INZAGEMOMENT

Cijfer: 9,1 | Cursus: M-CS Data Science 202300200 | Toetsnaam: 2025-03-12- M-CS - Data Science - 202300200 - Topic GIS | Status: Afgesloten

Soort: Toets | Tijd over: 298 min. en 59 sec.

Geen filters geselecteerd; alle antwoorden worden getoond

Vraag 1

Beantwoord op: 12 maart 2025 - 08:59 **Duration:** 2 min. en 18 sec. **Score:** 10 van 10 pt.

10 pt.

In a Python Jupyter notebook, a multispectral image is read and stored in the numpy array **img**. When the code **print(img.shape)** is executed, the output is **[100, 80, 10]**. After performing a k-means clustering on this image, we obtain an **n-by-1** vector containing cluster indices of each observation. What is the value of **n**?

- ◯ 1000
- ◯ 80000
- ➜ ◉ 8000 — 10 pt. ✔
- ◯ 800

10 pt.

Vraag 2

Beantwoord op: 12 maart 2025 - 08:52 **Duration:** 41 sec. **Score:** 5 van 5 pt.

5 pt.

For the code **dataset = rasterio.open(data_path)**, followed by **dataset.count**, what does **dataset.count** represent?

Toon één vraag per pagina

◯Number of polygons in the dataset

◯Number of points in the dataset

➜ ◎Number of layers 5 pt. ✔

◯Number of cells in the layers

5 pt.

Vraag 3

Beantwoord op: 12 maart 2025 - 08:53 **Duration:** 2 min. en 2 sec. **Score:** 20 van 20 pt.

20 pt.

We would like to classify a hyperspectral image consisting of 150x150 (22500) pixels and 220 spectral bands. We have obtained labels of three classes for 1000 pixels of this image. From this labeled dataset we consider 70% for training the classifier and the remaining for testing it. Moreover, we apply a dimensionality reduction method before the classification.

Question a: What could be the size of the training dataset?

➜ ◎700 observations (pixels) and 10 features 10 pt. ✔

◯1000 observations (pixels) and 10 features

◯700 observations (pixels) and 220 features

◯1000 observations (pixels) and 220 features

10 pt.

Now imagine in the testing phase, you have obtained 240 correctly classified pixels.

Question b: What is the overall classification accuracy in this case?

➜ ◎80% 10 pt. ✔

◯90%

10 pt.

Toon één vraag per pagina

◯95%

Vraag 4

Beantwoord op: 12 maart 2025 - 08:58 **Duration:** 1 min. en 13 sec. **Score:** 10 van 10 pt.

10 pt.

We have a satellite multispectral image with 30 meters of spatial resolution covering an area of 1000000 square meters (1 square kilometer). Which of the following statements about this image is correct?

➜ ◎This image has more than 1000 pixels and around 10 bands. 10 pt. ✔

◯This image has less than 1000 pixels and around 10 bands.

◯This image has more than 1000 pixels and more than 100 bands.

◯This image has less than 1000 pixels and more than 100 bands.

10 pt.

Vraag 5

Beantwoord op: 12 maart 2025 - 08:57 **Duration:** 2 min. en 44 sec. **Score:** 16 van 20 pt.

16 pt.

Are the following statements **True** or **False**?

We can use a **GIS model** to measure or calculate a distance.

➜ ◎True 2 pt. ✔

◯False

2 pt.

Toon één vraag per pagina

radiation.

➜ ◉ True ✗

◯ False 2 pt. ✓

0 pt.

One way to obtain **spatial data** is by scanning existing printed maps.

➜ ◉ True 2 pt. ✓

◯ False

2 pt.

Data capture and preparation can be considered as capabilities of a **GIS system**.

➜ ◉ True 2 pt. ✓

◯ False

2 pt.

GIS makes use of spatial and non-spatial data to answer questions and solve problems that are of spatial relevance.

➜ ◉ True 2 pt. ✓

◯ False

2 pt.

Maps may <u>not</u> be suitable for showing all visible objects on Earth.

➜ ◉ True 2 pt. ✓

◯ False

2 pt.

The average filter can be used to **post-process a classification map** (image with classes) resulting from a multi-spectral image to

◯True

➜ ◎False 2 pt. ✔

Remote sensing often involves collecting Vector Data.

0 pt.

➜ ◎True ✖

◯False 2 pt. ✔

In remote sensing **object-based classification**, we do <u>not</u> consider the spectral information of pixels.

2 pt.

◯True

➜ ◎False 2 pt. ✔

Prime Meridian is the reference line for measuring latitude.

2 pt.

◯True

➜ ◎False 2 pt. ✔

Vraag 6

Beantwoord op: 12 maart 2025 - 08:48 **Duration:** 19 sec. **Score:** 5 van 5 pt.

5 pt.

Given the code **gdf = geopandas.read_file(data_path)**, which of the following statements can be used to determine if the dataset contains points, lines, or polygons?

◯gdf.type

◯gdf.geom_shape

◯gdf.shape

Vraag 7

Beantwoord op: 12 maart 2025 - 08:49 **Duration:** 25 sec. **Score:** 5 van 5 pt.

5 pt.

Given the following predefined geometry, which function can be used to select a region of interest (ROI) in Google Earth Engine Python API after importing ee?

cords = [[-122.09, 37.42],[-122.08, 37.43]]

◯ee.Geometry.Polygon(cords)

➜ ◎ee.Geometry.Rectangle(cords) 5 pt. ✔

◯ee.Geometry.LineString(cords)

◯ee.Geometry.Point(cords)

5 pt.

Vraag 8

Beantwoord op: 12 maart 2025 - 08:56 **Duration:** 1 min. en 26 sec. **Score:** 0 van 5 pt.

0 pt.

In a Python Jupyter notebook, using the Google Earth Engine (GEE) Python API, we collect satellite images of a specific region in a collection named **myCollection**. If we call **myCollection.median()**, what action will happen?

Toon één vraag per pagina

◯ The median pixel value is computed for the stack of images within a week from the **myCollection** dataset.

◯ The median pixel value is computed for each band by taking the median of all values at each pixel across the stack of all matching bands. 5 pt. ✔

➜ ◎ The median pixel value is computed for each image in “myCollection” by taking the median of all values across all the bands. ✖

Vraag 9

Beantwoord op: 12 maart 2025 - 08:49 **Duration:** 27 sec. **Score:** 5 van 5 pt. **5 pt.**

Which of the following in GIS allows for the accurate depiction of a river's path?

◯ A single x,y coordinate pair

➜ ◎ A set of connected x,y coordinates 5 pt. ✔

◯ A set of cells in a rectangular array containing different values

◯ A single cell in a rectangular array containing a single value

5 pt.

Vraag 10

Beantwoord op: 12 maart 2025 - 08:55 **Duration:** 44 sec. **Score:** 5 van 5 pt. **5 pt.**

Which of the following geospatial data sources typically provide vector data?

◯ A go-located camera or webcam

◯ A drone with an RGB camera

5 pt.

Toon één vraag per pagina

➜ ⦾A geo-located temperature sensor 5 pt. ✔

Vraag 11

Beantwoord op: 12 maart 2025 - 08:50 **Duration:** 26 sec. **Score:** 5 van 5 pt. **5 pt.**

We have a dataset that contains the daily average ground-level fine particle pollution (i.e., PM2.5) measurements for 10 years. Here are its first three rows:

	station_id	latitude	longtitude	date	PM2.5
1	001001	40.09068	116.173553	1/1/2014	11.3
2	001001	40.09068	116.173553	1/2/2014	12.1
3	001001	40.09068	116.173553	1/3/2014	12.8

Given this dataset and some spatial datasets that provide environmental, meteorological, and land-use information, can we use a machine learning model to predict daily PM2.5?

➜ ⦾Yes, for example, the Random Forest regression algorithm could be used. 5 pt. ✔

◯No, because it is not possible to generate a training dataset for this problem.

◯Yes, for example, the k-means clustering algorithm can be used.

◯Yes, for example, the Random Forest classification algorithm could be used.

5 pt.

Vraag 12

Beantwoord op: 12 maart 2025 - 08:51 **Duration:** 14 sec. **Score:** 5 van 5 pt. **5 pt.**

Which format is the most common way to store vector data files?

◯GRID

◯CRF

◯GeoTIFF

➜ ◎Shapefile 5 pt. ✔

5 pt.

Toon één vraag per pagina