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Finish review

Started on	Wednesday, August 3, 2022, 8:36 AM
State	Finished
Completed on	Wednesday, August 3, 2022, 8:39 AM
Time taken	3 mins 29 secs
Marks	25.00/25.00
Grade	**100.00** out of 100.00

Question 1
Correct
1.00 points out of 1.00
Flag question

IRIS DMC Tutorial 2: IRIS GMAP Station Browser and MetaData Aggregator

In this assignment, you will get a chance to learn about the IRIS Google Maps (GMAP) Station Browser: http://ds.iris.edu/gmap

This web-based tool was designed to allow users to geographically browse through stations that may have seismic data stored at the IRIS Data Management Center (DMC). To start exploring seismic stations, find the Geographic Boundary section in the left-side menu of the GMAP interface. Select Location Box, and then the Draw Boundary button. Then click and drag on the map to create a purple box where you can examine the seismic stations available in this region. The click the Update Map button. If you want to adjust the region, just click the Draw Boundary button again. For this first question, we just want you to write about where you looked for seismic stations and what you found.

Answer: I searched for Pakistan and Afghanostan Location and its interesting that there are very less number of stations installed in this area.

Check

Correct
Marks for this submission: 1.00/1.00.

Question 2
Correct
1.00 points out of 1.00
Flag question

The GMAP interface does not have a formal help page or manual, but there were two release documents (link 1 and link 2) that provide some explanation of the GMAP interface and the MetaData Aggregator (MDA) that it provides access to. You can use these documents to help answer this question: What is the main purpose of creating GMAP and MDA?

Select one:
- a. to make data requests to the IRIS DMC
- b. to help a user get key information about a network, station, and channel in as few clicks as possible ✓
- c. to create a dashboard that summarizes how much data the IRIS DMC is receiving
- d. to show the spatial extent of data available at the IRIS DMC

Check

Correct
Marks for this submission: 1.00/1.00.

Question 3
Correct
1.00 points out of 1.00
Flag question

What is this *metadata* these sites are talking about?

Select one:
- a. data that is self-aware
- b. seismic data from multiple stations that has been combined together
- c. seismic data that has been processed into a more usable product
- d. recorded seismic data that has not been processed
- e. a set of information about recorded seismic data ✓

Check

Correct
Marks for this submission: 1.00/1.00.

Question 4
Correct
1.00 points out of 1.00
Flag question

To help explore how GMAP works, I have chosen a region of interest (Disclaimer: I am biased and chose an area I live and work in). You can access this region using this web link: http://ds.iris.edu/gmap/#network=*&maxlat=42&maxlon=-79.5&minlat=38&minlon=-85.5

Below the map will be a table of the stations shown on the map, with a total number of stations between the map and the table. How many stations are shown on this map?

Answer: 288

Check

Correct
Marks for this submission: 1.00/1.00.

Question 5
Correct
1.00 points out of 1.00
Flag question

That is a lot of stations! It sure looks like Ohio is killing it when it comes to seismic monitoring of a relatively low seismic hazard area. However, this map shows all stations that have ever existed in Ohio that reported data to the IRIS DMC. To see only those that are operating as part of a permanent seismic network, scroll down to Advanced Filters and click Permanent Networks, and then click Update Map. How many stations are shown on this map?

Answer: 251

Check

Correct
Marks for this submission: 1.00/1.00.

Question 6
Correct
1.00 points out of 1.00
Flag question

That is still a lot of permanent stations - Nice! We should investigate some of these stations and networks. Take a minute to scroll through the table below the map. I suspect that many of these 2-letter network abbreviations will not make any sense to you, but I wanted to point out one of the networks in the list: EM. EM stands for Electro-Magnetic Studies of the Continents, which is a large network of electromagnetic sensors that report their data to the IRIS DMC, even though the data is not seismic data. Click on one of the first EM stations in the table: INL47. This should pop up a bubble on the map to highlight where the station is and some key information about the station. Where is this station located?

Select one:
- a. Pigeon Creek, IN ✓
- b. Whitewater Park, IN
- c. Bull Creek, IN
- d. Versailles Park, IN
- e. Thurston Ditch, IN

Check

Correct
Marks for this submission: 1.00/1.00.

Question 7
Correct
1.00 points out of 1.00
Flag question

This station is part of a permanent network, but how many days did this station operate?

Answer: 8

Check

Correct
Marks for this submission: 1.00/1.00.

Question 8
Correct
1.00 points out of 1.00
Flag question

Next click on the More Information link in the pop-up window. This brings up the MetaData Aggregator for the IRIS DMC. It lists some of the same information at the pop-up window at the top, but then it provides more detailed information about the instruments recording at the station. This station has a NIMS, which stands for Narod Intelligent Magnetotelluric Systems. The NIMS is a 1 Hz sample rate long-period magnetotelluric (MT) instrument. If you do quick web search, what does a MT instrument measure or detect?

Select one or more:
- a. shaking from earthquakes
- b. geoelectric field variation at the surface ✓ 1 of 3 correct answers
- c. geomagnetic field variation at the surface ✓ 1 of 3 correct answers
- d. resistivity variations in the subsurface ✓ 1 of 3 correct answers

Check

Correct
Marks for this submission: 1.00/1.00.

Question 9
Correct
1.00 points out of 1.00
Flag question

Using the information in the MetaData Aggregator for station INL47, what is one of the 3-character channels of recorded data at this site?

Answer: LFN

Check

Correct
Marks for this submission: 1.00/1.00.

Question 10
Correct
1.00 points out of 1.00
Flag question

Since we started this assignment thinking about the ability to seismically monitor this area of the county, and this network is not recording seismic data, we should probably change our search parameters to remove this type of station channel. The channel information at INL47 gives us an indication of the type of channel we want to avoid. Which of the following channel descriptions would give us all seismic data recording of weak motion (high gain) on the vertical channel?

Select one:
- a. **Z
- b. BHV
- c. *HZ ✓
- d. *FZ
- e. BHZ
- f. LFZ
- g. **V
- h. *HV

Check

Correct
Marks for this submission: 1.00/1.00.

Question 11
Correct
1.00 points out of 1.00
Flag question

Please put your answer from the previous question in the Channel box of the Standard Filters and click Update Map. How many stations are shown on this map?

Answer: 186

Check

Correct
Marks for this submission: 1.00/1.00.

Question 12
Correct
1.00 points out of 1.00
Flag question

Not bad, that is still a lot of stations for this area of the country, but we should still take a closer look at the stations showing up on this map. If you look again at the table of stations, we can look at another network of interest. The first one on the list should be the AM network. Go ahead and click on one of the AM stations to popup information about it in the map. What is the site name (title) of the AM network? (To help ensure you get this correct, go ahead and copy and paste the 5 word title of the network)

Answer: Raspberry Shake Citizen Science Station

Check

Correct
Marks for this submission: 1.00/1.00.

Question 13
Correct
1.00 points out of 1.00
Flag question

Returning to the list of stations in the AM network in the table below the map, scroll down until you find the station named RD41A. This is our RaspberryShake station in the seismology research laboratory of the basement of the Department of Geology at Miami University You will notice that the Data Center listed for this station is RASPISHAKE. This means that the data is not stored at the IRIS DMC for this station. However, you can view realtime data from Raspberry Shake stations at the Raspberry Shake website. Their website https://stationview.raspberryshake.org/#/ shows a view of all the currently recording Raspberry Shake stations around the world. Take a minute to zoom in and see which station is closest to where you live. Tell us about where the station is and how close it is to where you live.

Answer: I live in Okara the closest station to me is in Islamabad, Pakistan.

Check

Correct
Marks for this submission: 1.00/1.00.

Question 14
Correct
1.00 points out of 1.00
Flag question

If we return to the information about the RD41A station on the IRIS GMAP, you can click on the **More information** link to see what channels this instrument records. What is Using the information that comes up in the MetaData Aggregator for this station, what is one of the 3-character channels of recorded data at this site?

Answer: SHZ

Check

Correct
Marks for this submission: 1.00/1.00.

Question 15
Correct
1.00 points out of 1.00
Flag question

Considering that our station is located in the seismology research laboratory of the basement of the Department of Geology at Miami University, the data is rather noisy and the station goes down fairly frequently. This is not uncommon for Raspberry Shake stations that are run by citizen scientists as well, so the AM network is not ideal for critical earthquake monitoring in our state. We should try to examine which stations are available that would not include these types of stations and focus more on broadband seismometers that routinely used for in depth seismological purposes. To do that, I would suggest you enter this code into the Channel Box and click Update Map: BHZ,HHZ

How many stations does this search return?

Answer: 116

Check

Correct
Marks for this submission: 1.00/1.00.

Question 16
Correct
1.00 points out of 1.00
Flag question

That is still a lot of stations, but we have not really explored whether some of these *permanent* networks are no longer recording. For example, scroll down in the table of stations to the first station in the TA network (L47A) and click on it to show information about it in the popup window. What is the full 3 word title of this network?

Answer: USArray Transportable Array

Check

Correct
Marks for this submission: 1.00/1.00.

Question 17
Correct
1.00 points out of 1.00
Flag question

Take a minute to web search about this network. Which of the following describes what was unique about this network?

Select one:
- a. it mapped the structure of the Earth's interior beneath North America
- b. all stations communicated their data in realtime and the data return was greater than 90%
- c. it migrated across the entire contiguous United States ✓
- d. it consisted of about 400 seismometers
- e. all stations were configured on a 70 km grid

Check

Correct
Marks for this submission: 1.00/1.00.

Question 18
Correct
1.00 points out of 1.00
Flag question

Returning to the information about station L47A, when did this station last operate? Please specify the date in the same format as they report in GMAP: YYYY-MM-DD

Answer: 2014-06-15

Check

Correct
Marks for this submission: 1.00/1.00.

Question 19
Correct

Considering it has been several years since this station operated, it would not be helpful for current monitoring of seismicity in this area. To deal with this, you can put the current date in the **Start Time** box in the Standard Filters and then click Update Map.
How many stations does this search return?

1.00 points out of 1.00

Flag question

Answer: 58

Check

Correct
Marks for this submission: 1.00/1.00.

Question 20

Correct

1.00 points out of 1.00

Flag question

This map is about right for what stations are currently used in this region for seismic monitoring. There is one more network that is not going to help very much: PN. Scroll down and click on the PPDWP station. The popup bubble indicates this station began recording in January 1999 with no end date for a long time (2599-12-31). If true, that would be a remarkable accomplishment considering this station is part of the PEPP network, which was an effort to install simple seismometers in schools. This is a case where the metadata sometimes fails to account for the true duration of recording at a site. To examine how much data from this station actually exists in the IRIS DMC, we will need to look at another IRIS tool, the MUSTANG databrowser: https://ds.iris.edu/mustang/databrowser/

This tool is more complex than the GMAP tool, because it is part of IRIS's Data Quality Assurance tools. You can learn about these efforts here: http://ds.iris.edu/ds/nodes/dmc/quality-assurance/ So what is MUSTANG designed for?

Select one:

- a. to send data quality information to end users
- b. to perform statistical calculations on seismic data
- c. to automatically filter out bad data
- d. to report seismic data quality metrics ✓

Check

Correct
Marks for this submission: 1.00/1.00.

Question 21

Correct

1.00 points out of 1.00

Flag question

Although we can use the MUSTANG databrowser to learn many things about the data at the IRIS DMC, we will use it today to see how much data is available in the IRIS DMC for our station PPDWP. You can choose the percent_availability option in the Metric drop-down menu for this purpose. Next choose a Time Span from 1999-01-01 to the present. Then choose the network (PN) and station PPDWP. It will automatically choose the right Location and Channel for this station. Then click on the Plot Data button near the top of the page. When did this station actually record?

Select one:

- a. 1999-2004
- b. 2001-2002 ✓
- c. 2004-2008
- d. 1999-2019
- e. 1999-2000

Check

Correct
Marks for this submission: 1.00/1.00.

Question 22

Correct

1.00 points out of 1.00

Flag question

There is one more network I would like you to look at. Scroll down in the table of stations to the stations in the MU network. These are stations that we deployed to form the Miami University Seismic Network and help with monitoring in Ohio - You're Welcome! Click on each of the stations to see where these sites are located on the map. Where are most of the stations?

Select one:

- a. Western Ohio
- b. Northern West Virginia
- c. Eastern Indiana
- d. Western Pennsylvania
- e. Southern Ohio
- f. Eastern Ohio ✓
- g. Northern Ohio

Check

Correct
Marks for this submission: 1.00/1.00.

Question 23

Correct

1.00 points out of 1.00

Flag question

So why did we deploy most of our stations in this location and run them in realtime? To help answer this question, you can review one of our papers to see how the stations have been used: https://www.pnas.org/content/115/8/E1720.short .

Select one:

- a. shallow crustal structure
- b. deep mantle structure
- c. cultural noise patterns
- d. human induced seismicity ✓
- e. tectonic seismicity

Check

Correct
Marks for this submission: 1.00/1.00.

Question 24

Correct

1.00 points out of 1.00

Flag question

For the next part of this assignment, you should change the filters to Remove Start Time, keep the *HZ Channel description, Switch to Temporary Network, and then click Update Map. Based on the use of color on the symbols to indicate stations of a common network, you should see two networks that crisscross through this region. Click on a station from the network that extends from the northeast to the southwest, and click on **More information**. Notice that the name of this temporary network is not visible on the summary popup bubble or on the MDA page that comes up. However, you can click on a small DOI button next to the XA network name on the MDA page. This brings up a summary page from the International Federation of Digital Seismograph Networks (FDSN), which includes a short description of the network. What was the main research target of this network?

Select one:

- a. shallow crustal structure
- b. deep mantle structure ✓
- c. tectonic seismicity
- d. human induced seismicity
- e. cultural noise patterns

Check

Correct
Marks for this submission: 1.00/1.00.

Question 25

Correct

1.00 points out of 1.00

Flag question

Now return to the GMAP interface and click on a station from the network that extends from the northwest to the southeast, then click on **More information**, and then the DOI button. What was the main research target of this network?

Select one:

- a. cultural noise patterns
- b. deep mantle structure
- c. lithospheric structure ✓
- d. tectonic seismicity
- e. human induced seismicity

Check

Correct
Marks for this submission: 1.00/1.00.

Finish review