Physical Activity Analysis: 
A project in many languages

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Project Goals:
• Use commercially available physical activity monitors (FitBit One) to collect detailed data about physical activity in adult women in rural Poland
• Analyze effects of physical activity in relation to markers of bone turnover and levels of reproductive hormones
• Leverage continuous data for time-use analysis methods and daily summary data for overall activity level
• Avoid spending research funds on very expensive activity monitors and software

Challenges & Solutions:
• FitBit does not provide continuous data from web interface
  - Request developer API from company with special permissions
  - Download physical activity data from FitBit servers using Ruby
• Summarized data includes days the device was delivered to & returned by study participant
  - Remove incomplete days of data collection, then
  - Average data from each individual across days
  - Analyzed in R because it would be tedious & error-prone in Excel
• Continuous data must be categorized
  - Sleep time should not be included in further analyses.
  - Remove first & last day from analysis because of incomplete data
  - Classify time intensity of activity for each remaining time period
  - Used Python (Jupyter notebook) for flexibility with data structures

Outcomes:
• Code is written to allow for quick downloading of physical activity data and fast, consistent parsing of files, which will be useful for the additional data collection I will be performing in Summer 2016 and Summer 2017.
• Results from this analysis have been presented at 2016 Association of Physical Anthropologists annual meeting in Atlanta, GA (April 2016)
• Results from this analysis are accepted for presentation at 2016 International Society for Evolutionary Medicine and Public Health annual meeting in Durham, NC (June 2016)
• I will be applying to present work generated in this class at the Feminist Biology Symposium at the University of Wisconsin (October 2016)

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