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## JOONGHEUM PARK

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### Required Skills:

Students are expected to know the basics of ABG or LFT interpretation (clinical text will be provided.), development of UI/UX for clinicians, and SMART-on-FHIR.

### Preferred Team Communications:

TBD

### Data Sources:

Clinical text will be provided by the mentor.

### Other Items:

Project has timezone flexibility. Mentors and students will determine a good time for virtual meeting

The mentor is an app developer and had already developed an ABG analysis app for clinicians. You can find it in the App Store (titled 'SmartIntern ABG') The app already had some elements of knowledge support, although it does not work with FHIR.

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## FROM WHAT-TO-DO TO WHAT-TO-KNOW: KNOWLEDGE-BASED LAB INTERPRETATION FOR CLINICIANS AT THE POINT OF CARE

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The current CDS (Clinical Decision Support) system might provide unprocessed information, rather than real knowledge. For instance, we can easily imagine a CDS tool, which interprets ABG(Arterial Blood Gas) with well-defined algorithms (e.g., pH > 7.35 and serum [HCO<sub>3</sub>-] < 20mEq/L is consistent with metabolic acidosis). The majority of CDS provides alerts and recommendations without comprehensive knowledge. I want to suggest a tool which tells clinicians 'what-to-know' at the point of care, rather than just telling them what-to-do. The tool will achieve this by providing the reasoning behind the decisions for lab interpretation.

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### PROJECT OBJECTIVES

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Development and usability testing for ABG(Arterial Blood Gas) OR LFT(Liver function test) interpretation tool. ABG analysis will require more intensive clinical knowledge than LFT interpretation. The team will need to choose either ABG or LFT as the project target.

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### SUCCESSFUL PROJECT

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The app should be able to communicate with EHR through FHIR to obtain clinical lab variables. Individual variables (acuity of clinical course for ABG; the presence of alcoholism for LFT) might be received via manual input by clinicians. The lab will be interpreted with well-defined formulae and algorithms. Once the lab is analyzed, the app should be able to generate comprehensive text in natural language. For instance, ABG of pH 7.4, HCO 25, Na 140, Cl 90 is consistent with 'normal ABG with high anion gap' (initial interpretation). The generated text will suggest that 'the ABG parameters are normal, but anion gap is high with high [Na<sup>+</sup>] and low [Cl<sup>-</sup>]. Literature suggests that clinicians should suspect organic acidosis even without no other evidence of metabolic when anion gap is large.'

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**Intellectual Property:** The mentor will own fifty percent of IP developed as a result of this project, and the students will split the other fifty..