Homework for GNSS Data Processing

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GNSS Data Processing Exercise

- Objective
  - Learn GNSS position accuracy based on data processing methods and parameter settings
    - Compare position accuracy between SPS, DGPS, RTK for static mode.
- Compute Position using SPS (Single), DGPS and RTK
  - Select GNSS Satellites
    - GPS only
    - GPS + QZSS + GAL + BDS
    - GPS + QZSS + GLO
  - Select Positioning Mode
    - Single for SPS
    - DGPS
    - Kinematic (RTK)
  - Set Mask Angle
    - Default is 15^0 ==> Change to higher or lower value (e.g. 0^0 or 30^0)
    - See how Mask Angle change affects position accuracy
  - Data Set
    - Use Static Data
    - Use different data sets if available
- Data Files
  - Static
    - BASE: NetR9_181215_static.binex
    - ROVER: F9P_181215_static.ubx
  - Dynamic
    - ECJ02_base.ubx
    - F9P_dynamic_rover.ubx
- Data Processing
  - Perform Position Computation (ALL: SPS, DGPS and RTK) with Static Data Files
  - Perform Position Computation only RTK with Dynamic Data Files
- Data Output
  - NMEA Format (for Static and Dynamic)
  - X/Y/Z-ECEF Format (for Static Only)
- Compare Position Accuracy
  - For Static Only
  - Use ECEF format to compute Standard Deviation, Mean etc.
- Plot Output Data
  - Use RTKPLOT (NMEA, ECEF)
  - Google Earth (only NMEA File)

Notes:
(1) Static observation data are taken at the same location. So, the errors are very small.
(2) Processing of Dynamic data is optional. But, it is better to check how position accuracy looks like in dynamic mode. Data are logged by driving a car.
(3) If time allows, please try RTKNAVI for real-time data process as well.
(4) Reference: Lecture materials: Installation_Setup_Instructions.pdf, 01_GNSS_CSIS_M02.pdf, 20_GNSS_DataProcessing_M02.pdf, 21_GNSS_DataProcessing_RTKNAVI_M01.pdf