

Art Identifier

A. Utku Kale



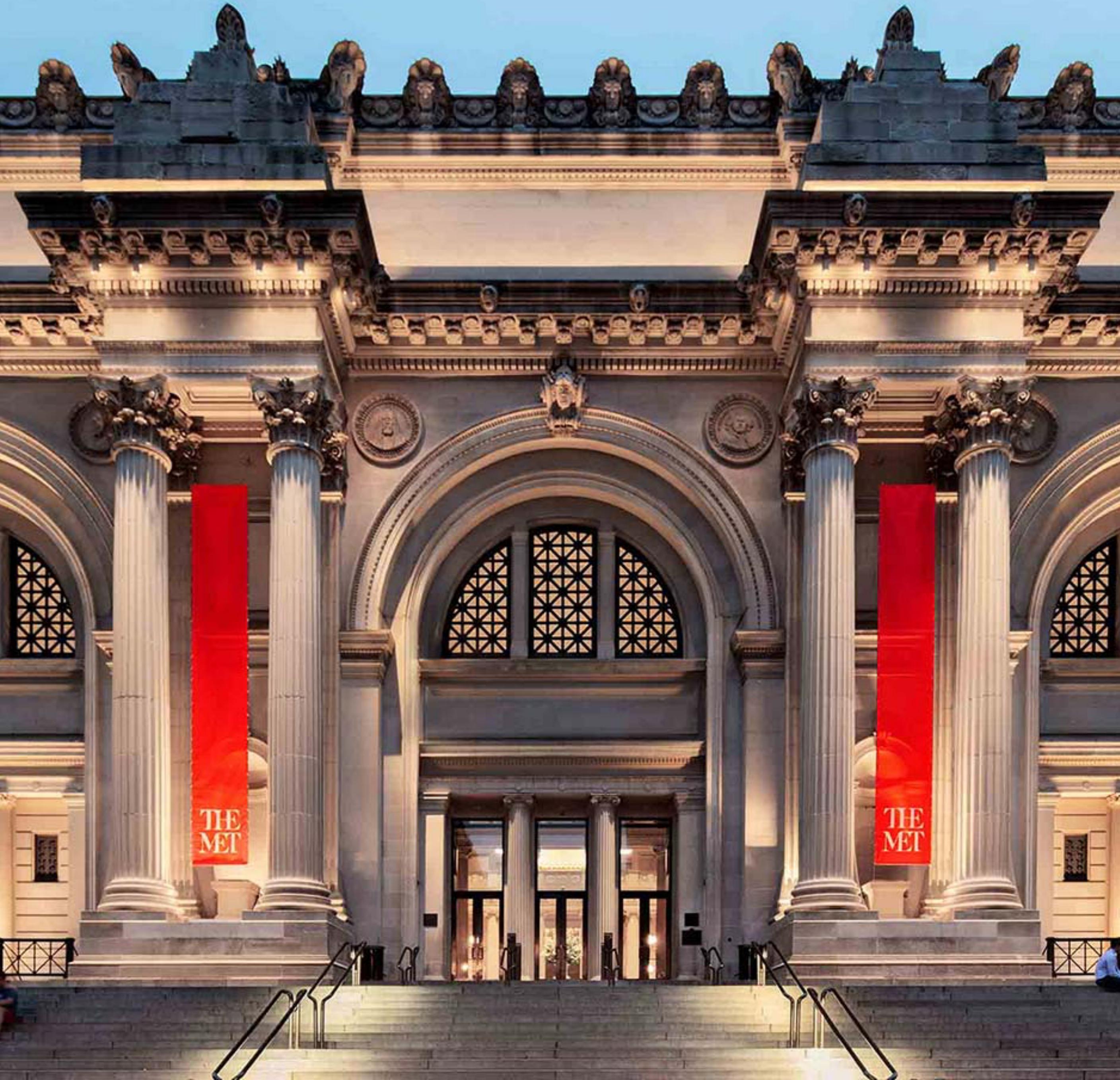
Overview

- Business Problem
- Data & Models
- Conclusions
- Next Steps



Business Problem

- The MET needs an extra layer of security to help with the authentication and verification of paintings acquired from collectors or dealers.
- Want to use machine learning to identify the painter of the art pieces.



Data

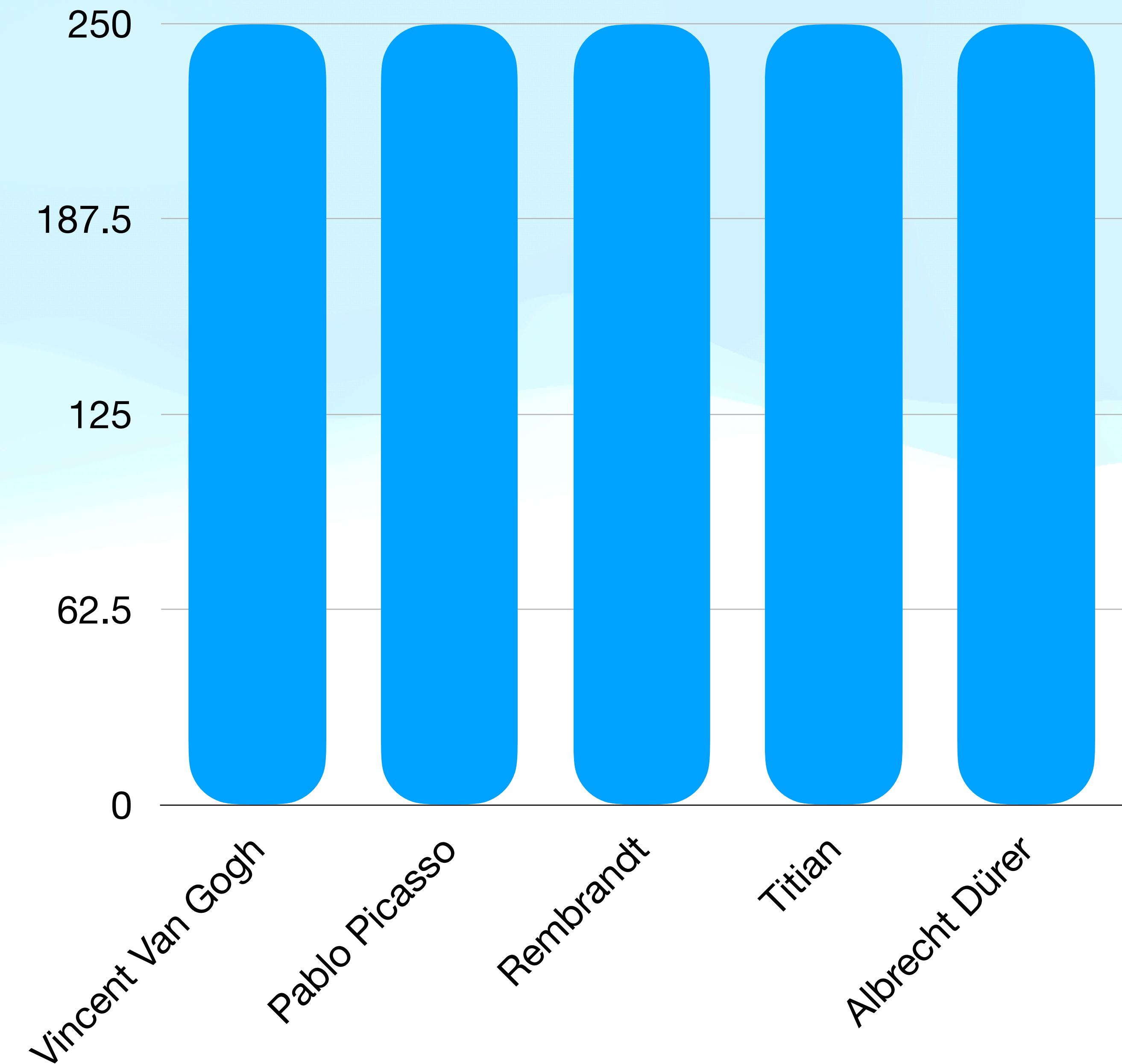
Dataset

- Best Artworks of All Time from Kaggle
- 8400+ art pieces from 50 most influential artists of all time

Artists

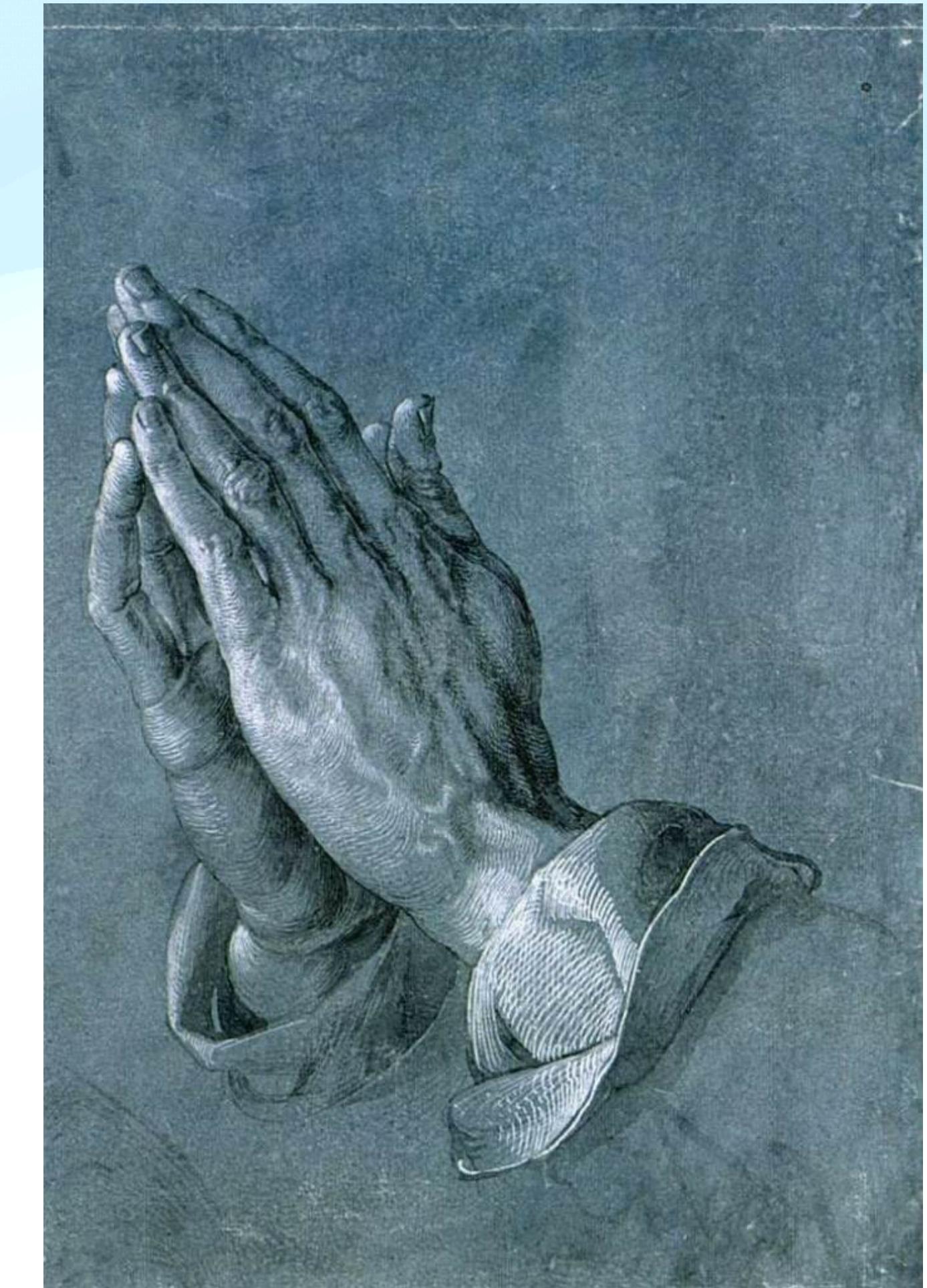
- Van Gogh
- Picasso
- Rembrandt
- Titian
- Dürer

Painting Count



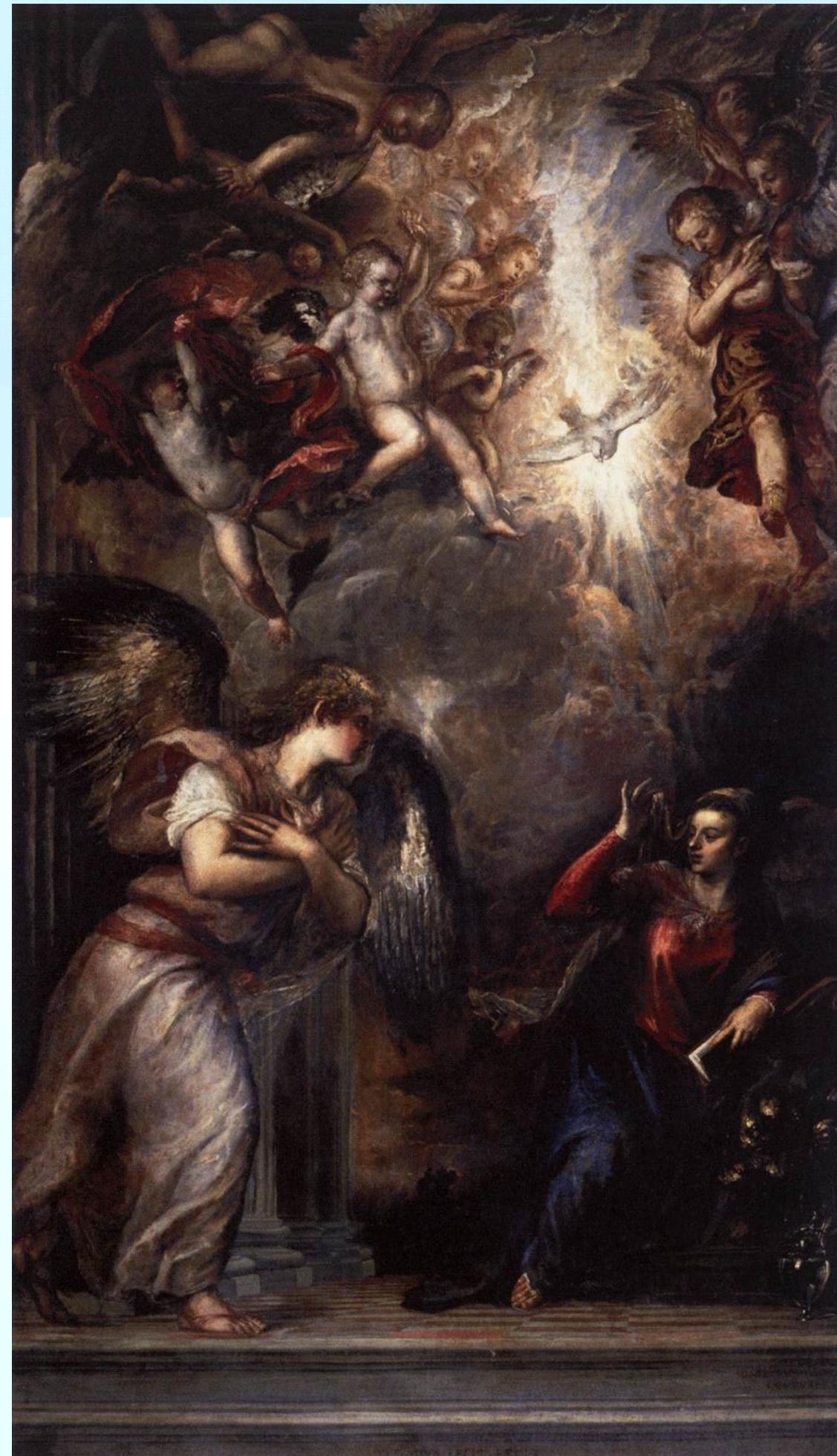
Observing Sample Data

Albrecht Dürer (1471-1528) - Genre: Northern Renaissance / 16th ctr.



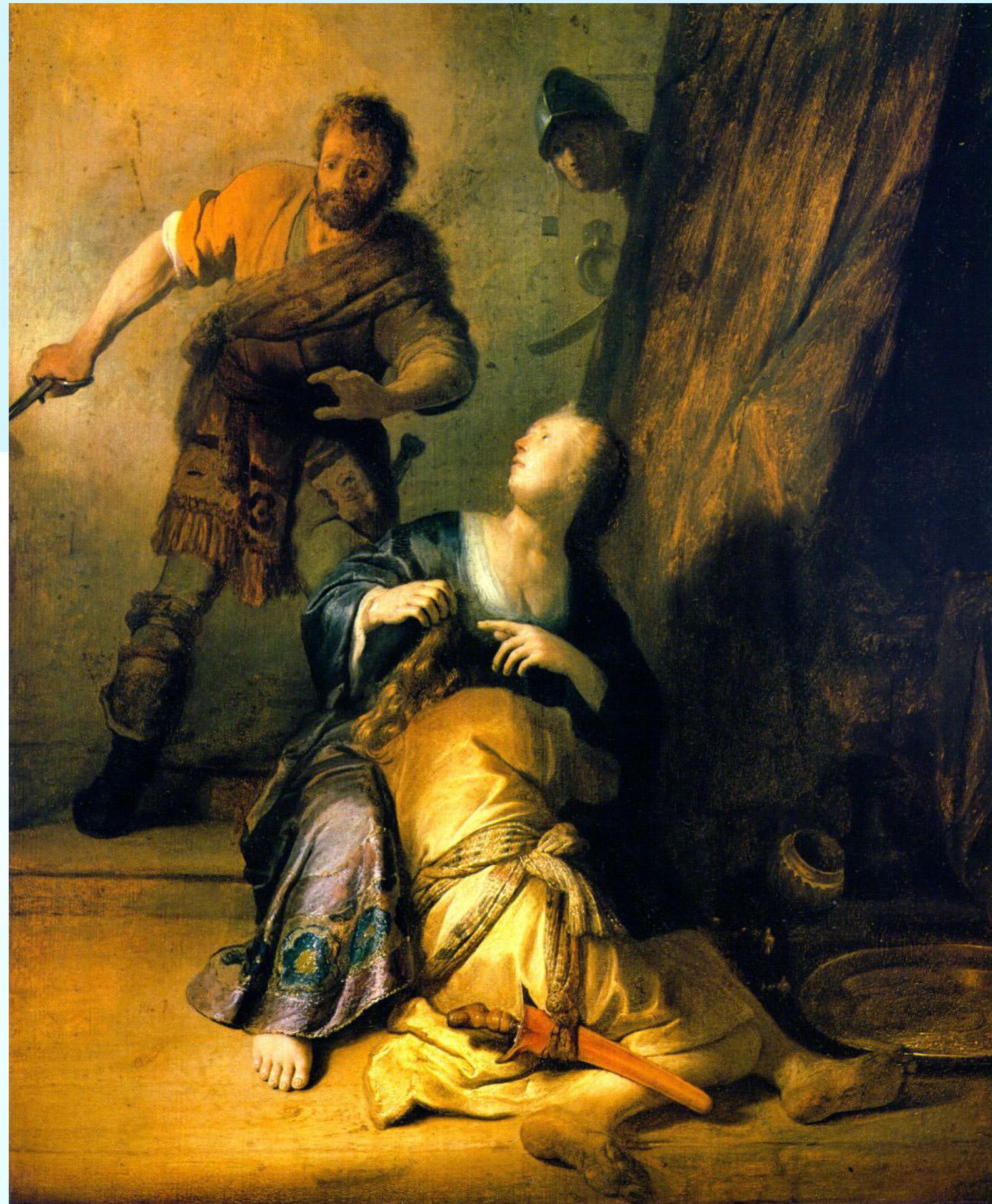
Observing Sample Data

Titian (1488-1576) - Genre: High Renaissance / 16th ctr.



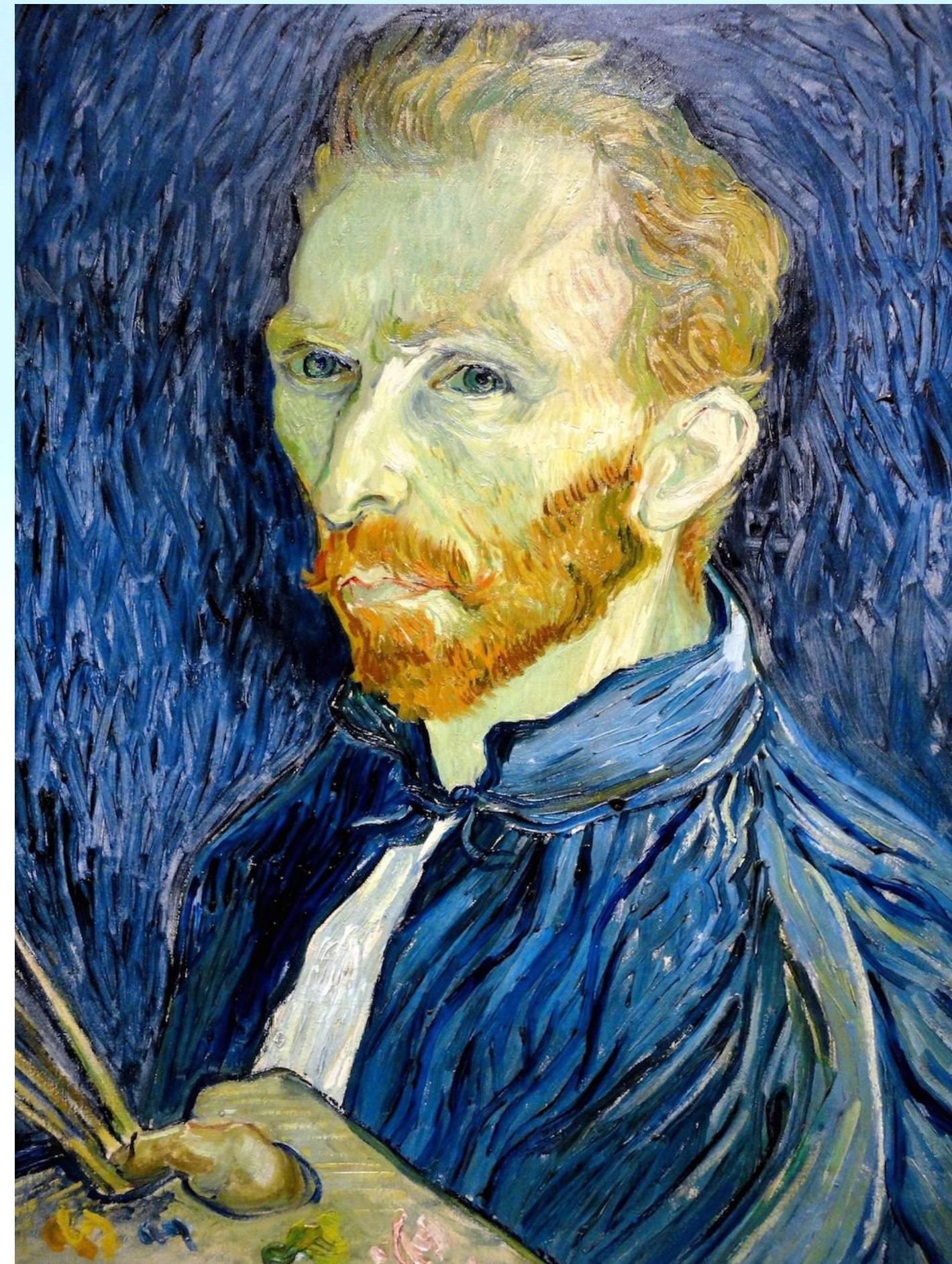
Observing Sample Data

Rembrandt (1606-1669) - Genre: Baroque / 17th ctr.



Observing Sample Data

Vincent Van Gogh (1853-1890) - Genre: Post-Impressionism / 19th ctr.



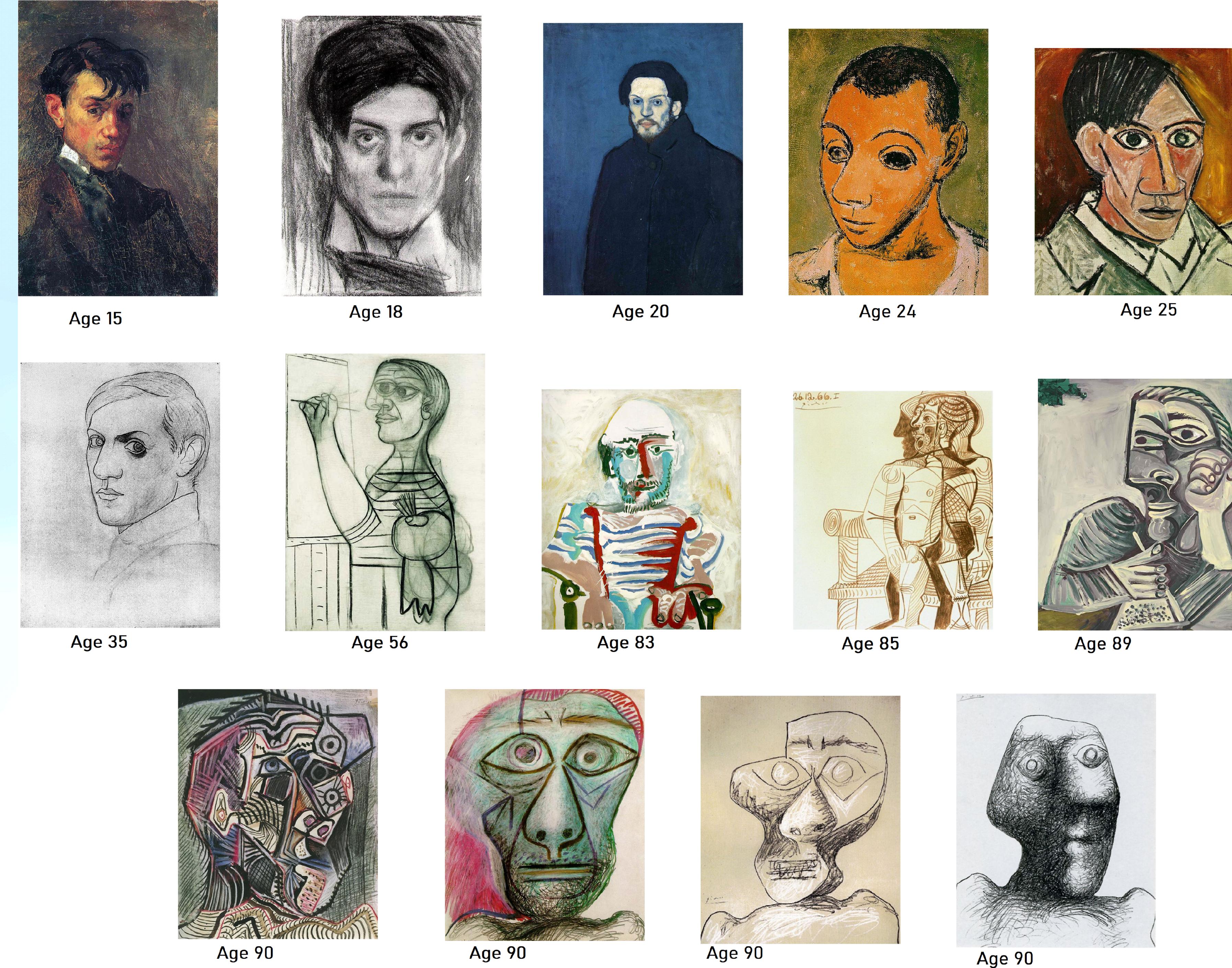
Observing Sample Data

Pablo Picasso (1881-1973) - Genre: Cubism / 20th ctr.



Observing Sample Data

Pablo Picasso
(1881-1973) -
Genre: Cubism /
20th ctr.



Initial Models

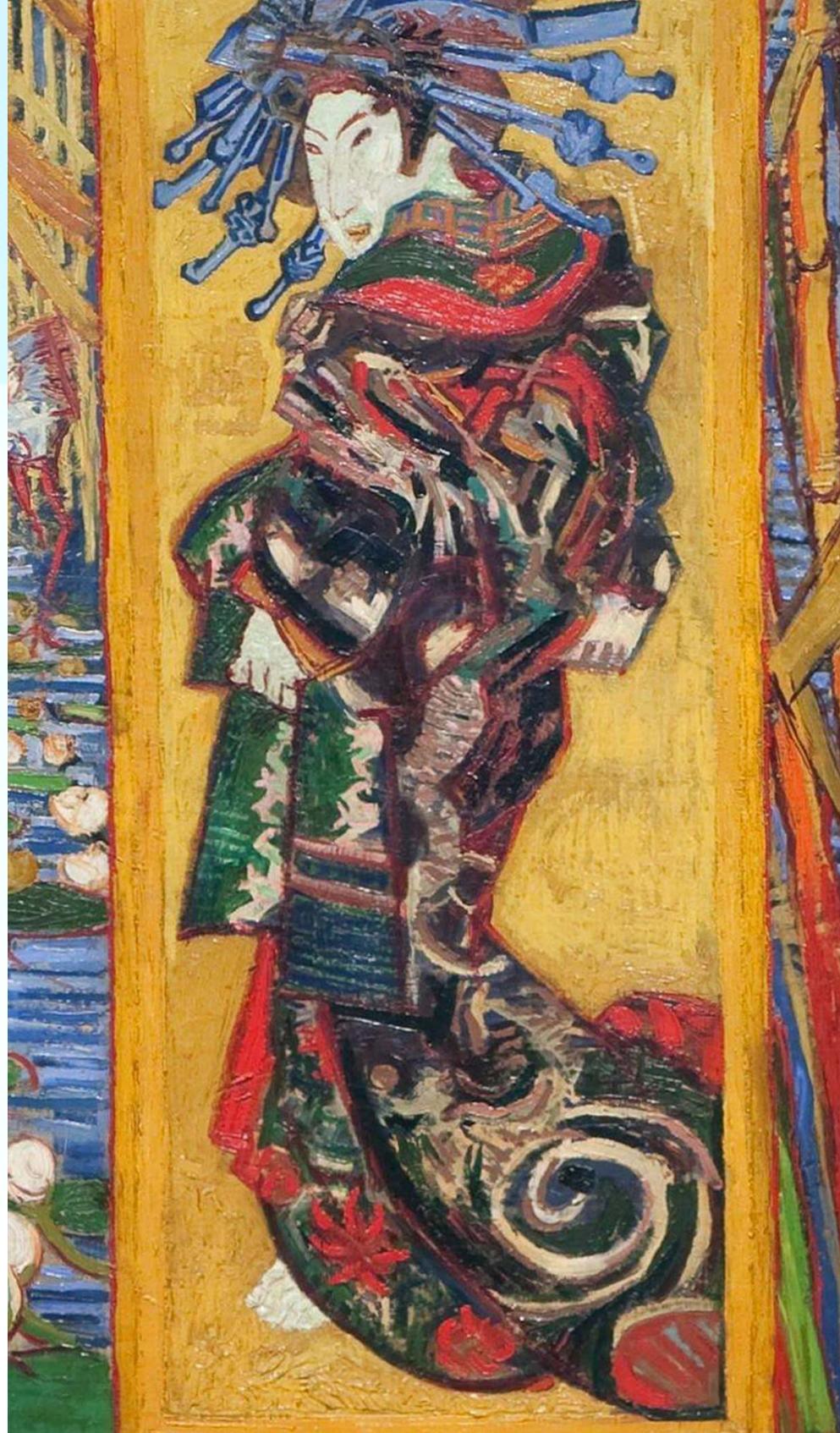
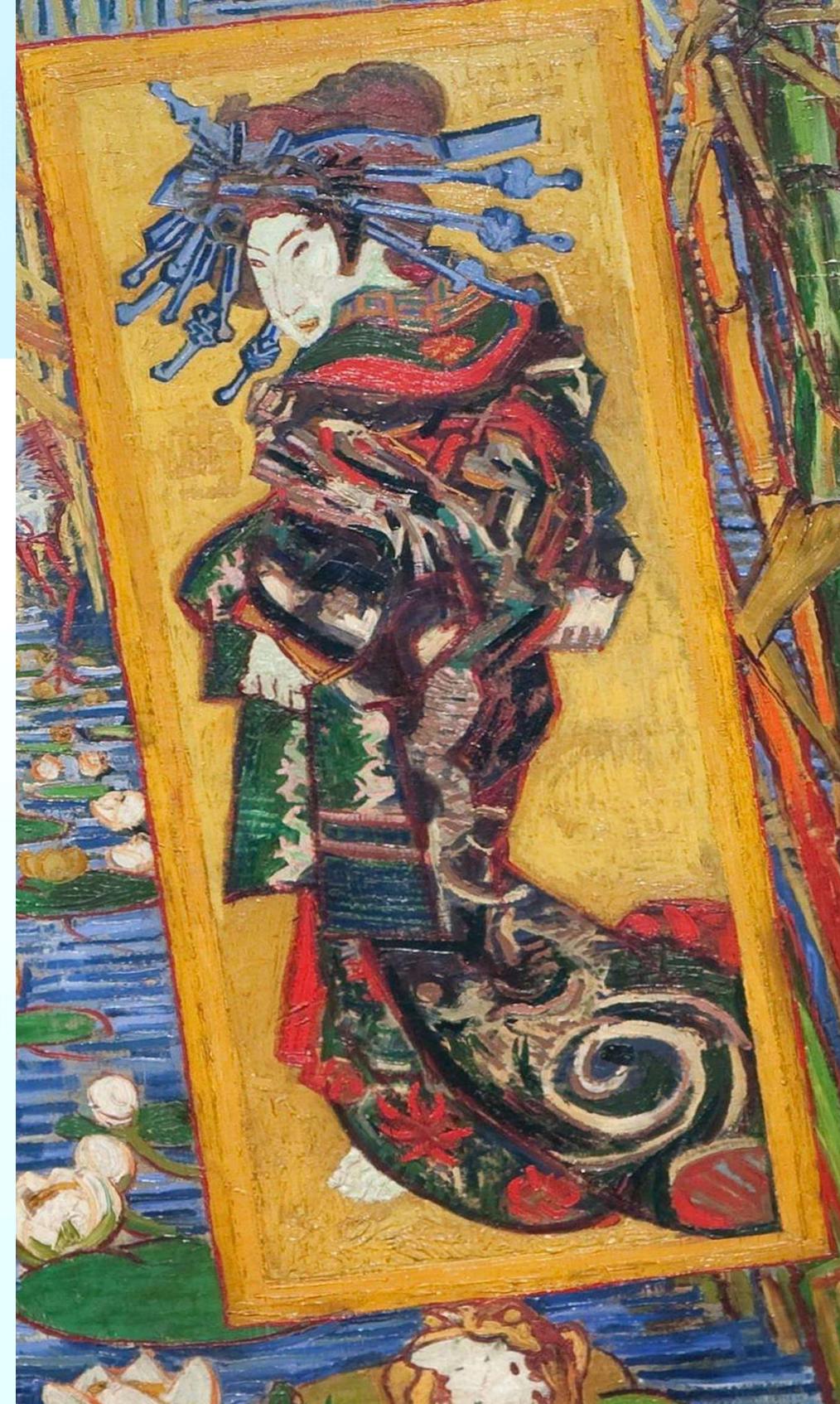
CNN - Metric: Accuracy

Models/Scores	Train Score	Validation Score	Test Score
Base CNN	0.8549	0.6680	0.6639
CNN Dropout	0.80	0.64	0.6320
VGG16	0.9246	0.82	0.7599

Image Data Preprocessing

Augmentation

Increased training dataset from 875 image to 2500 image



Advanced Models - Top 3

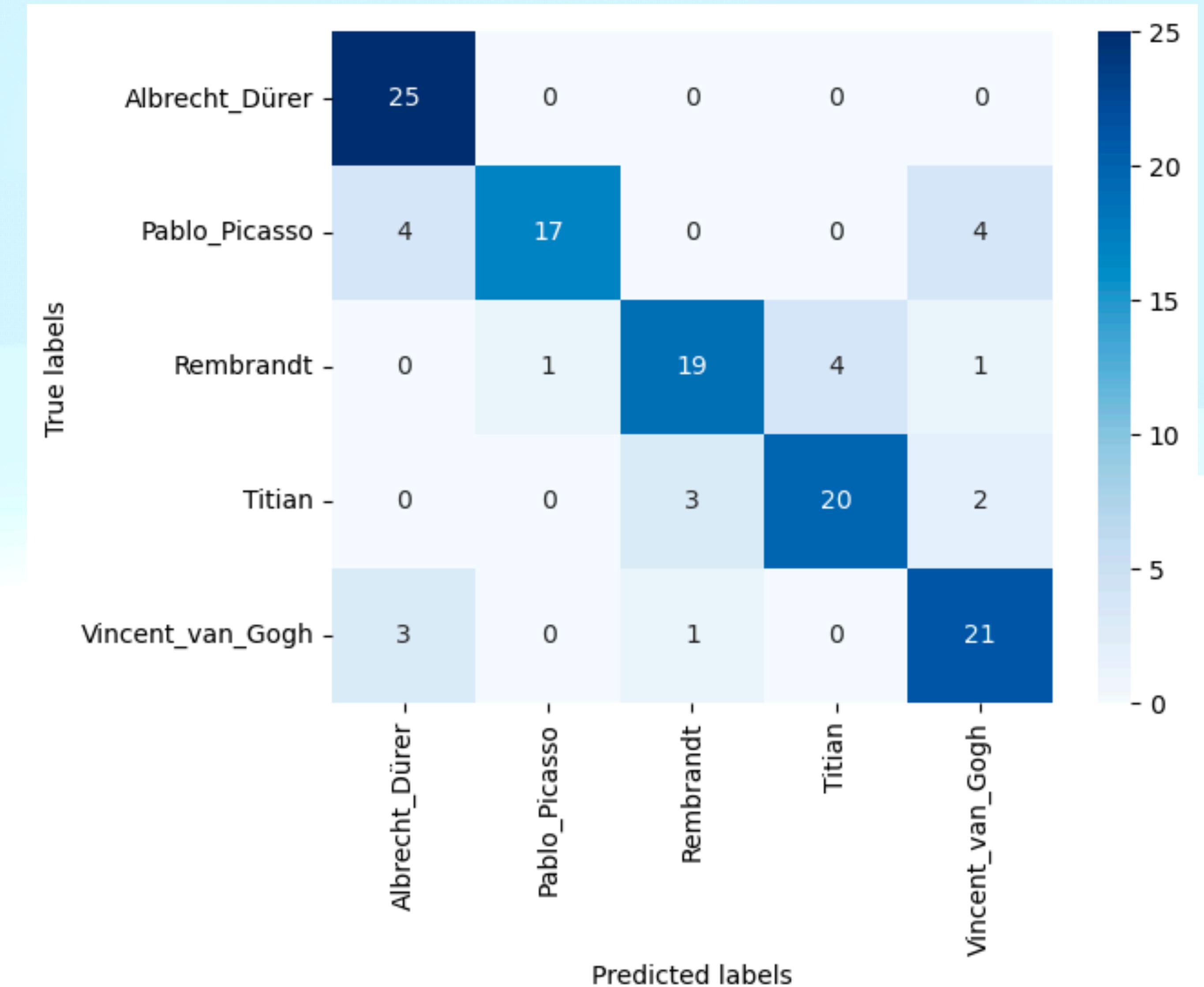
Metric is Accuracy

Models/Scores	Train Score	Validation Score	Test Score
CNN	0.90	0.60	0.6399
Regularized CNN	0.8668	0.6907	0.6800
VGG19	0.90	0.78	0.8159

Evaluation

Best model! - VGG19

- Accuracy of 81.6%



Misclassified Images

True: Pablo_Picasso
Predicted: Albrecht_Dürer



True: Pablo_Picasso
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True: Pablo_Picasso
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True: Pablo_Picasso
Predicted: Albrecht_Dürer



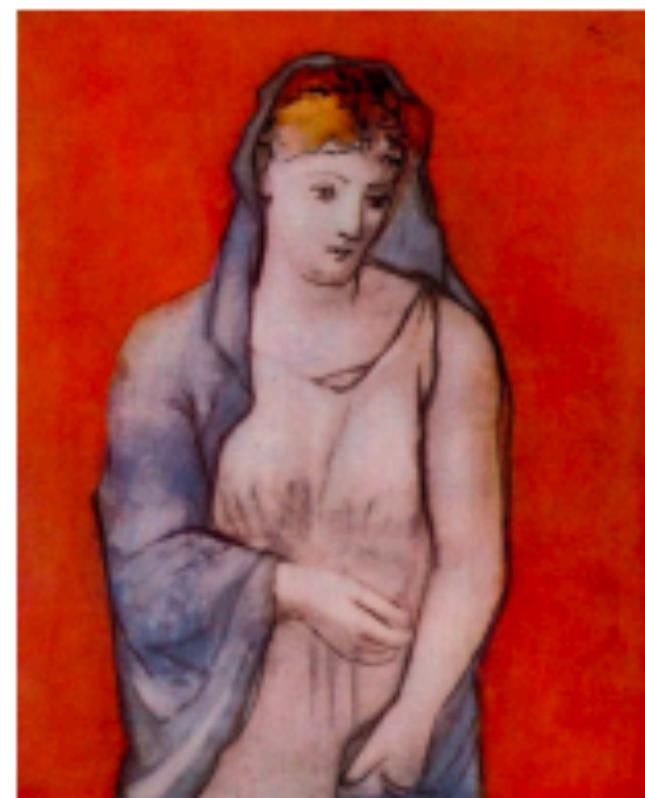
True: Pablo_Picasso
Predicted: Vincent_van_Gogh



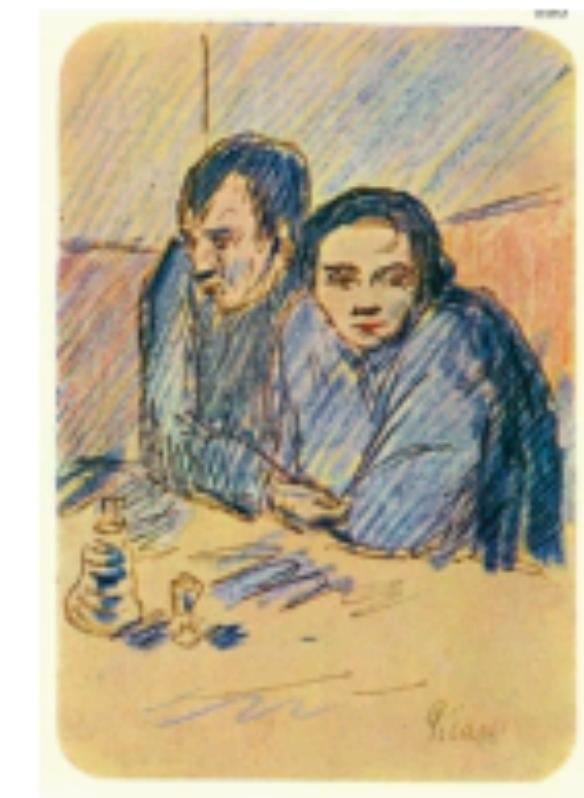
True: Pablo_Picasso
Predicted: Vincent_van_Gogh



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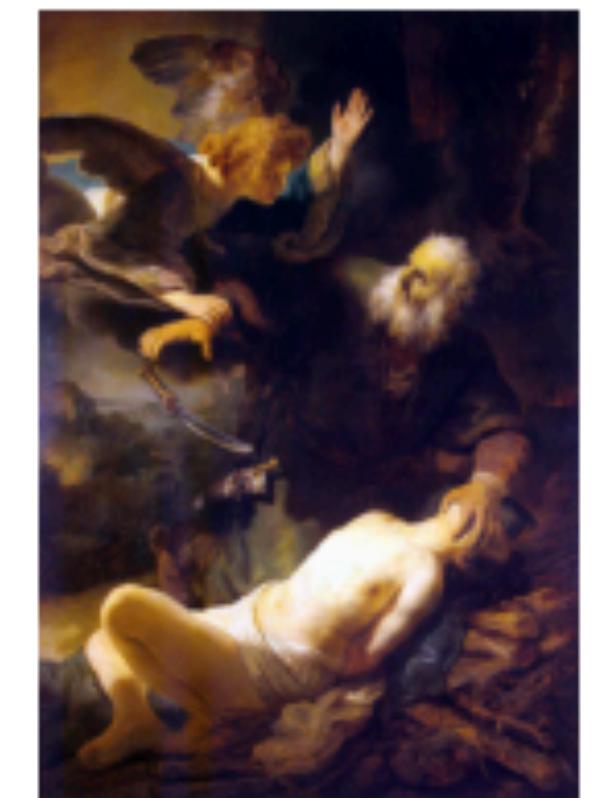
True: Pablo_Picasso
Predicted: Vincent_van_Gogh



True: Rembrandt
Predicted: Titian



True: Rembrandt
Predicted: Titian



Conclusion

- The MET can use this model to create an extra layer of security when receiving art pieces from collectors, dealers or other art institutions.
- The use of the artist identifier can help to prevent the spread of forgeries and imitations in the art market by providing a reliable and objective means of authentication.
- This project can bridge the gap between technology and art, encouraging more collaboration between these fields.

Future Improvements

- Building a model that can tell an art piece is original or AI generated imitation
- Increasing number of the target painters
- Working with more data to make accurate models

Questions?

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