Twitter Trends

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University of California, Berkeley

A Hook Into Data Science

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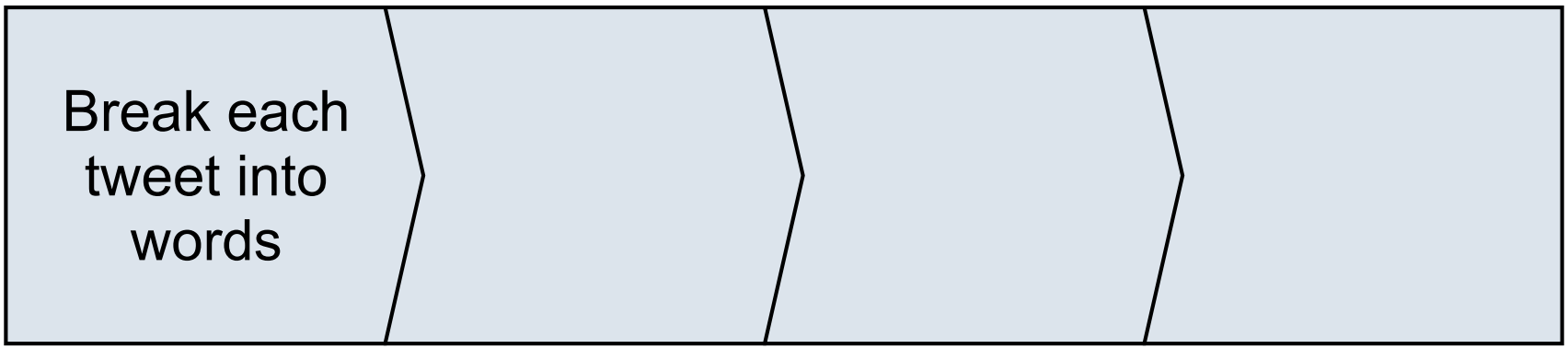

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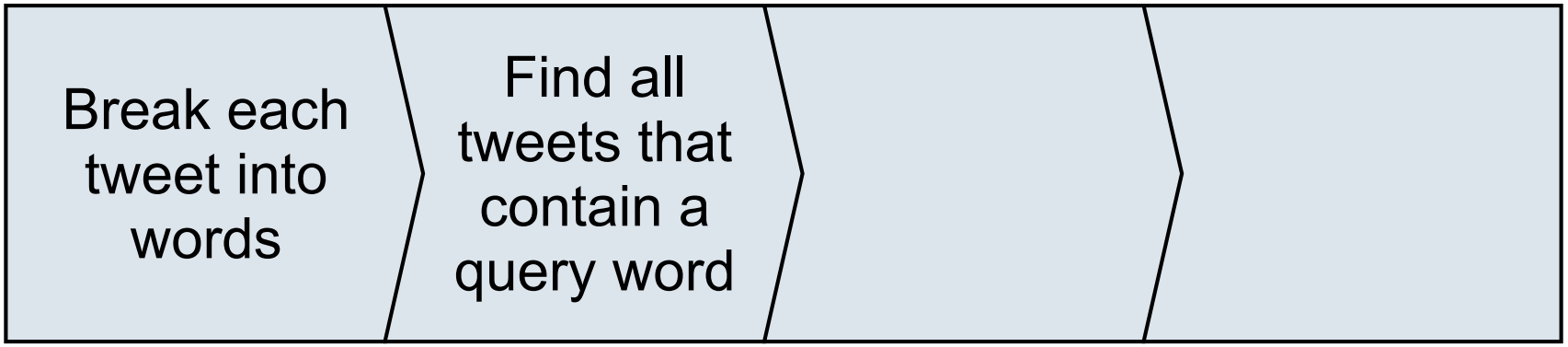

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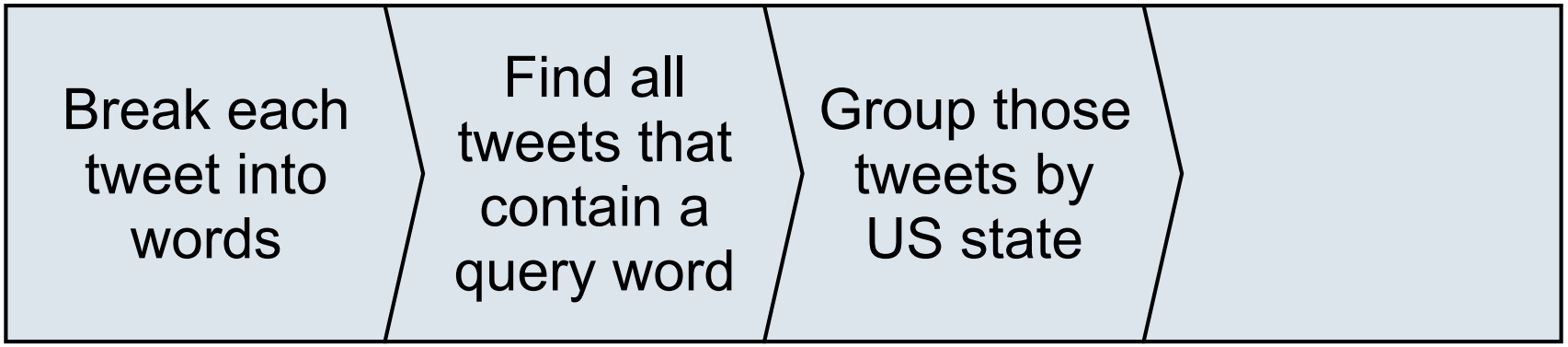

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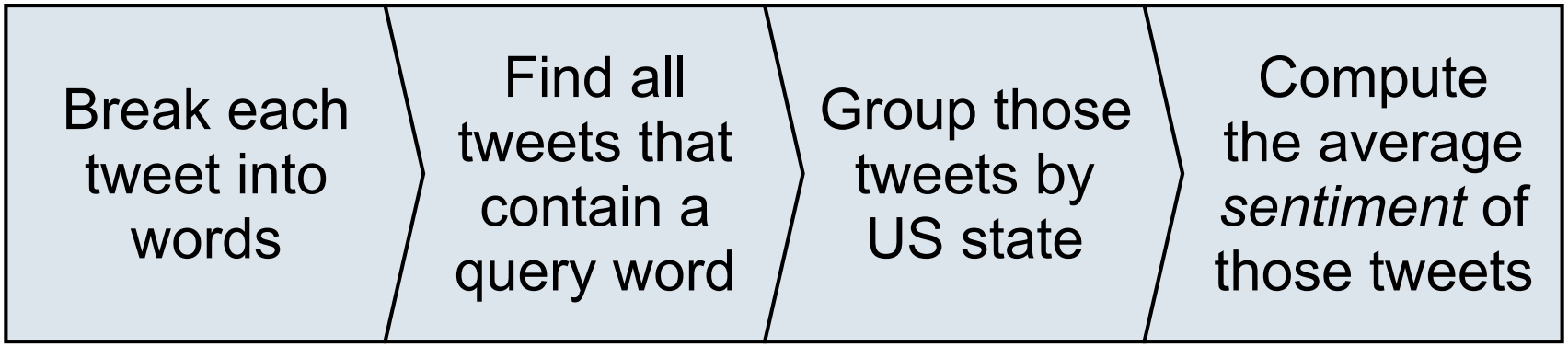

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I **love** the Texas summer but a high of 111 is **crazy**

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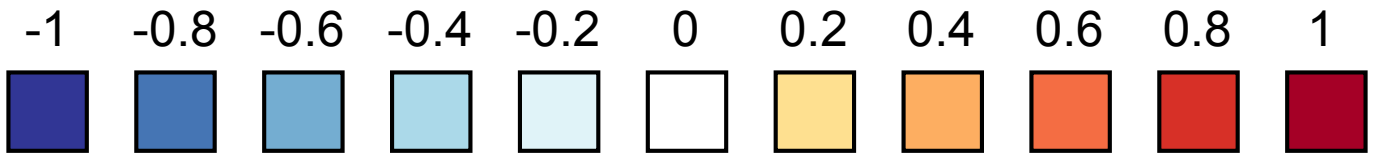

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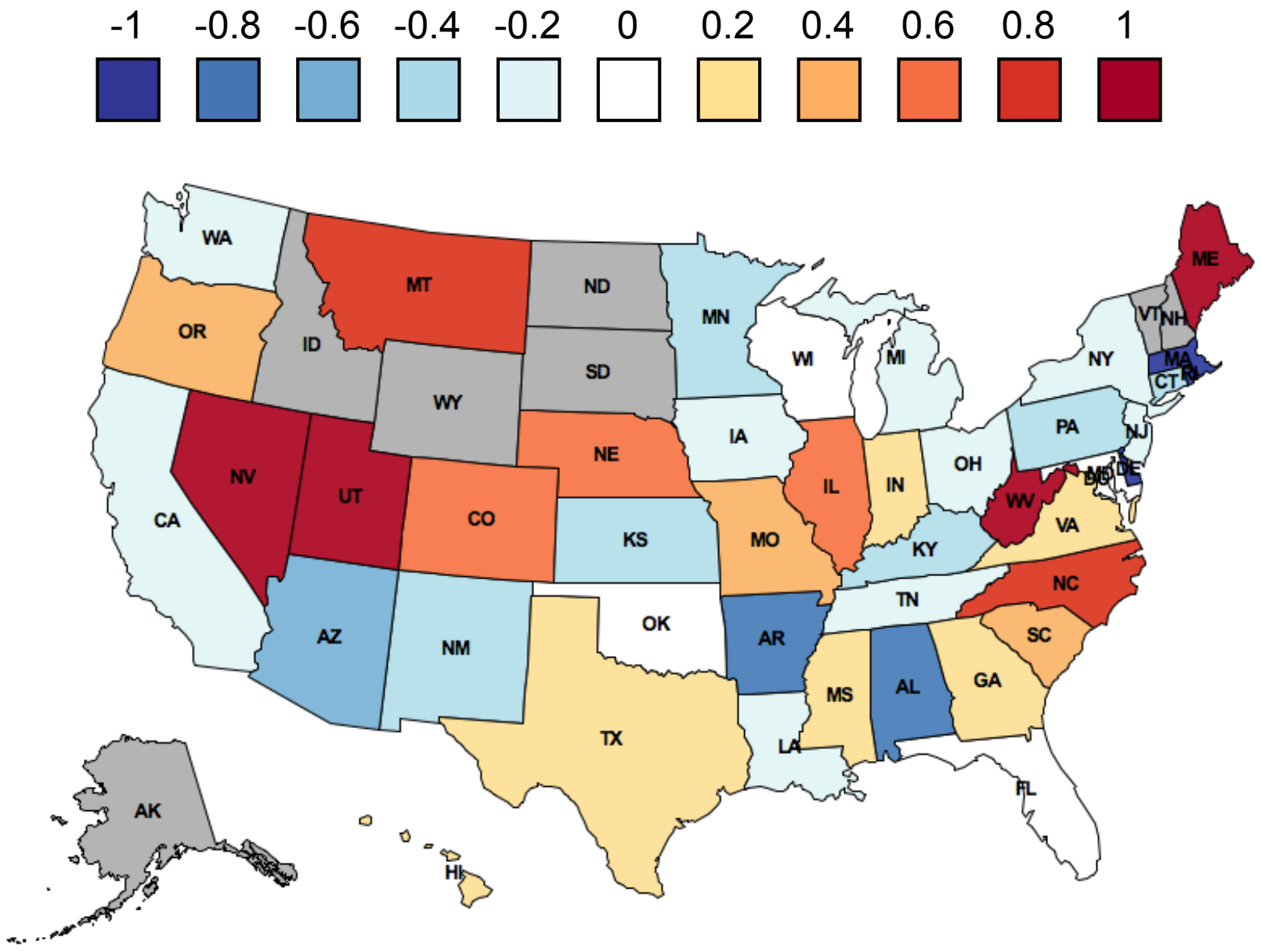

Finding the Centroid of a State

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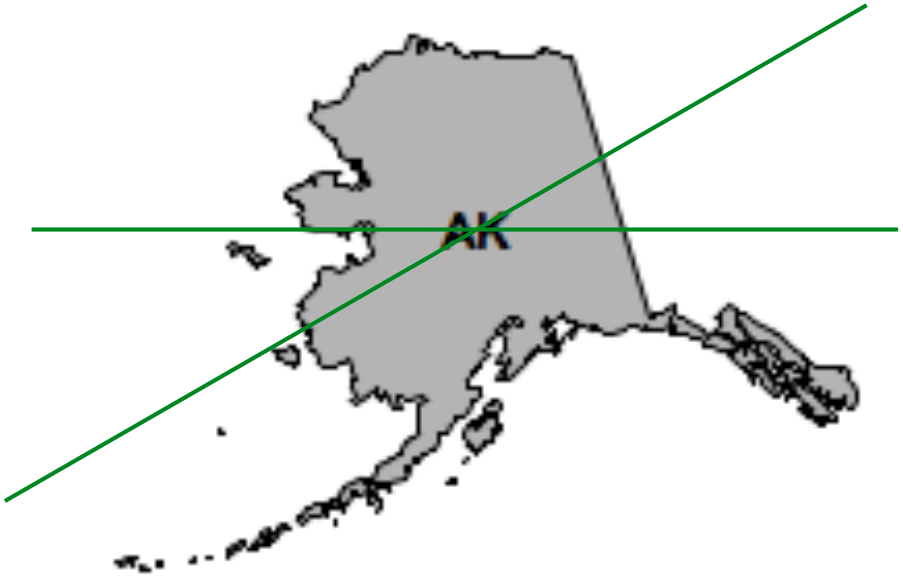

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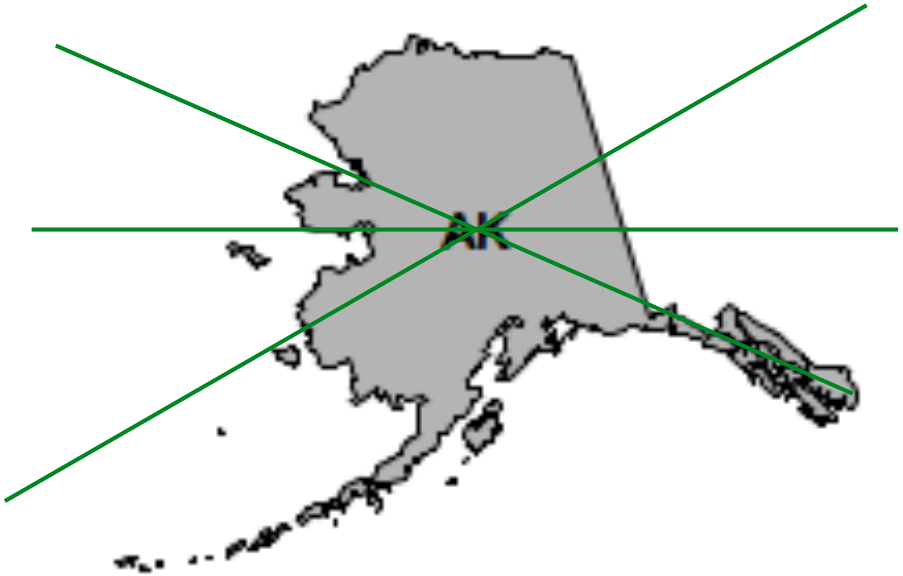

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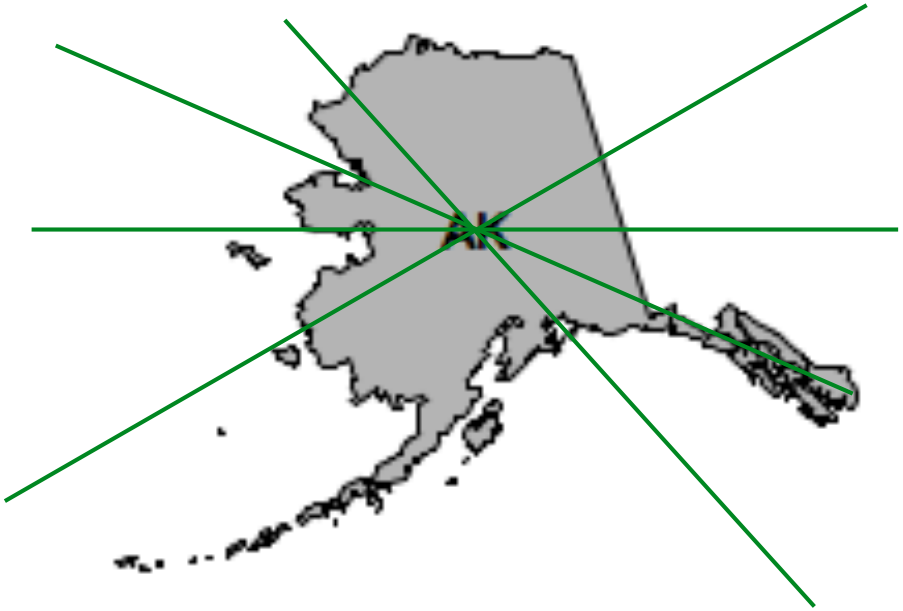

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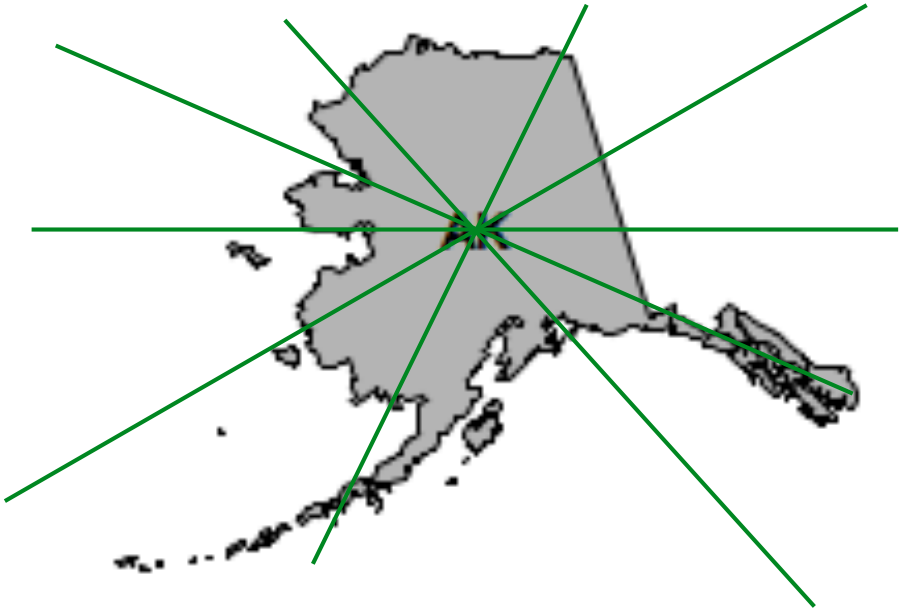
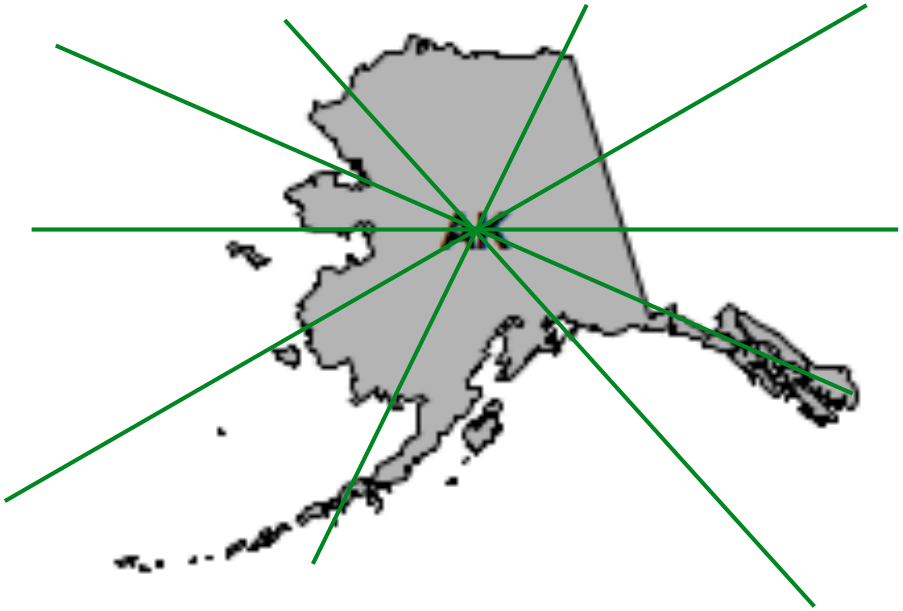


Finding the Centroid of a State

- Each state is represented by a sequence of polygons.



Finding the Centroid of a State

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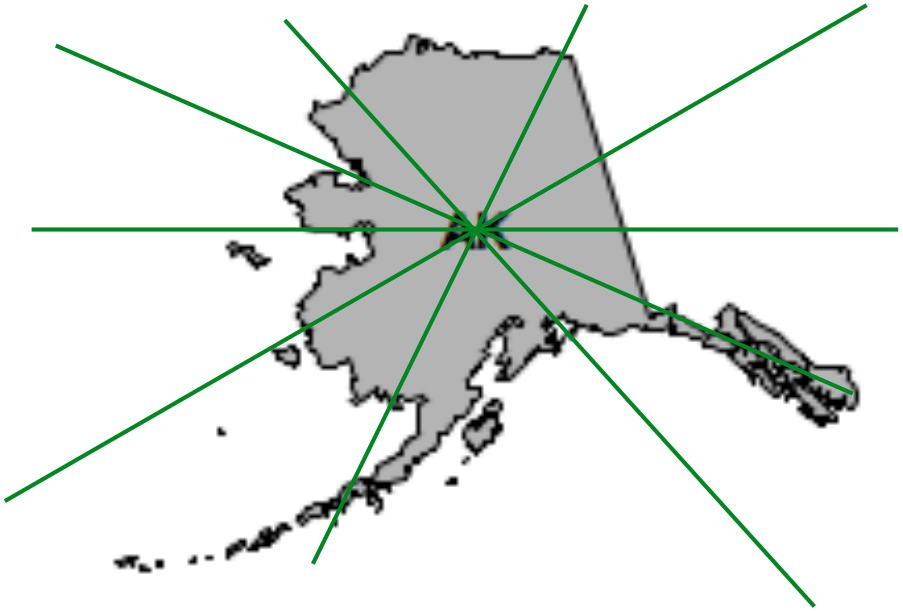
- Each polygon is represented by a sequence of positions.



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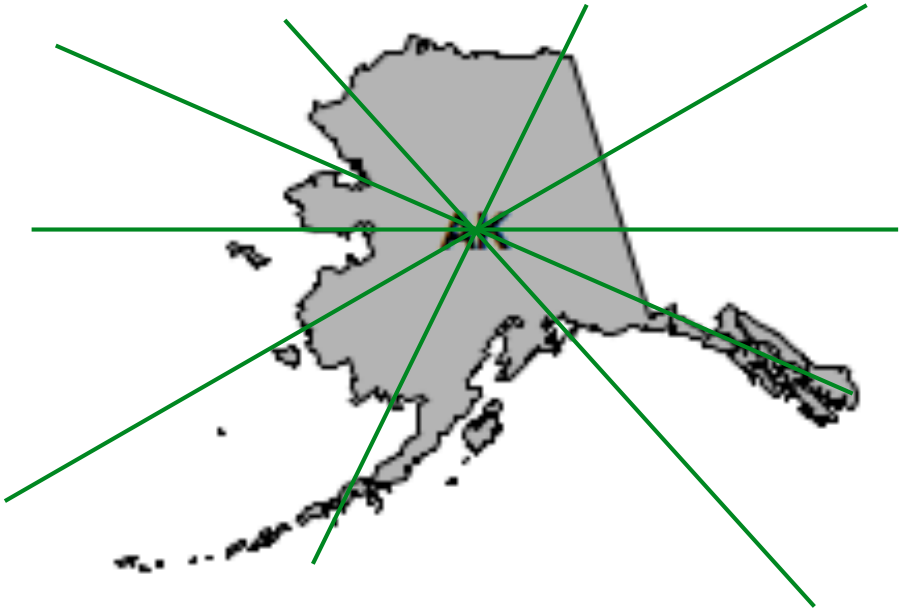

$$C_x = \frac{1}{6A}\sum_{i=0}^{n-1}(x_i + x_{i+1})(x_i\ y_{i+1} - x_{i+1}\ y_i)$$

$$C_y = \frac{1}{6A}\sum_{i=0}^{n-1}(y_i + y_{i+1})(x_i\ y_{i+1} - x_{i+1}\ y_i)$$

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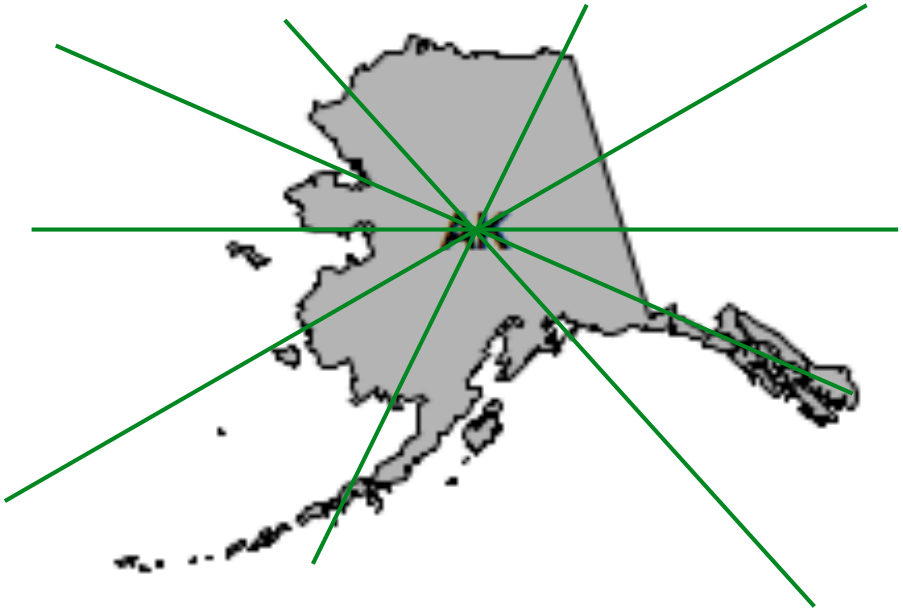

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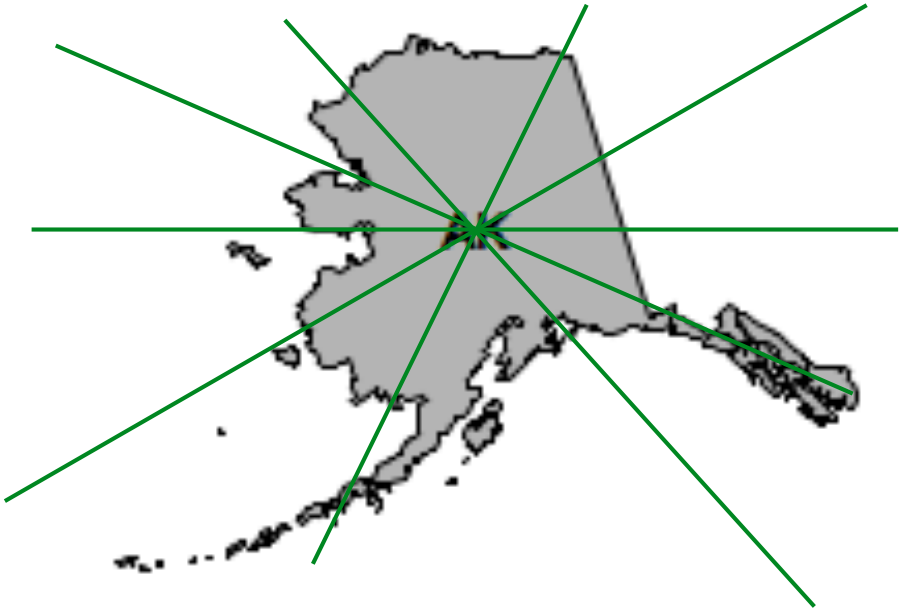

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- **(!)** Some students encounter floating point approximations.

Checking for Data Abstraction

An *abstract data type* is defined by its behavior,
and its use should be independent of its representation.

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```
def make_position(lat, lon):
    """Return a position..."""
    return (lat, lon)

def latitude(position):
    """Return the latitude..."""
    return position[0]

def longitude(position):
    """Return the longitude..."""
    return position[1]
```

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An *abstract data type* is defined by its behavior,
and its use should be independent of its representation.

```
def make_position(lat, lon):
    """Return a position..."""
    return (lat, lon) lambda x: lat if x else lon

def latitude(position):
    """Return the latitude..."""
    return position[0]  position(true)

def longitude(position):
    """Return the longitude..."""
    return position[1]  position(false)
```

Survey Results

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- Which project did you enjoy the most? (21.4% overall)
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  - Final grade of an A (14.5%), B (**25.7%**), or C (16.7%)
- Which project taught you the most? (7.8% overall)
  - Female (**8.2%**) versus male (7.8%)
  - Final grade of an A (3.2%), B (8.8%), or C (**13.9%**)