IRIS Seismology Skill Building Workshop – June 13 to September 5, 2022

Performance Report for: Dilshad Raza

This free workshop was offered as a fully online, asynchronous opportunity for undergraduates to enhance their skills in scientific computing, while increasing their understanding of seismology concepts. The workshop consisted of a one–hour weekly webinar, interactive learning assignments, and a Slack workspace for discussion among workshop participants and staff. A total of 6 learning modules were assigned to students and each consisted of 5 to 7 assignments, plus an optional final project to showcase the skills learned in the workshop. On avearge, participants invest approximately 12 hours per module.

Module 1 – Introduction to Linux command line, shell scripting, and basic plot generation with Generic Mapping Tools (GMT) that enables exploration of earthquake patterns in space, time, and magnitude, and Earth's internal structure based on seismic wave travel times.

7 of 7 assignments completed (100% before the due date)
96.8% average score (90.4% workshop average)

Module 2 – Introduction to Seismic Analysis Code (SAC) for viewing seismograms as both waveforms and spectrograms, and conducting time series analysis, filtering, and component rotation that enables detection, characterization, and interpretation of seismic wave patterns.

6 of 6 assignments completed (66.7% before the due date)
90.8% average score (86.7% workshop average)

Module 3 – Use the myriad of IRIS waveform, metadata, and earthquake catalog request tools (e.g., web services, earthquake browser, Wilbur, MUSTANG, etc.) to check data availability and access data that enables exploration of relationships between earthquakes and plate boundaries and earthquake frequency and magnitude.

6 of 6 assignments completed (100% before the due date)
87.3% average score (86.8% workshop average)

Module 4 – Use various methods to visualize collections of seismic waveforms for a given earthquake and software for forward modeling and inversion that enables both estimation of subsurface velocity structures and earthquake hypocenter and fault plane solutions.

5 of 5 assignments completed (100% before the due date)
88% average score (89.5% workshop average)

Module 5 – Introduction to Python and commonly used libraries (e.g., NumPy, Matplotlib, Pandas, and ObsPy) for retrieving, processing, and plotting of data tables and times series that enables rapid scientific analysis of earthquake catalogs and seismic waveforms.

6 of 6 assignments completed (83.3% before the due date)
89.5% average score (87.8% workshop average)

Module 6 – Use existing and create new Jupyter Notebooks with Python to explain and share code with other scientists that enables advanced seismogram processing including removing an instrument response, calculating a spectrogram, and estimating temporal changes in cultural noise.

5 of 5 assignments completed (20% before the due date)
88.1% average score (84.4% workshop average)

For questions or additional information please visit https://www.iris.edu/hq/workshops/2022/01/ssb_3 or contact the instructors of record: Michael Hubenthal (IRIS Consortium, hubenth@iris.edu) and Mike Brudzinski (Miami University, brudzimr@MiamiOH.edu).