract (up to 250 words) to be shared with judges:

   Chemical laboratories (pharmaceuticals, etc.) often use equipment that can be automated via serial communication by using commands in the form of strings of text. While these devices usually come with built-in interfaces on the device to control them or software to control each individual piece, it is advantageous to control all devices from one central location. In the control systems industry, this requires control software, programmable logic controllers, protocol converters, and extra hardware for power and other connections. The result is a large, slow, and expensive device that is not optimal for high speed data acquisition and control of the equipment. The multi-port serial communicator solves these issues by using a Raspberry Pi to host a user interface with every device’s commands. The Raspberry Pi in turn controls an Arduino MEGA, which handles the serial communications to four devices by sending the actual command strings via RS232 or RS485. Since the Arduino can operate much faster than many PLCs used in the control systems industry, response time between selecting a command and the device receiving the command is much faster. Additionally, data can be acquired at a much higher rate, providing constant access to accurate data.