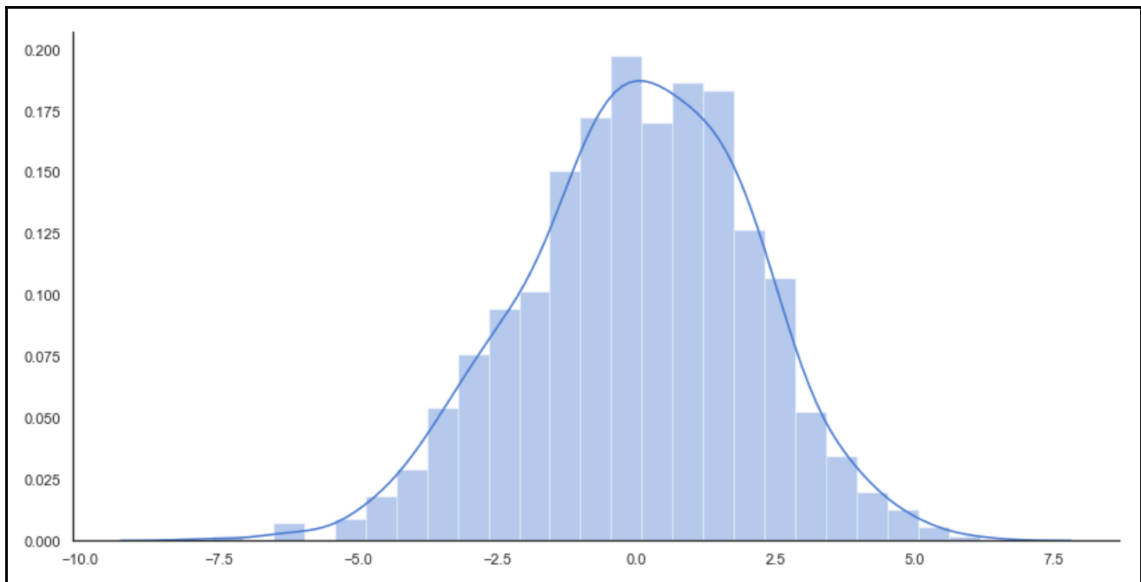
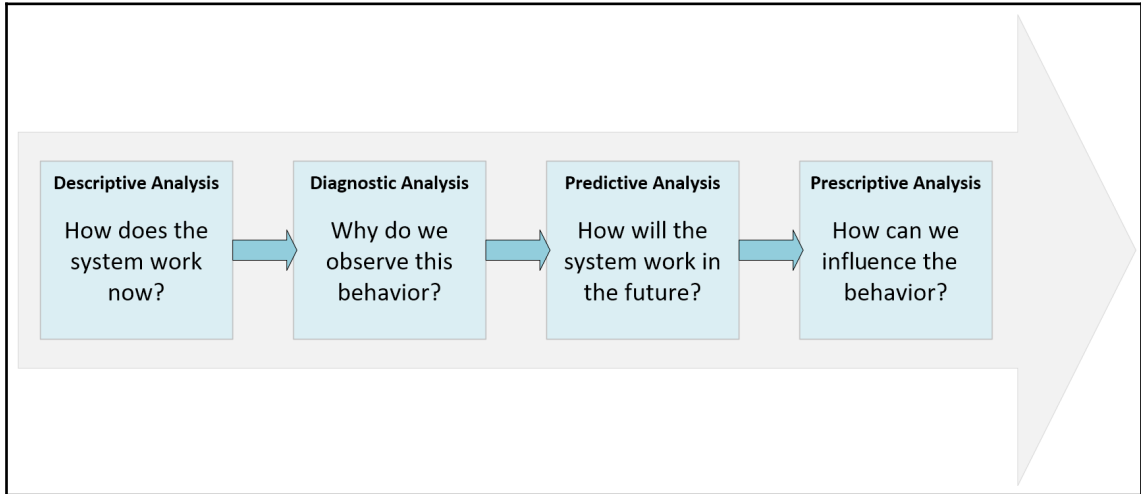
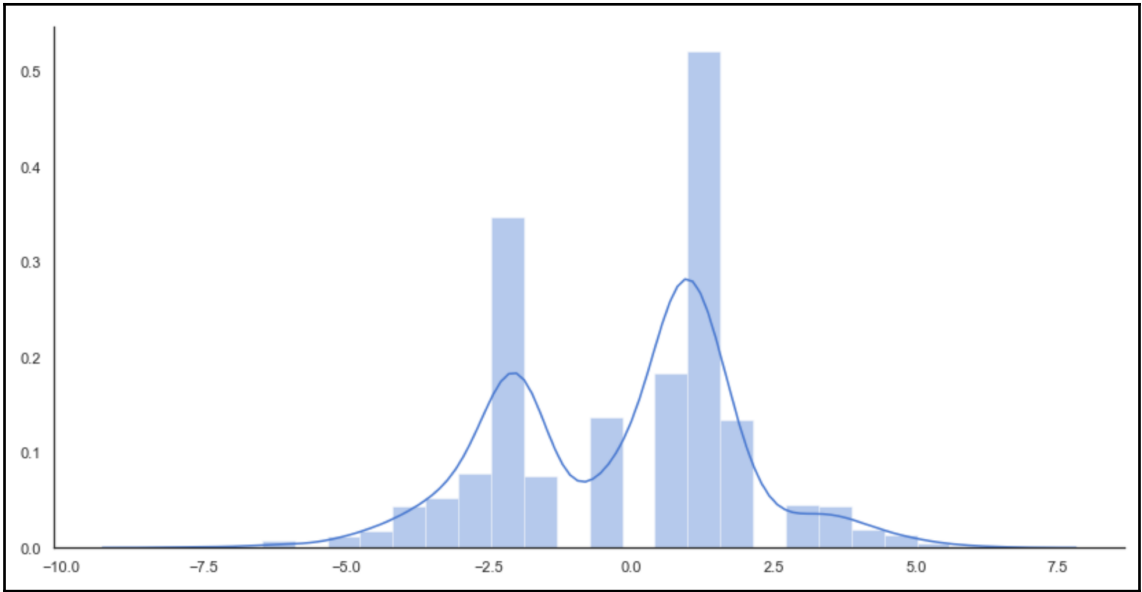
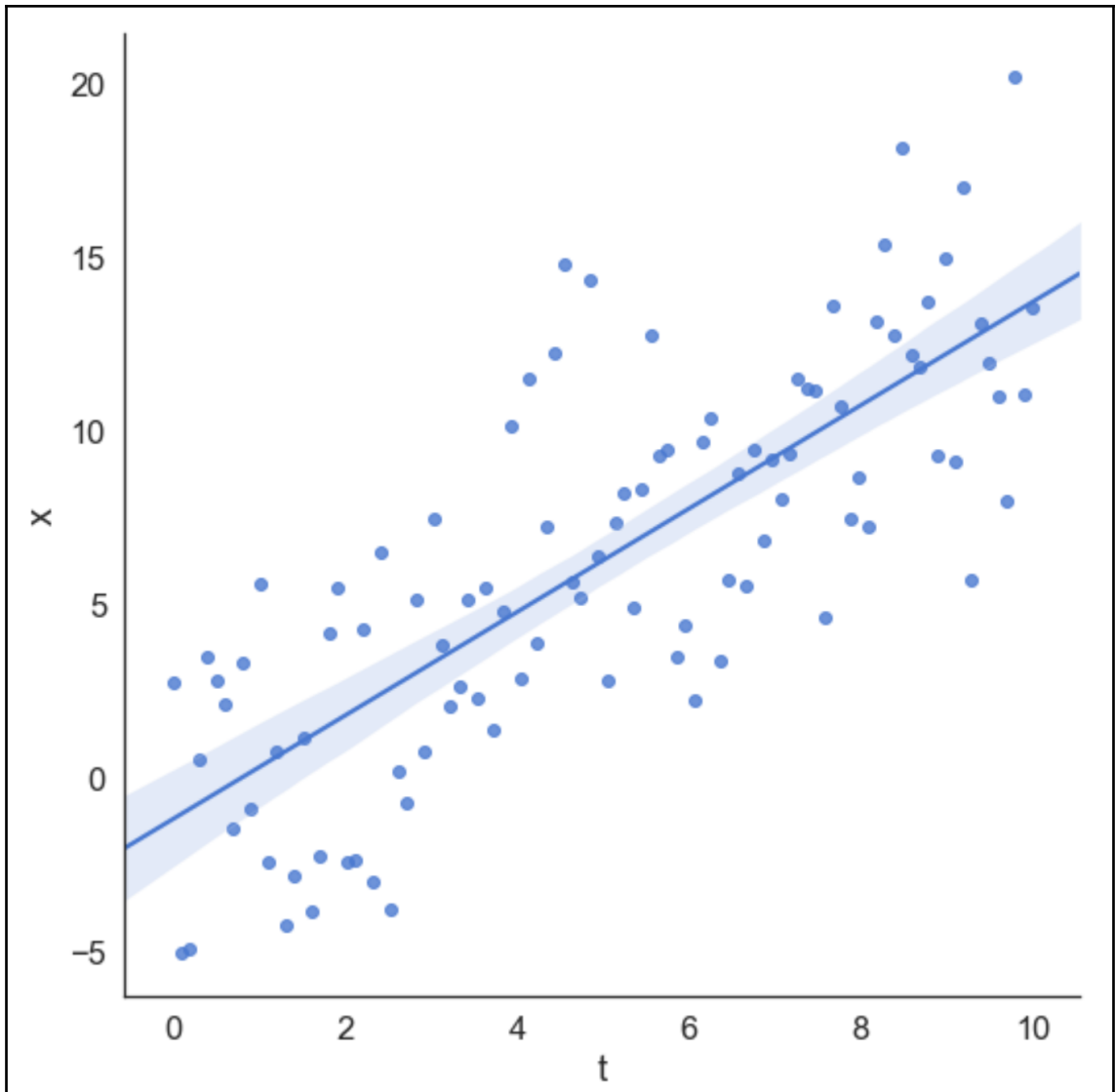
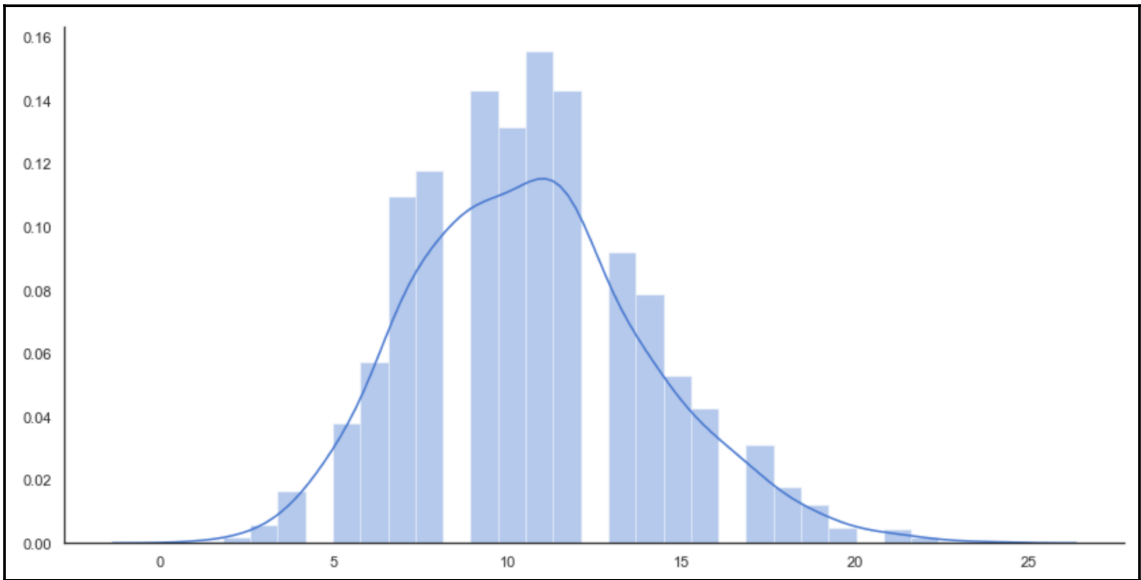
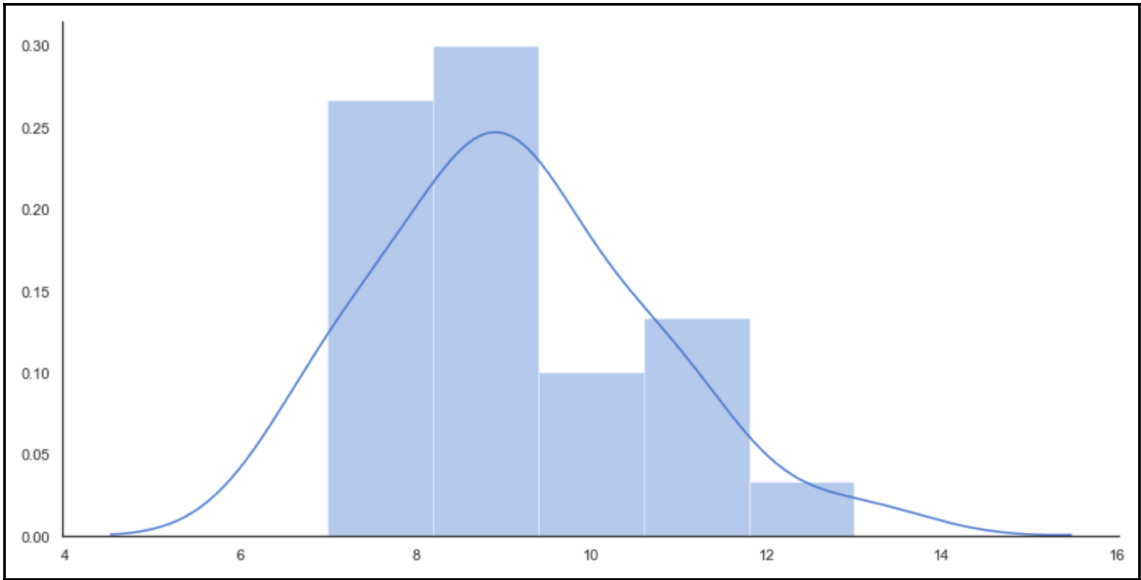


# Chapter 1: Getting Started with Unsupervised Learning





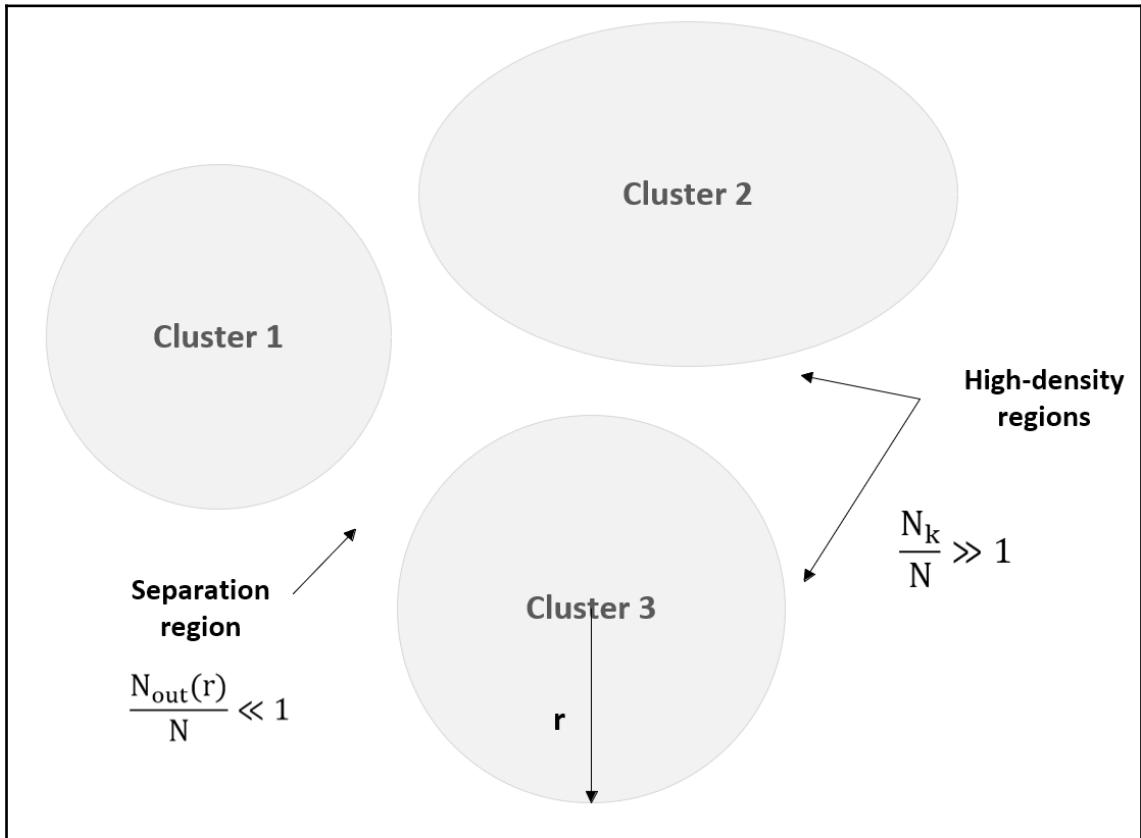


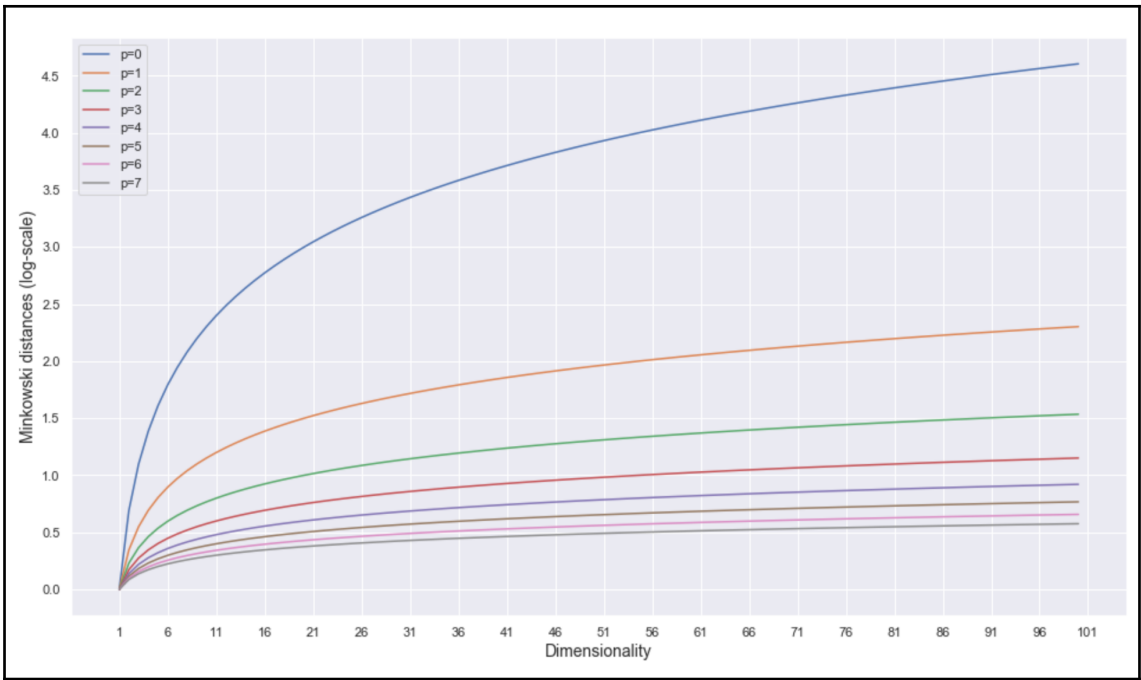
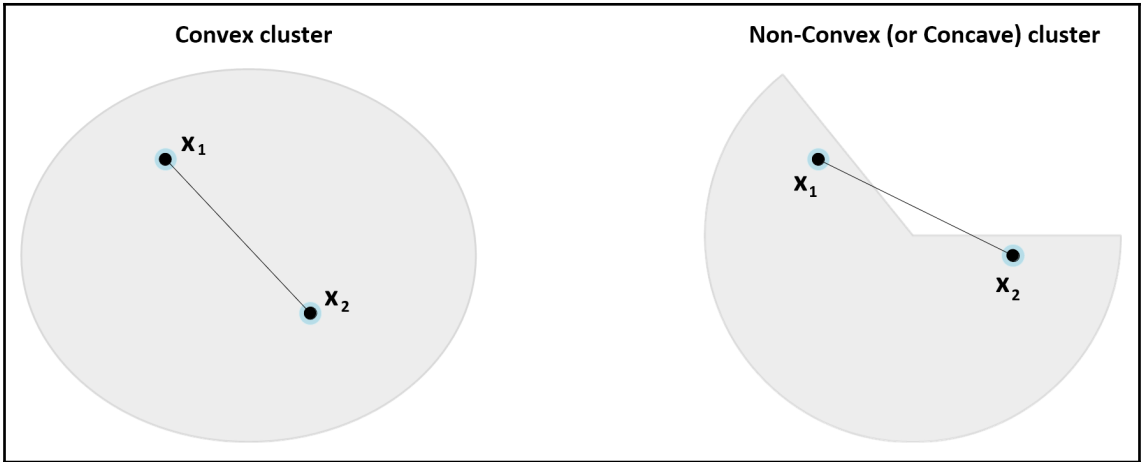




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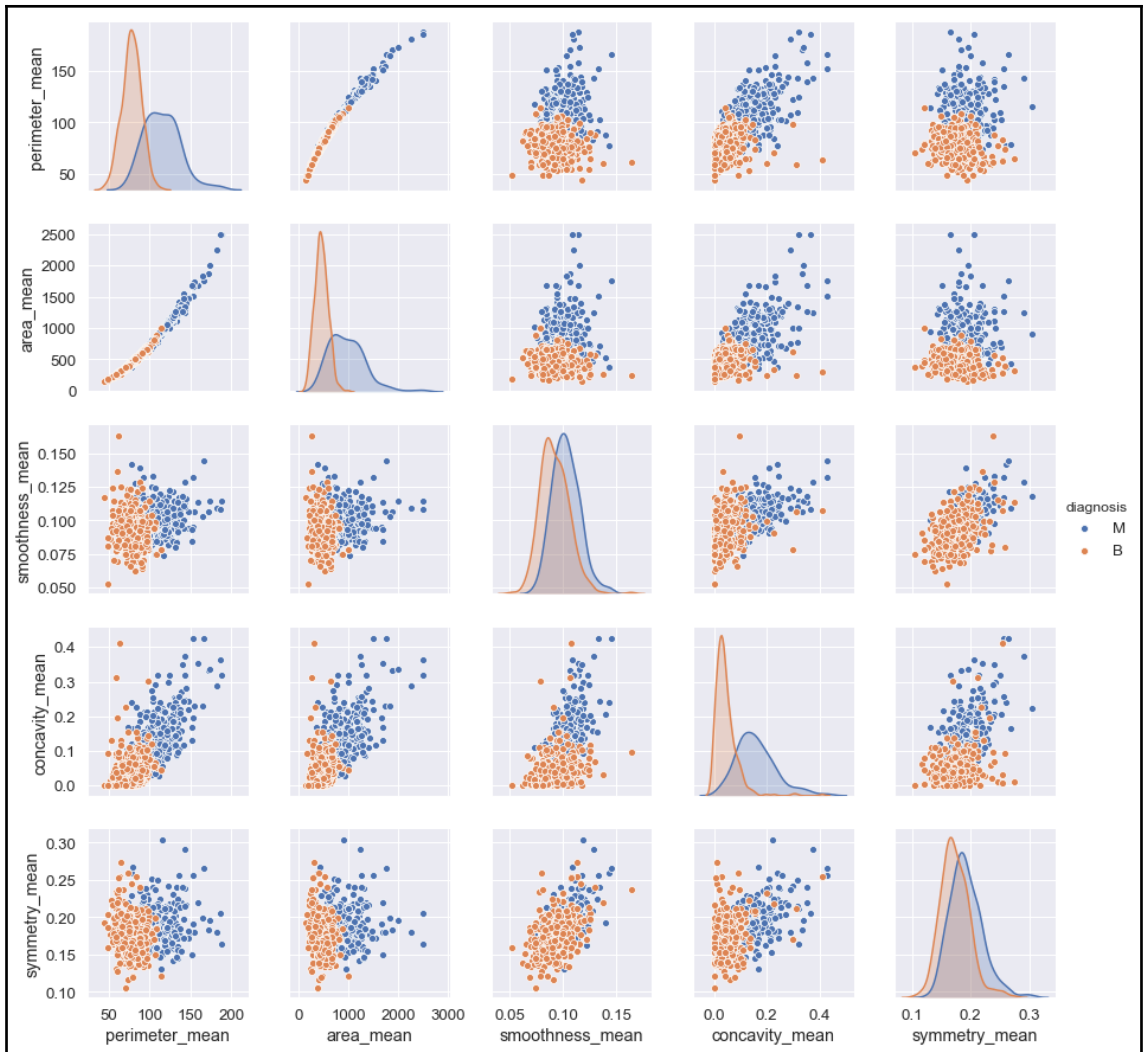
## Chapter 2: Clustering Fundamentals

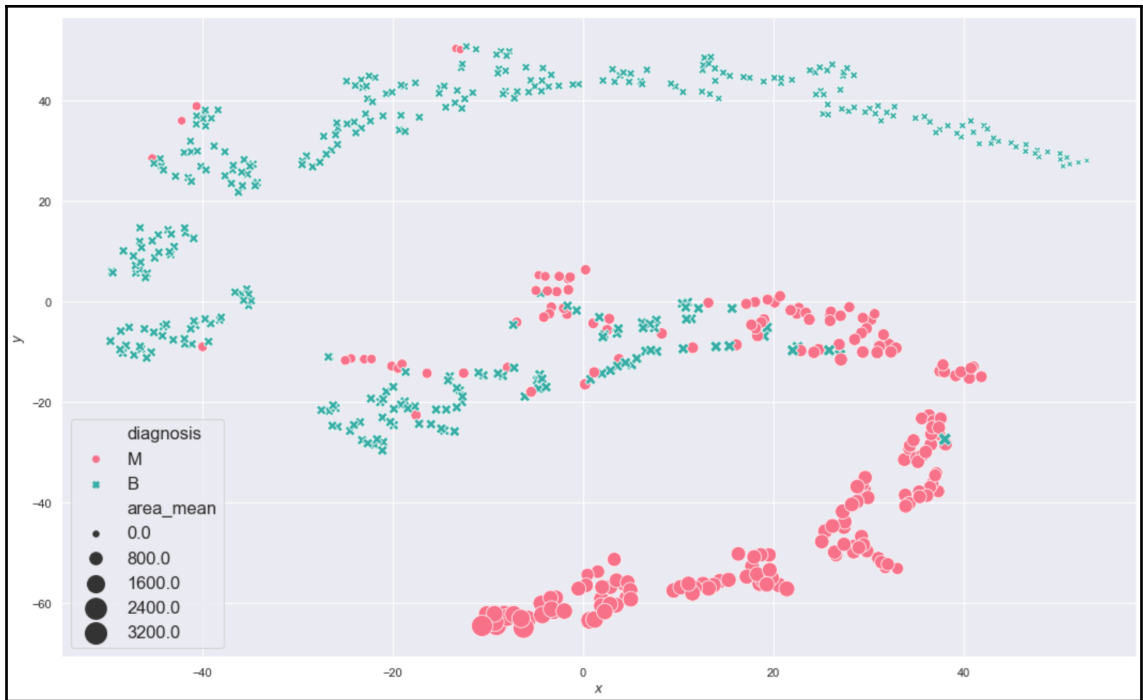


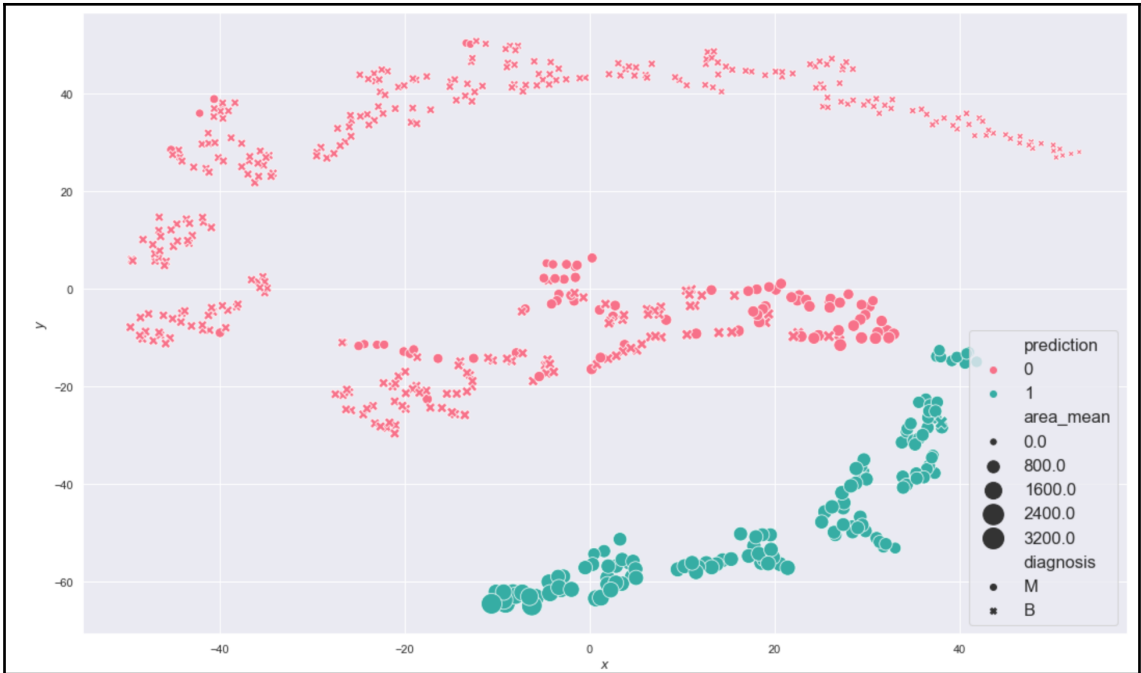


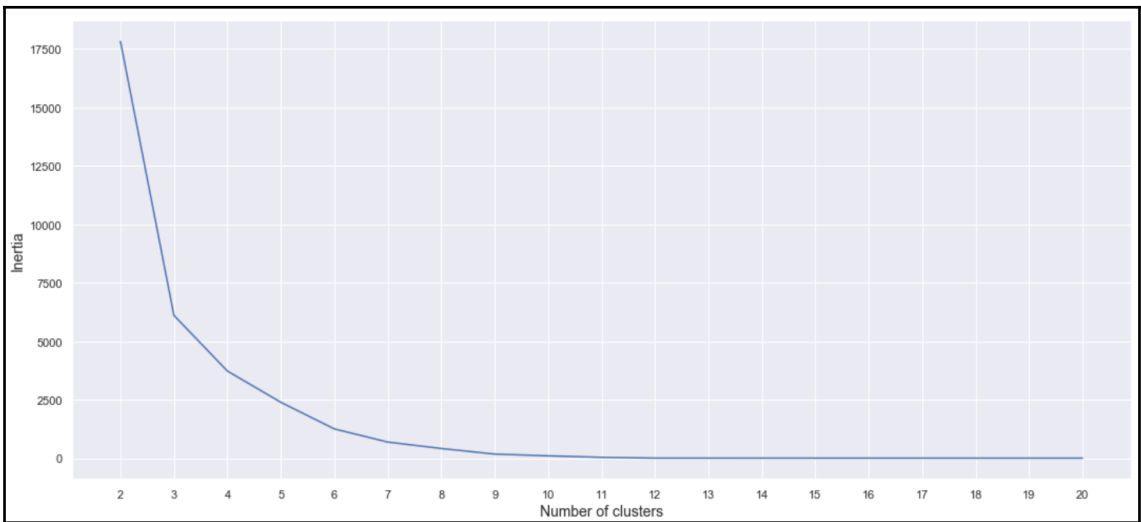
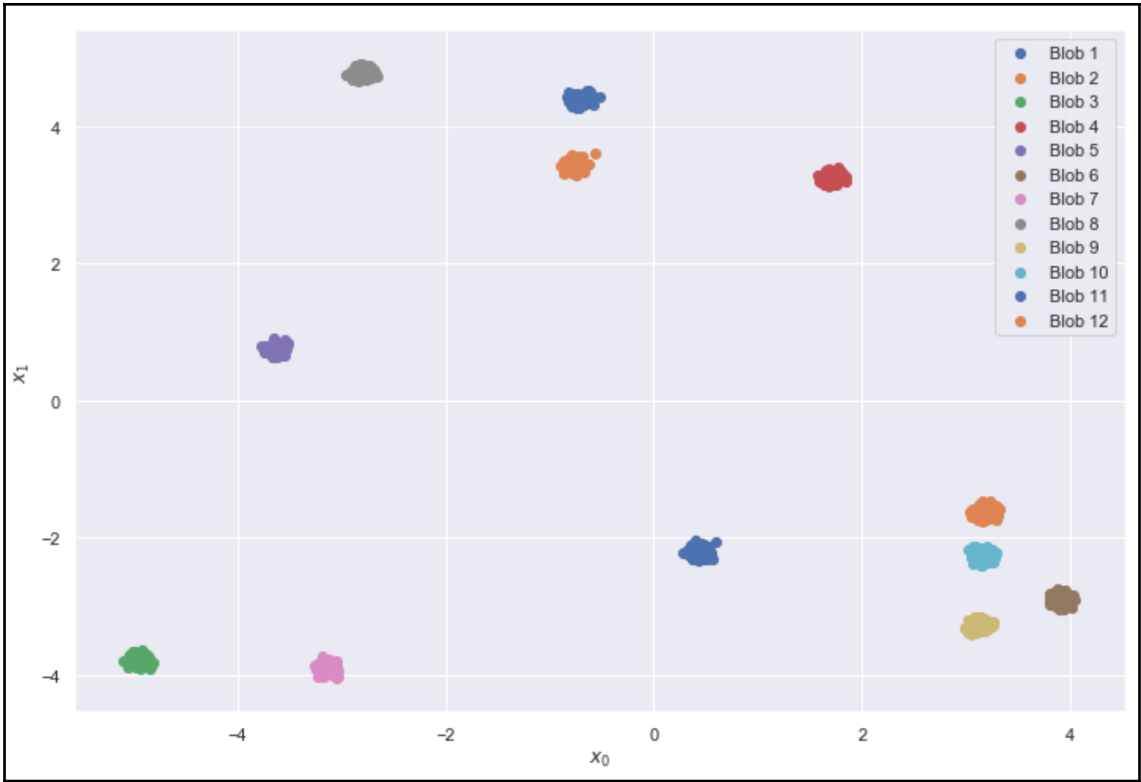
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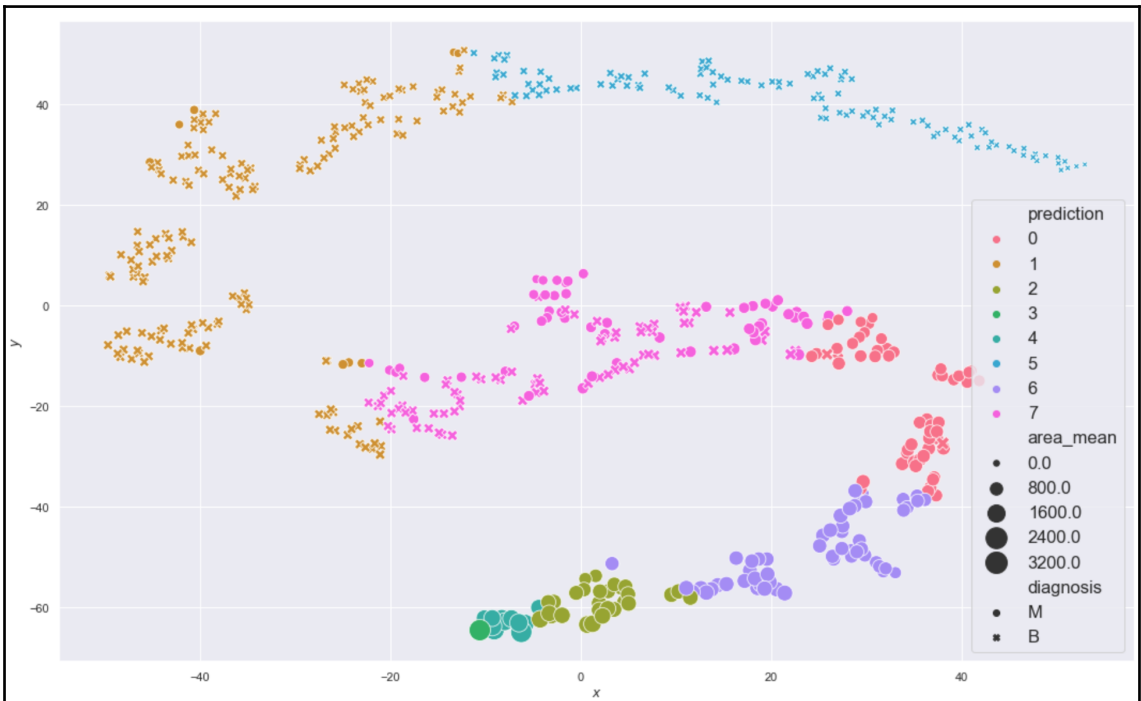
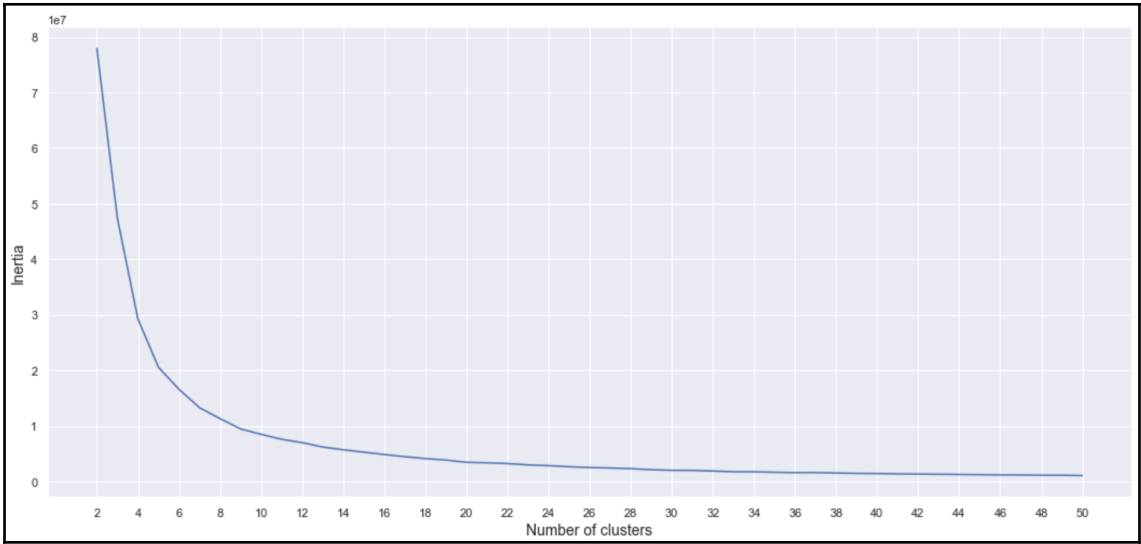
|              | radius_mean | texture_mean | perimeter_mean | area_mean   | smoothness_mean | compactness_mean | concavity_mean | concave points_mean |
|--------------|-------------|--------------|----------------|-------------|-----------------|------------------|----------------|---------------------|
| <b>count</b> | 569.000000  | 569.000000   | 569.000000     | 569.000000  | 569.000000      | 569.000000       | 569.000000     | 569.000000          |
| <b>mean</b>  | 14.127292   | 19.289649    | 91.969033      | 654.889104  | 0.096360        | 0.104341         | 0.088799       | 0.048919            |
| <b>std</b>   | 3.524049    | 4.301036     | 24.298981      | 351.914129  | 0.014064        | 0.052813         | 0.079720       | 0.038803            |
| <b>min</b>   | 6.981000    | 9.710000     | 43.790000      | 143.500000  | 0.052630        | 0.019380         | 0.000000       | 0.000000            |
| <b>25%</b>   | 11.700000   | 16.170000    | 75.170000      | 420.300000  | 0.086370        | 0.064920         | 0.029560       | 0.020310            |
| <b>50%</b>   | 13.370000   | 18.840000    | 86.240000      | 551.100000  | 0.095870        | 0.092630         | 0.061540       | 0.033500            |
| <b>75%</b>   | 15.780000   | 21.800000    | 104.100000     | 782.700000  | 0.105300        | 0.130400         | 0.130700       | 0.074000            |
| <b>max</b>   | 28.110000   | 39.280000    | 188.500000     | 2501.000000 | 0.163400        | 0.345400         | 0.426800       | 0.201200            |







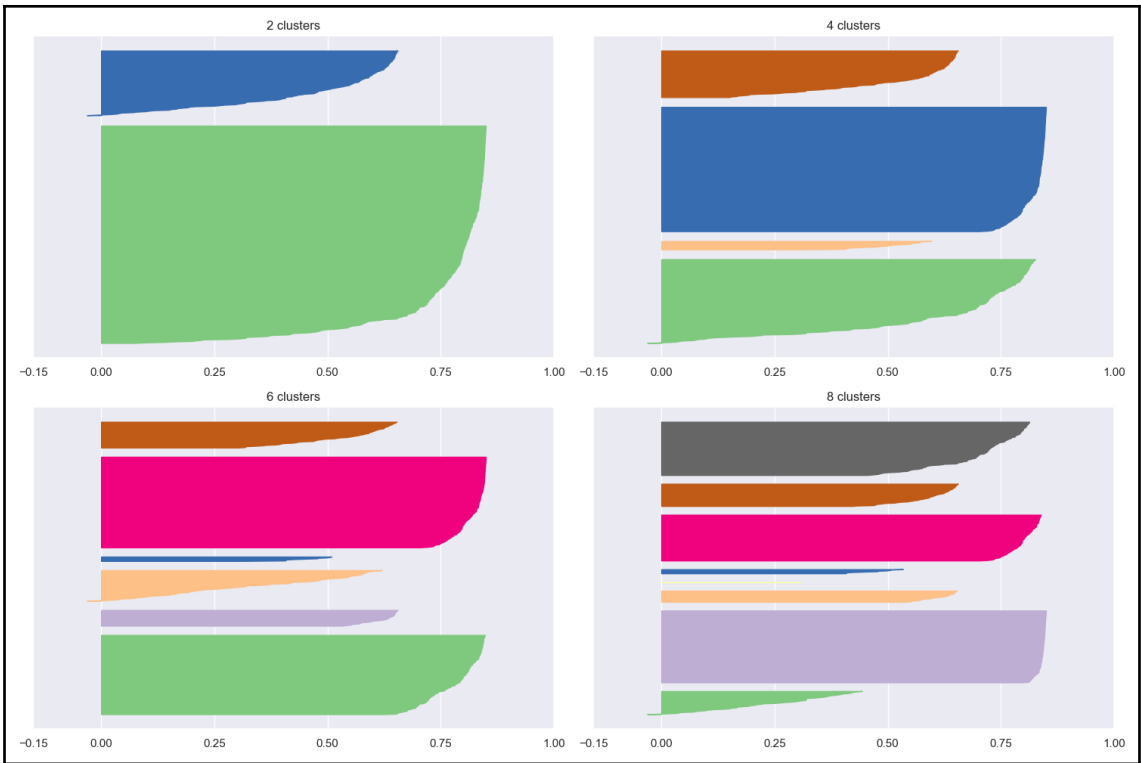


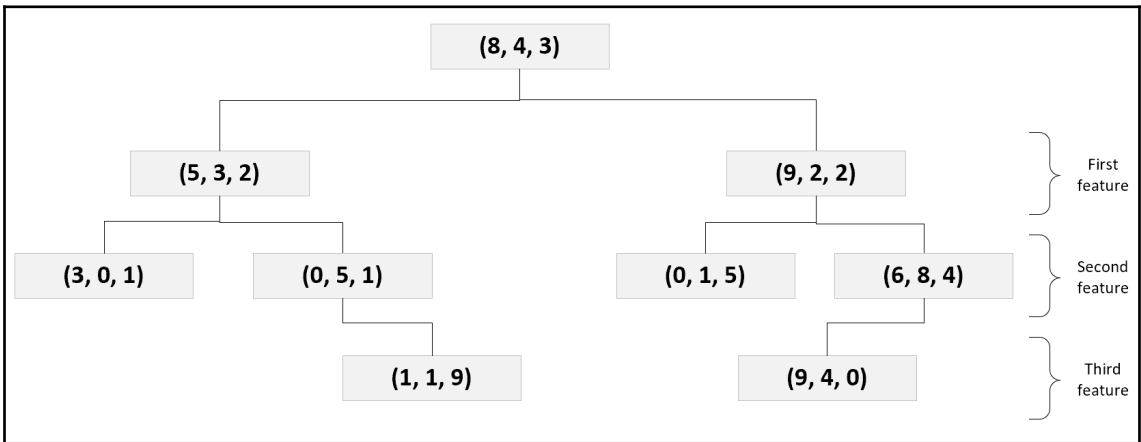
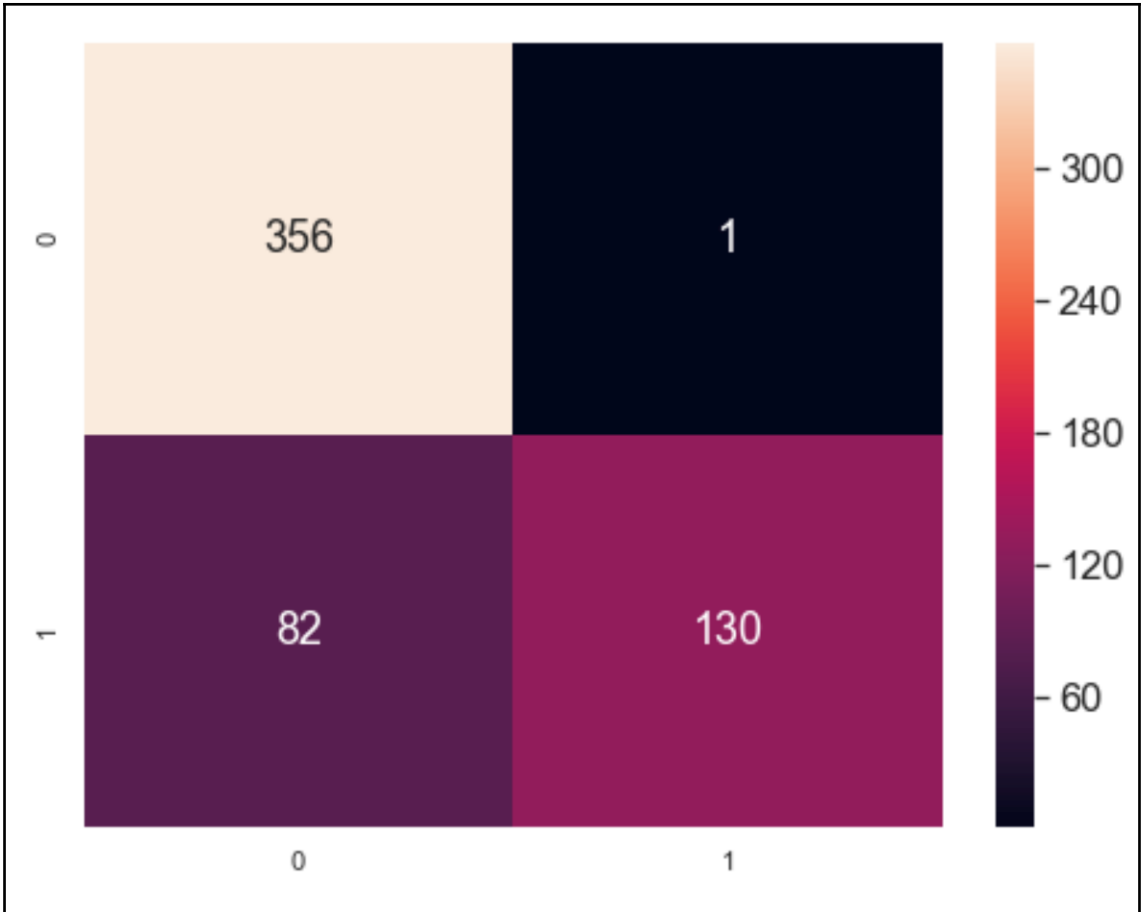


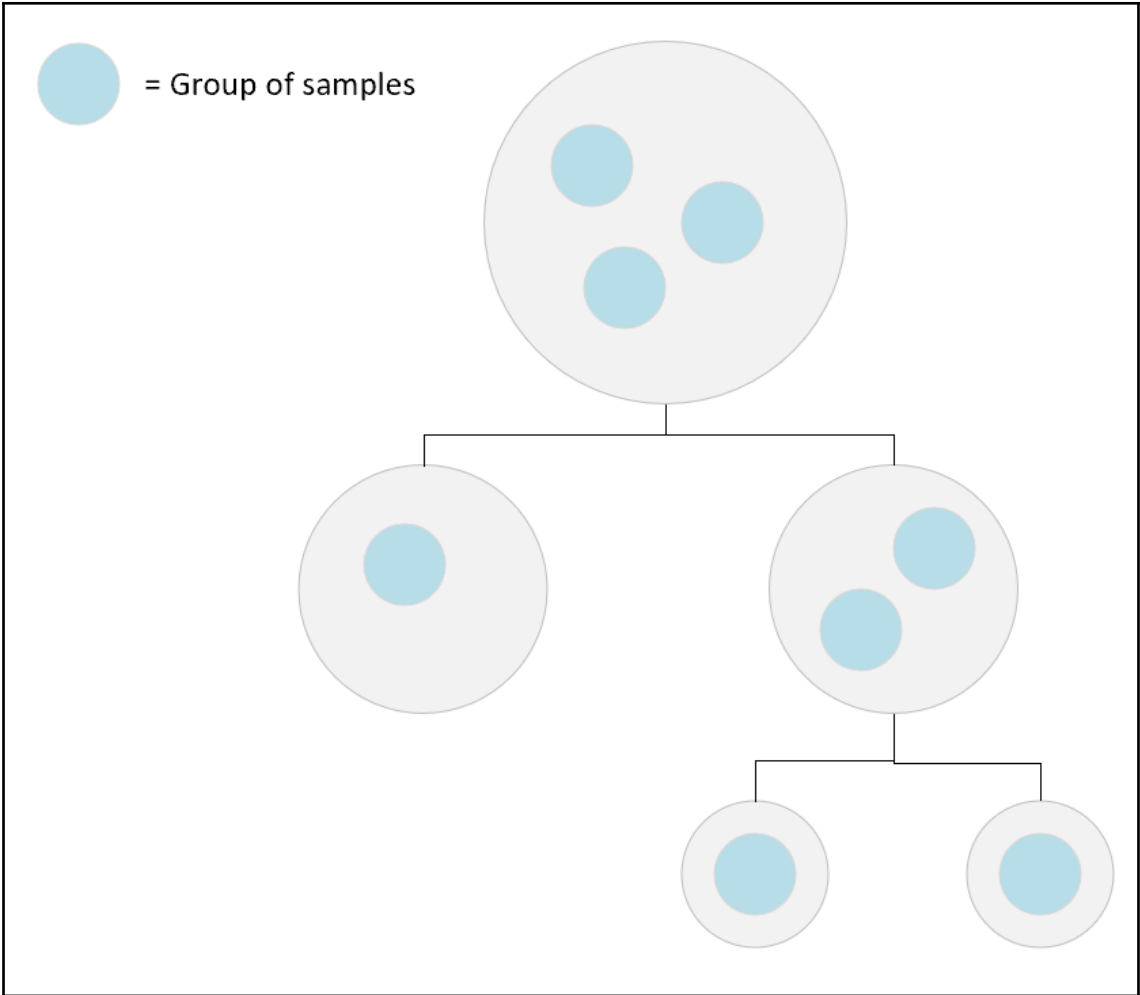


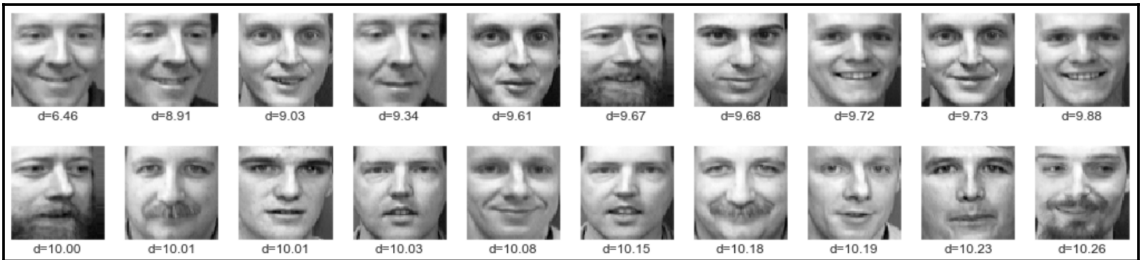
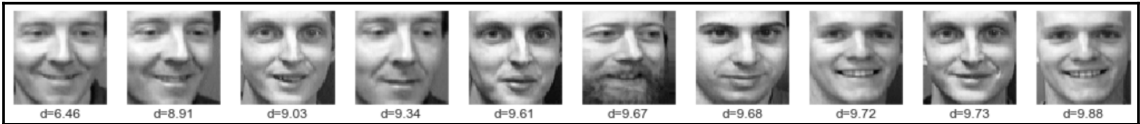
|              | <b>perimeter_mean</b> | <b>area_mean</b> | <b>smoothness_mean</b> | <b>concavity_mean</b> | <b>symmetry_mean</b> |
|--------------|-----------------------|------------------|------------------------|-----------------------|----------------------|
| <b>count</b> | 58.000000             | 58.000000        | 58.000000              | 58.000000             | 58.000000            |
| <b>mean</b>  | 129.822414            | 1199.527586      | 0.100231               | 0.176981              | 0.193281             |
| <b>std</b>   | 6.503630              | 98.030806        | 0.010427               | 0.063437              | 0.027702             |
| <b>min</b>   | 110.000000            | 904.600000       | 0.080200               | 0.086900              | 0.142800             |
| <b>25%</b>   | 125.675000            | 1138.000000      | 0.091568               | 0.134600              | 0.176925             |
| <b>50%</b>   | 130.000000            | 1210.500000      | 0.100200               | 0.161000              | 0.189750             |
| <b>75%</b>   | 133.800000            | 1271.750000      | 0.107600               | 0.212650              | 0.209100             |
| <b>max</b>   | 143.700000            | 1386.000000      | 0.128600               | 0.375400              | 0.290600             |

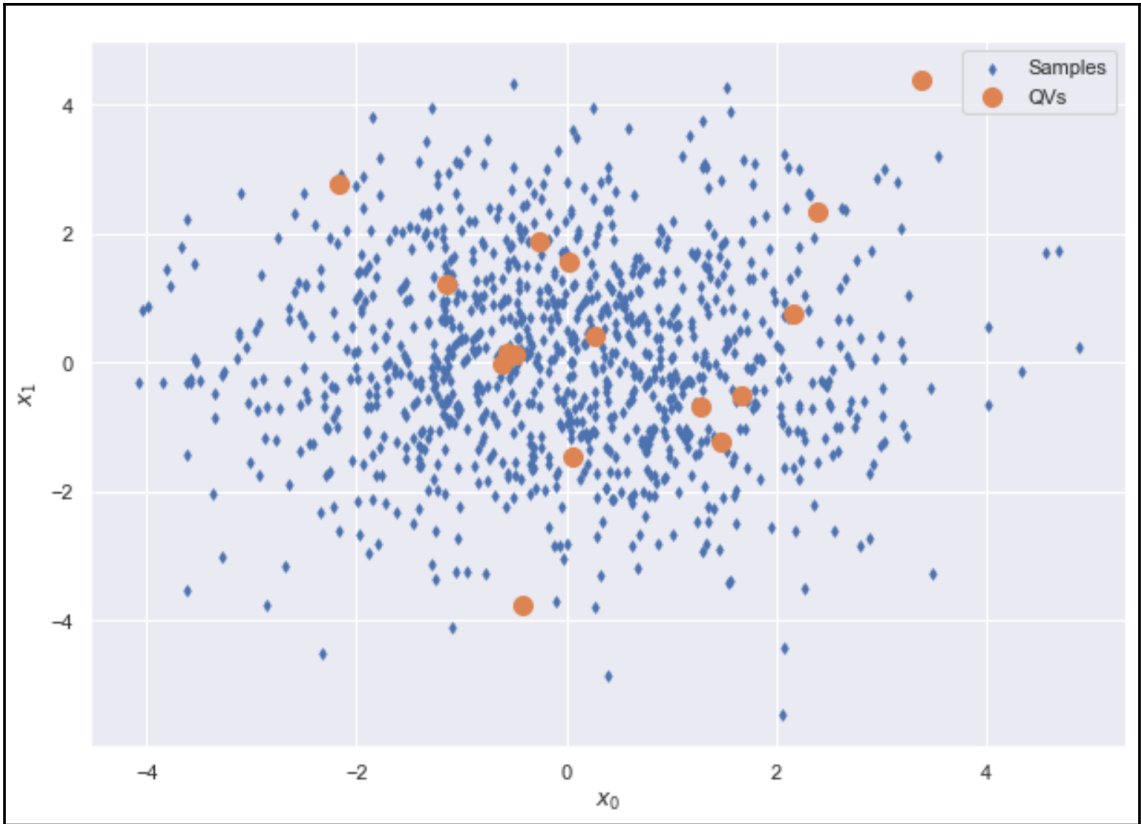
|              | <b>perimeter_mean</b> | <b>area_mean</b> | <b>smoothness_mean</b> | <b>concavity_mean</b> | <b>symmetry_mean</b> |
|--------------|-----------------------|------------------|------------------------|-----------------------|----------------------|
| <b>count</b> | 114.000000            | 114.000000       | 114.000000             | 114.000000            | 114.000000           |
| <b>mean</b>  | 64.997719             | 318.138596       | 0.095768               | 0.044920              | 0.181869             |
| <b>std</b>   | 6.752474              | 62.522359        | 0.014881               | 0.058654              | 0.029075             |
| <b>min</b>   | 43.790000             | 143.500000       | 0.052630               | 0.000000              | 0.106000             |
| <b>25%</b>   | 60.437500             | 275.075000       | 0.085127               | 0.012688              | 0.164000             |
| <b>50%</b>   | 65.800000             | 321.600000       | 0.096720               | 0.028290              | 0.179550             |
| <b>75%</b>   | 70.790000             | 373.075000       | 0.104275               | 0.056798              | 0.195175             |
| <b>max</b>   | 75.460000             | 409.100000       | 0.163400               | 0.410800              | 0.274300             |



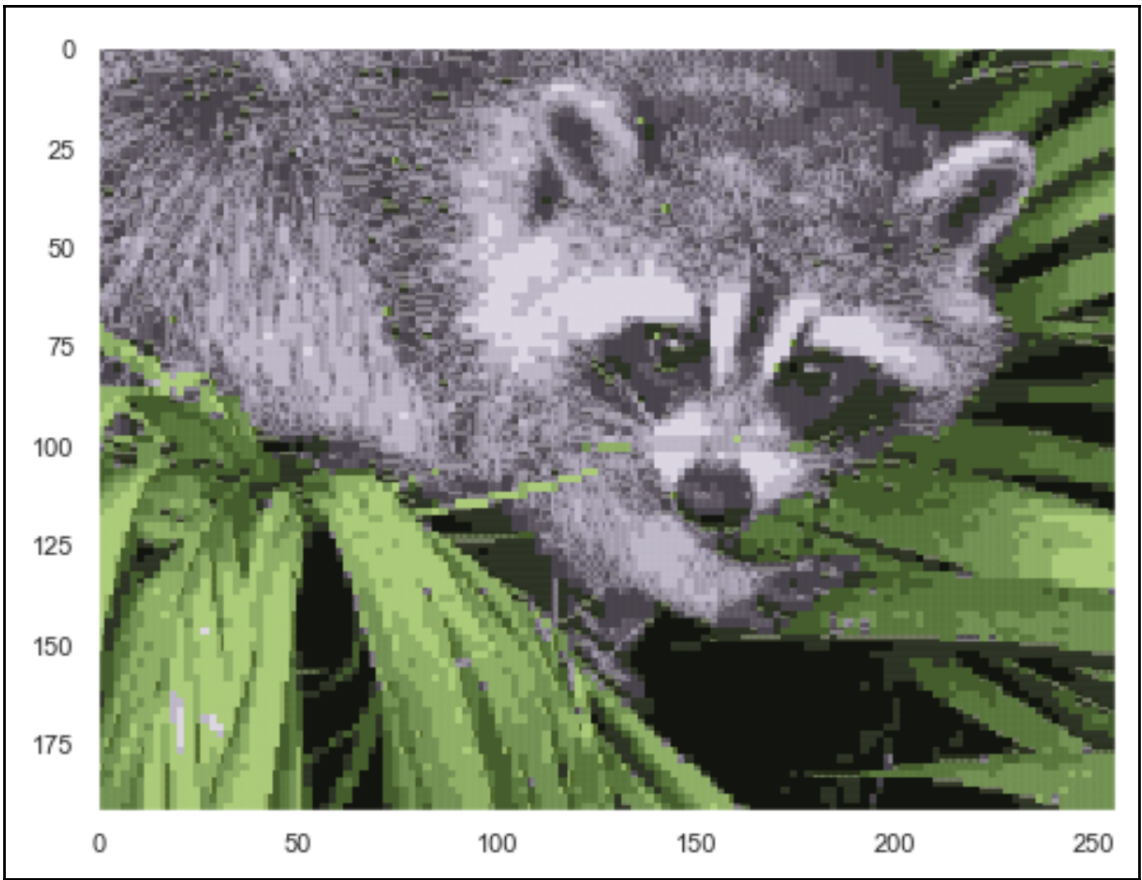




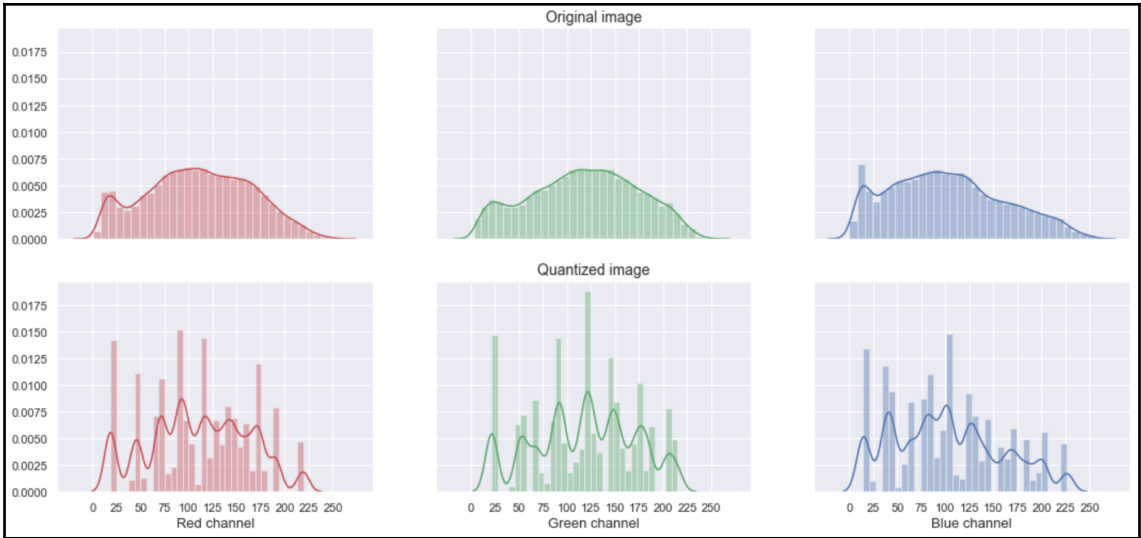






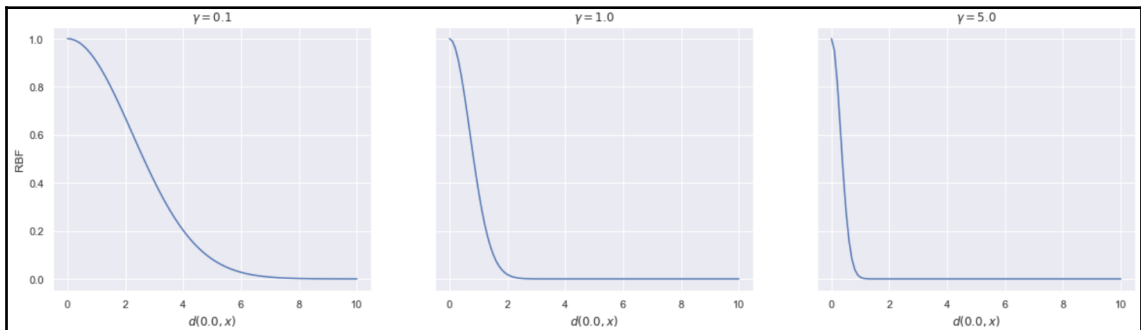
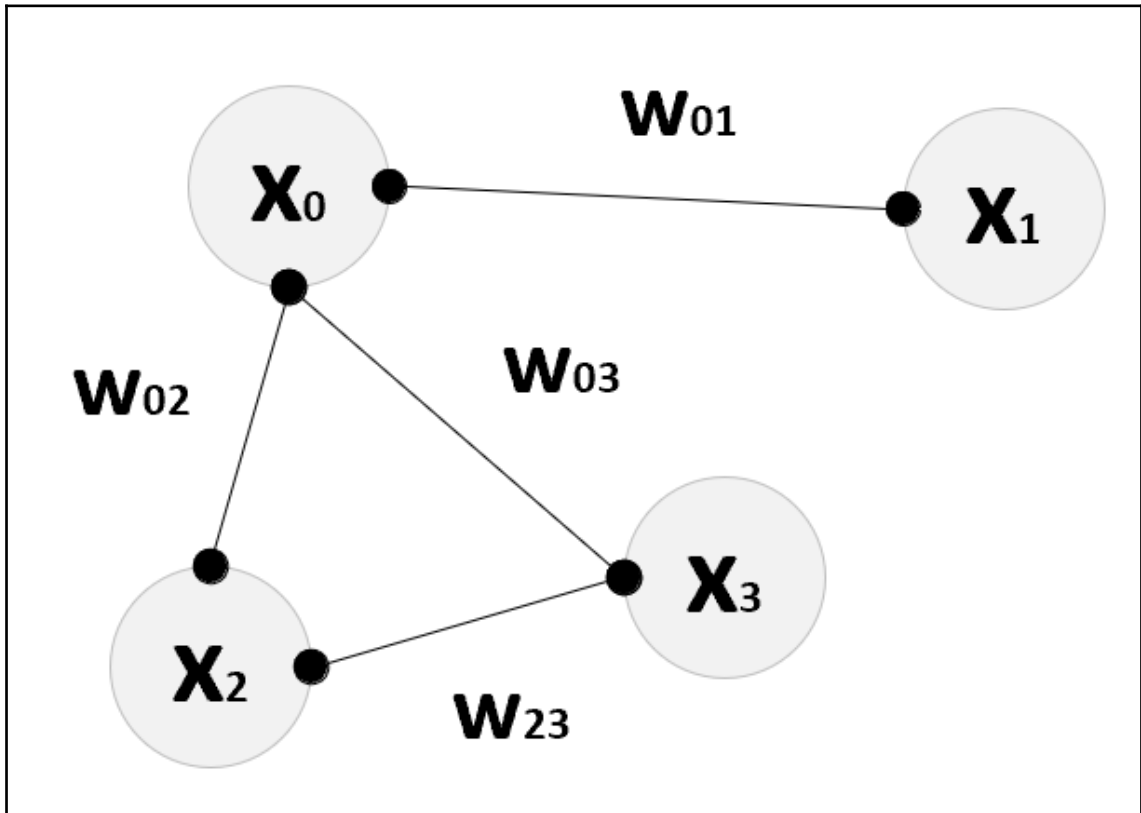


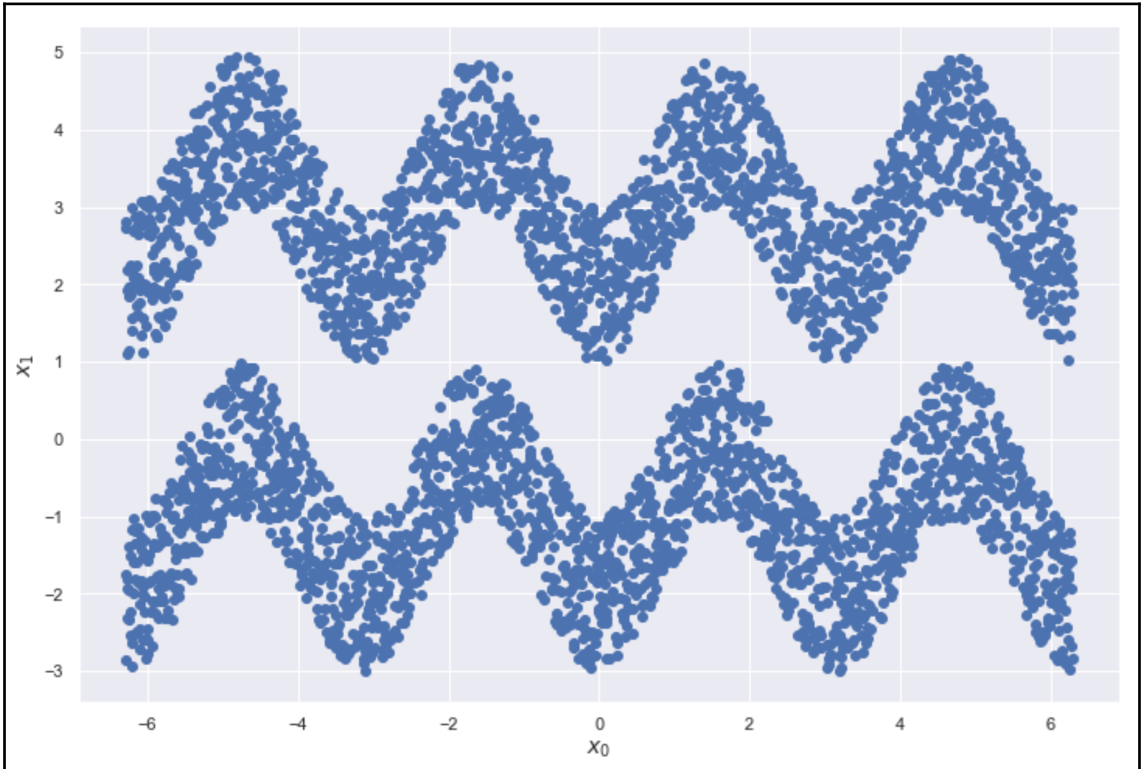
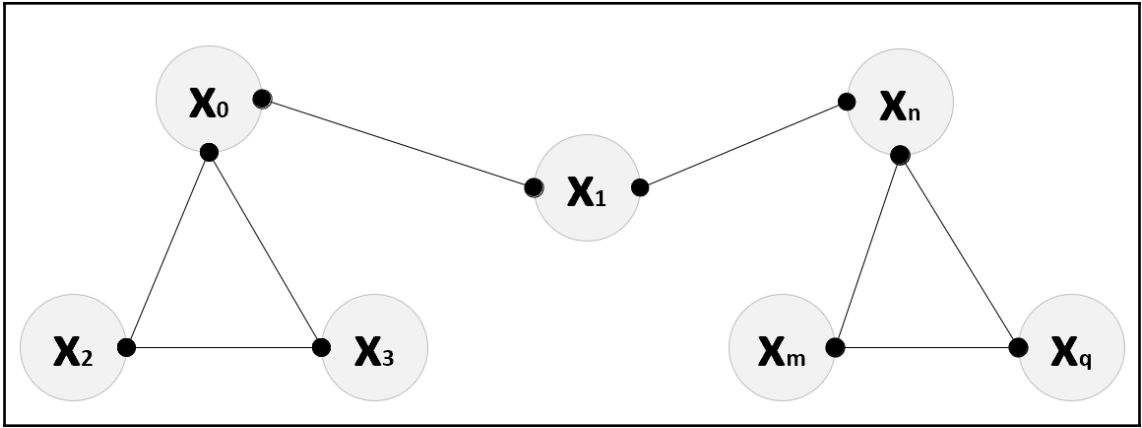


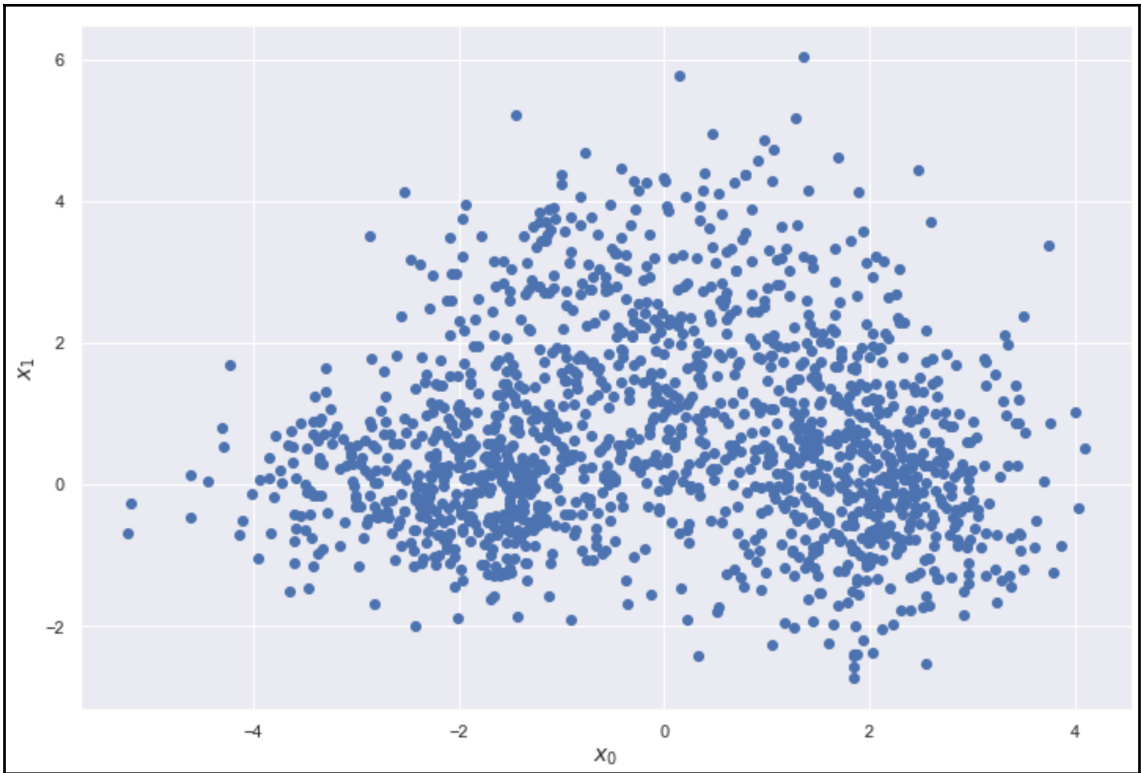
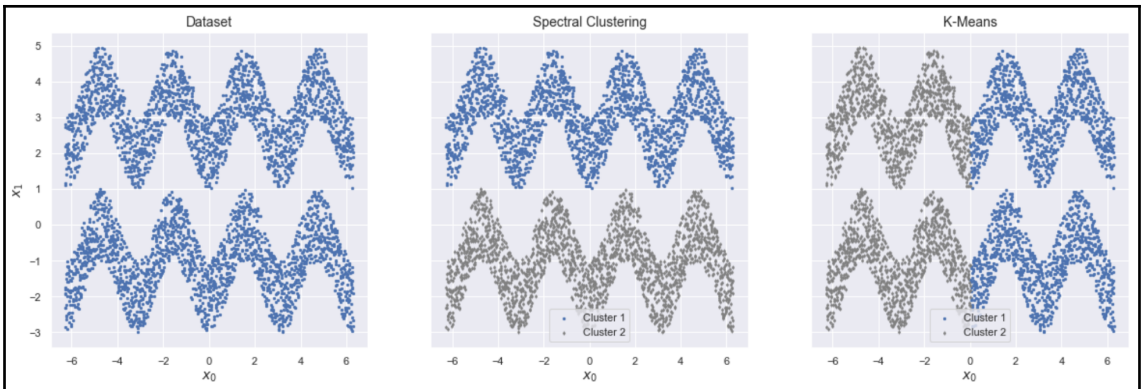


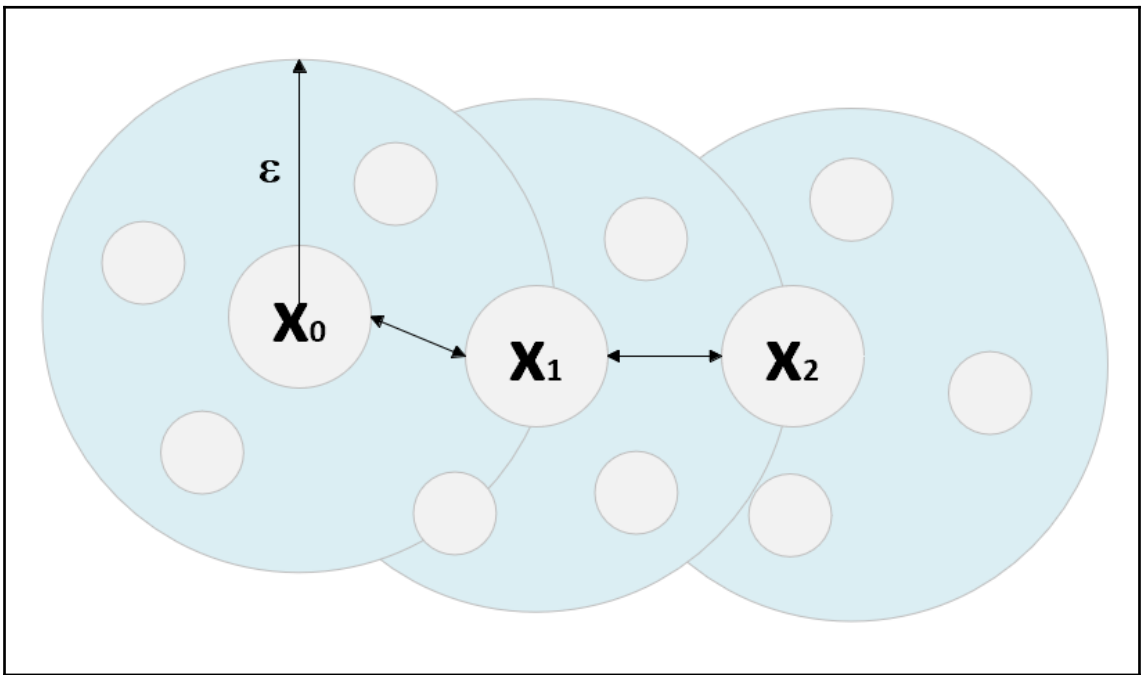
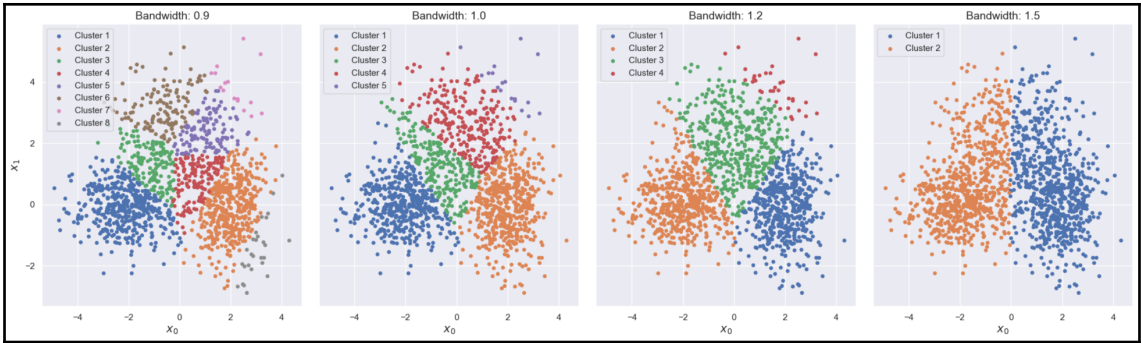
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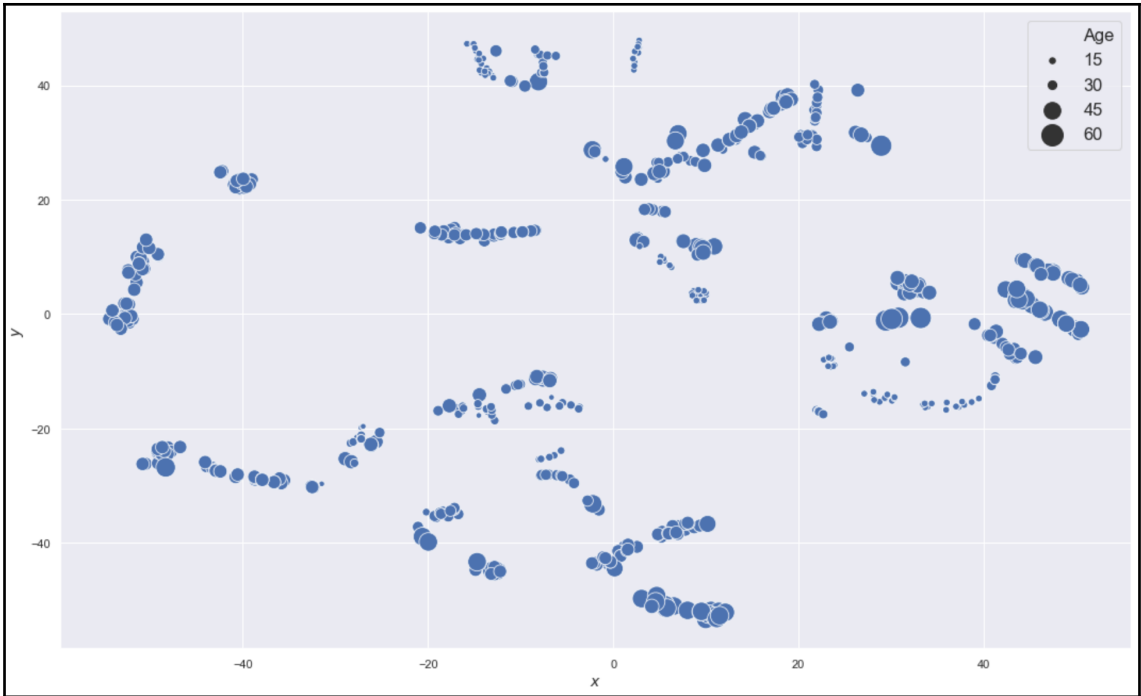
## Chapter 3: Advanced Clustering

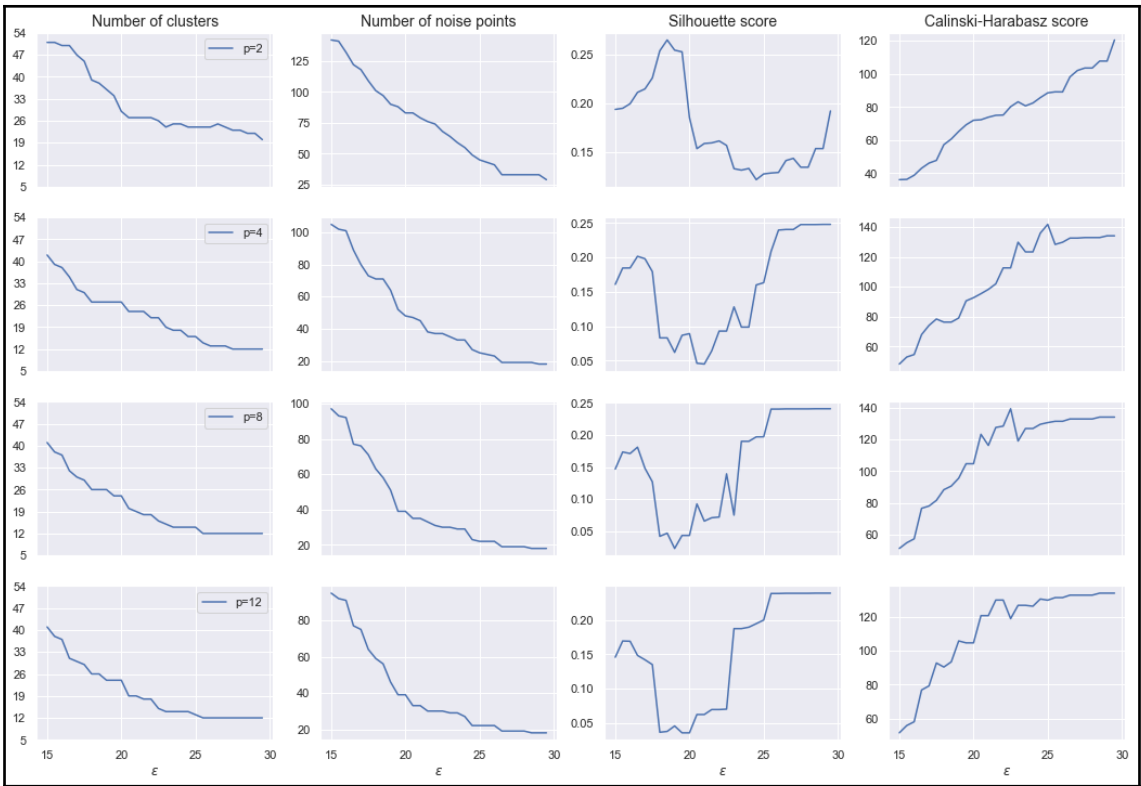


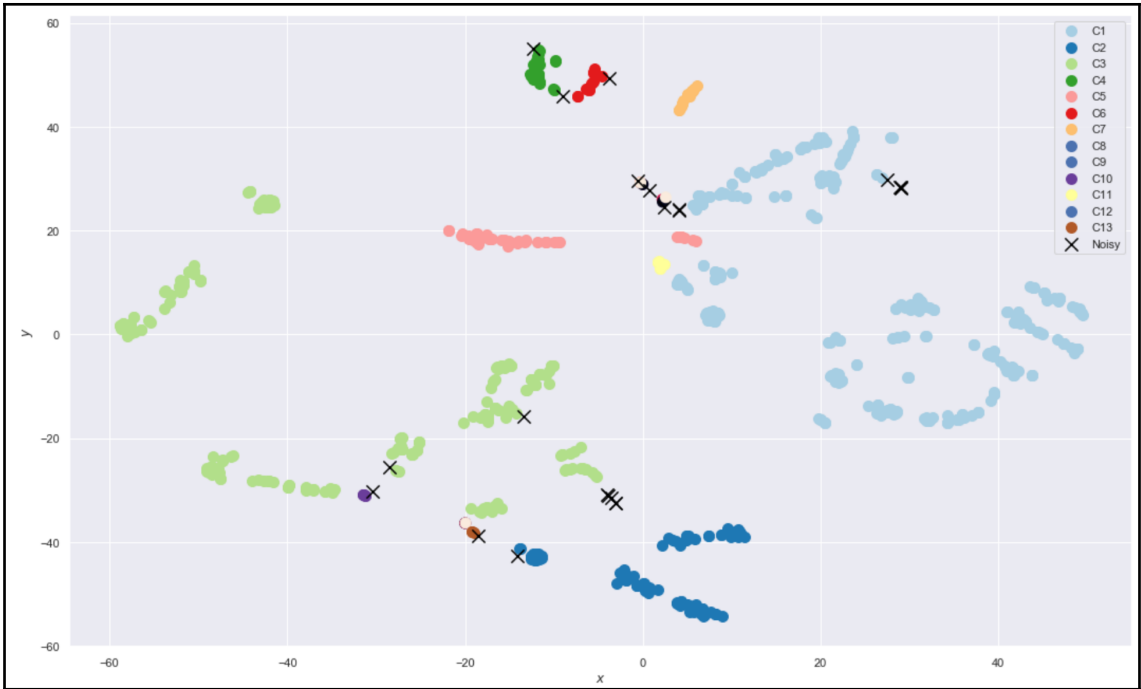








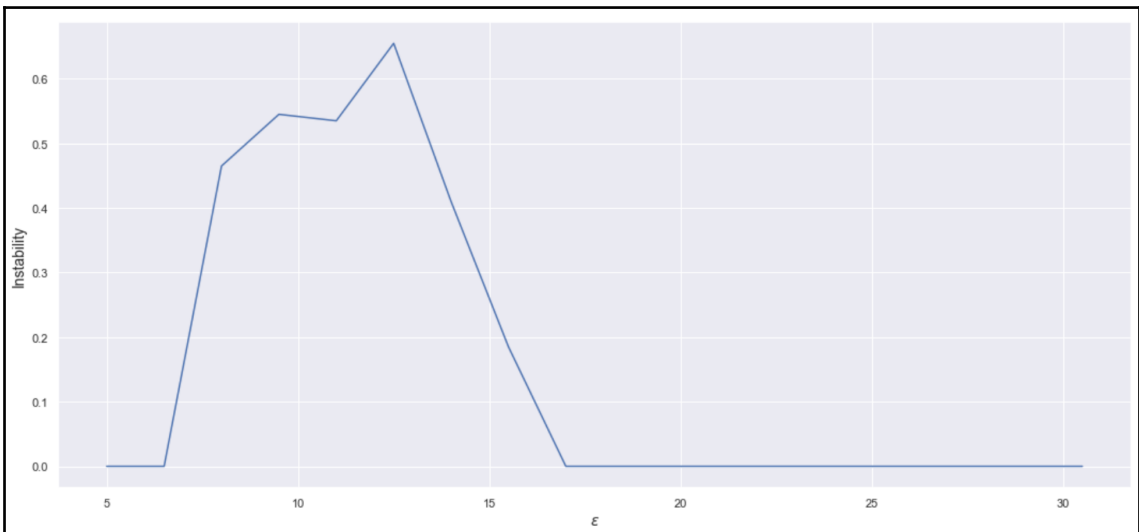


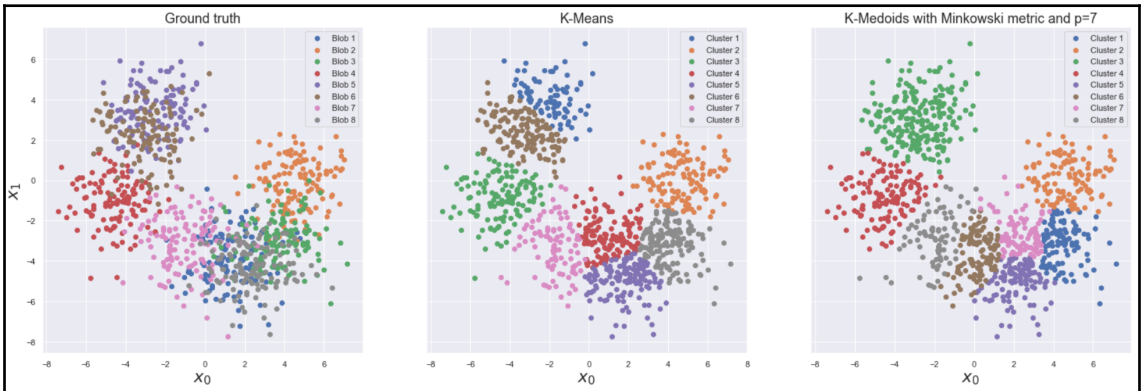
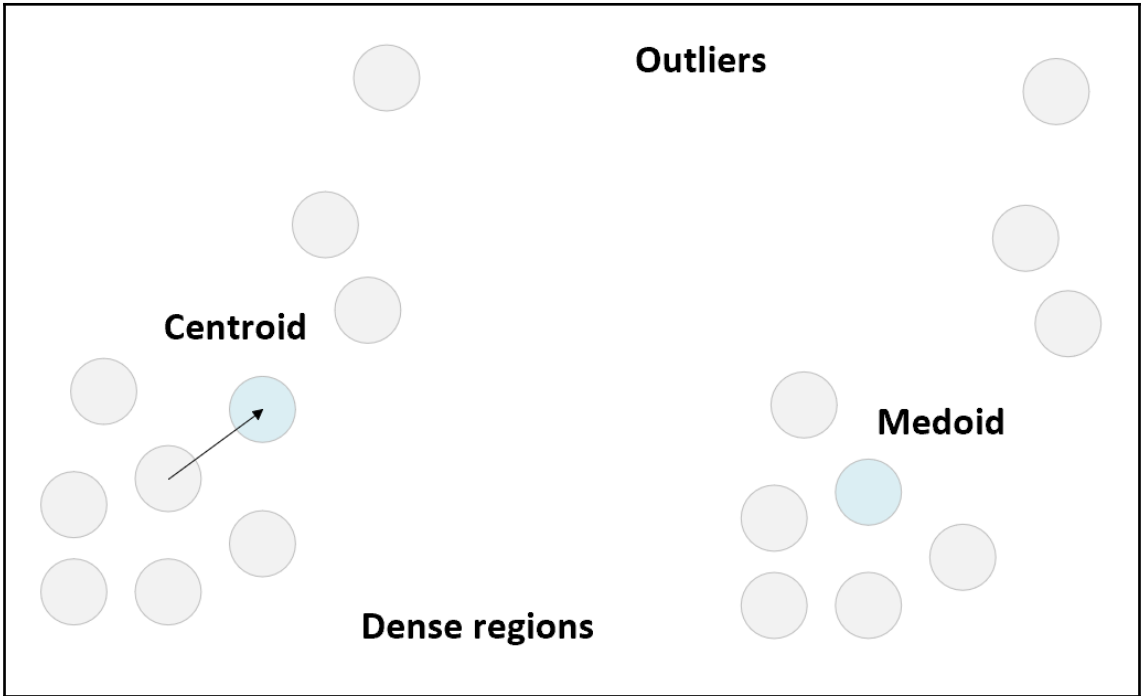


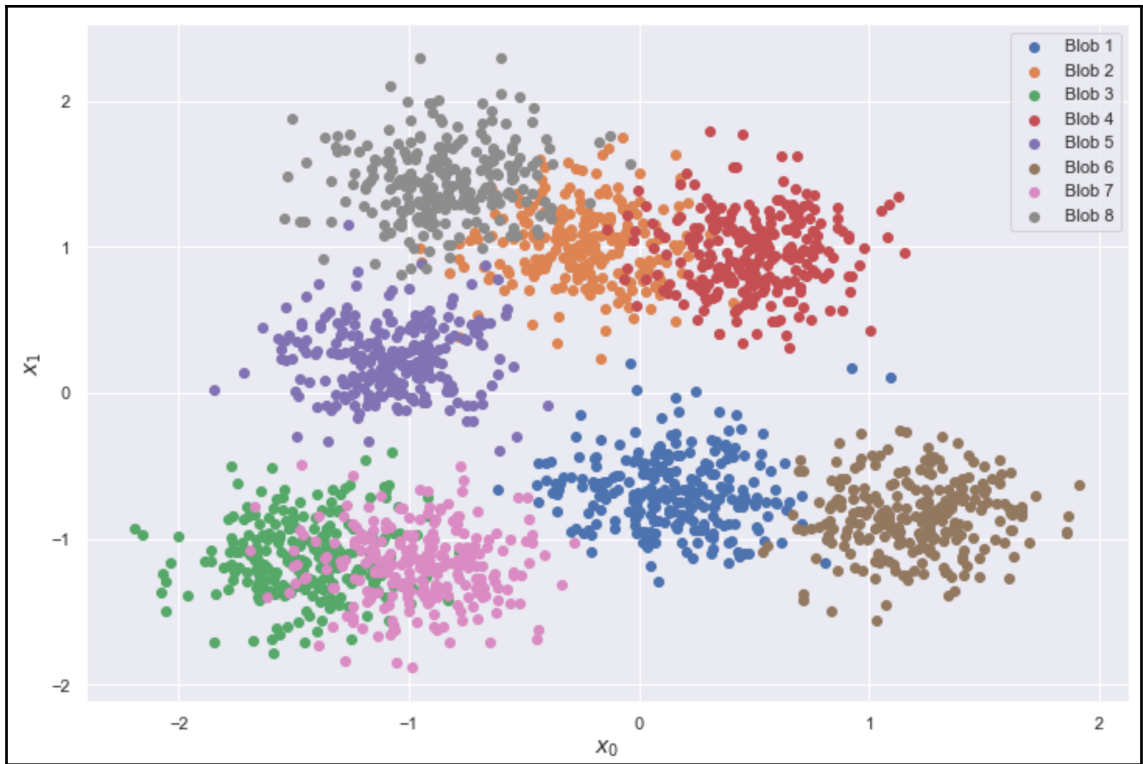
|              | Transportation expense | Distance from Residence to Work | Service time | Age       | Work load Average/day | Hit target | Son       | Pet       | Weight    | Height     |
|--------------|------------------------|---------------------------------|--------------|-----------|-----------------------|------------|-----------|-----------|-----------|------------|
| <b>count</b> | 67.0                   | 67.000000                       | 67.000000    | 67.000000 | 67.000000             | 67.000000  | 67.000000 | 67.000000 | 67.000000 | 67.000000  |
| <b>mean</b>  | 179.0                  | 50.910448                       | 17.940299    | 38.223881 | 251.817418            | 95.253731  | 0.014925  | 0.014925  | 88.820896 | 170.074627 |
| <b>std</b>   | 0.0                    | 0.733017                        | 0.488678     | 1.832542  | 10.791695             | 2.382660   | 0.122169  | 0.122169  | 1.466033  | 0.610847   |
| <b>min</b>   | 179.0                  | 45.000000                       | 14.000000    | 38.000000 | 230.290000            | 87.000000  | 0.000000  | 0.000000  | 77.000000 | 170.000000 |
| <b>25%</b>   | 179.0                  | 51.000000                       | 18.000000    | 38.000000 | 241.476000            | 93.000000  | 0.000000  | 0.000000  | 89.000000 | 170.000000 |
| <b>50%</b>   | 179.0                  | 51.000000                       | 18.000000    | 38.000000 | 251.818000            | 96.000000  | 0.000000  | 0.000000  | 89.000000 | 170.000000 |
| <b>75%</b>   | 179.0                  | 51.000000                       | 18.000000    | 38.000000 | 264.249000            | 97.000000  | 0.000000  | 0.000000  | 89.000000 | 170.000000 |
| <b>max</b>   | 179.0                  | 51.000000                       | 18.000000    | 53.000000 | 271.219000            | 99.000000  | 1.000000  | 1.000000  | 89.000000 | 175.000000 |

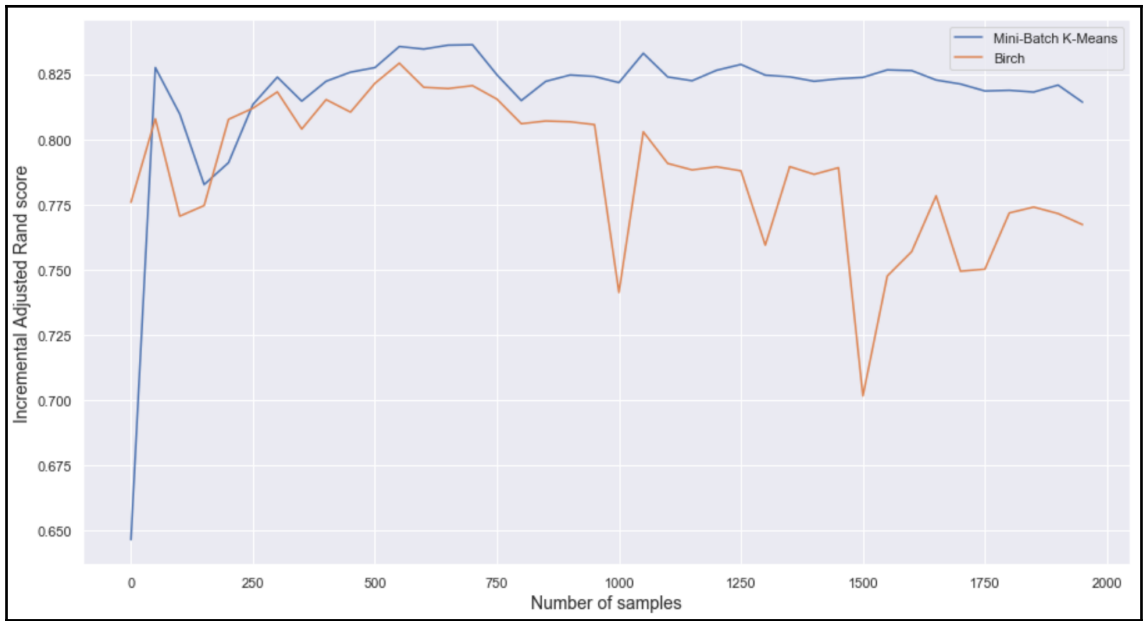


|              | Transportation expense | Distance from Residence to Work | Service time | Age        | Work load Average/day | Hit target | Son        | Pet        | Weight     | Height     |
|--------------|------------------------|---------------------------------|--------------|------------|-----------------------|------------|------------|------------|------------|------------|
| <b>count</b> | 165.000000             | 165.000000                      | 165.000000   | 165.000000 | 165.000000            | 165.000000 | 165.000000 | 165.000000 | 165.000000 | 165.000000 |
| <b>mean</b>  | 234.575758             | 23.212121                       | 11.818182    | 37.436364  | 256.334642            | 94.309091  | 0.987879   | 1.436364   | 78.842424  | 169.987879 |
| <b>std</b>   | 8.521244               | 8.129882                        | 3.616144     | 8.112991   | 20.949033             | 4.166677   | 0.634264   | 1.743598   | 13.169603  | 4.075489   |
| <b>min</b>   | 225.000000             | 11.000000                       | 1.000000     | 28.000000  | 205.917000            | 81.000000  | 0.000000   | 0.000000   | 65.000000  | 163.000000 |
| <b>25%</b>   | 225.000000             | 20.000000                       | 9.000000     | 28.000000  | 241.476000            | 92.000000  | 1.000000   | 0.000000   | 69.000000  | 167.000000 |
| <b>50%</b>   | 235.000000             | 25.000000                       | 13.000000    | 37.000000  | 261.306000            | 95.000000  | 1.000000   | 1.000000   | 69.000000  | 169.000000 |
| <b>75%</b>   | 246.000000             | 26.000000                       | 14.000000    | 43.000000  | 268.519000            | 98.000000  | 1.000000   | 2.000000   | 88.000000  | 172.000000 |
| <b>max</b>   | 248.000000             | 51.000000                       | 16.000000    | 58.000000  | 302.585000            | 99.000000  | 2.000000   | 8.000000   | 106.000000 | 182.000000 |



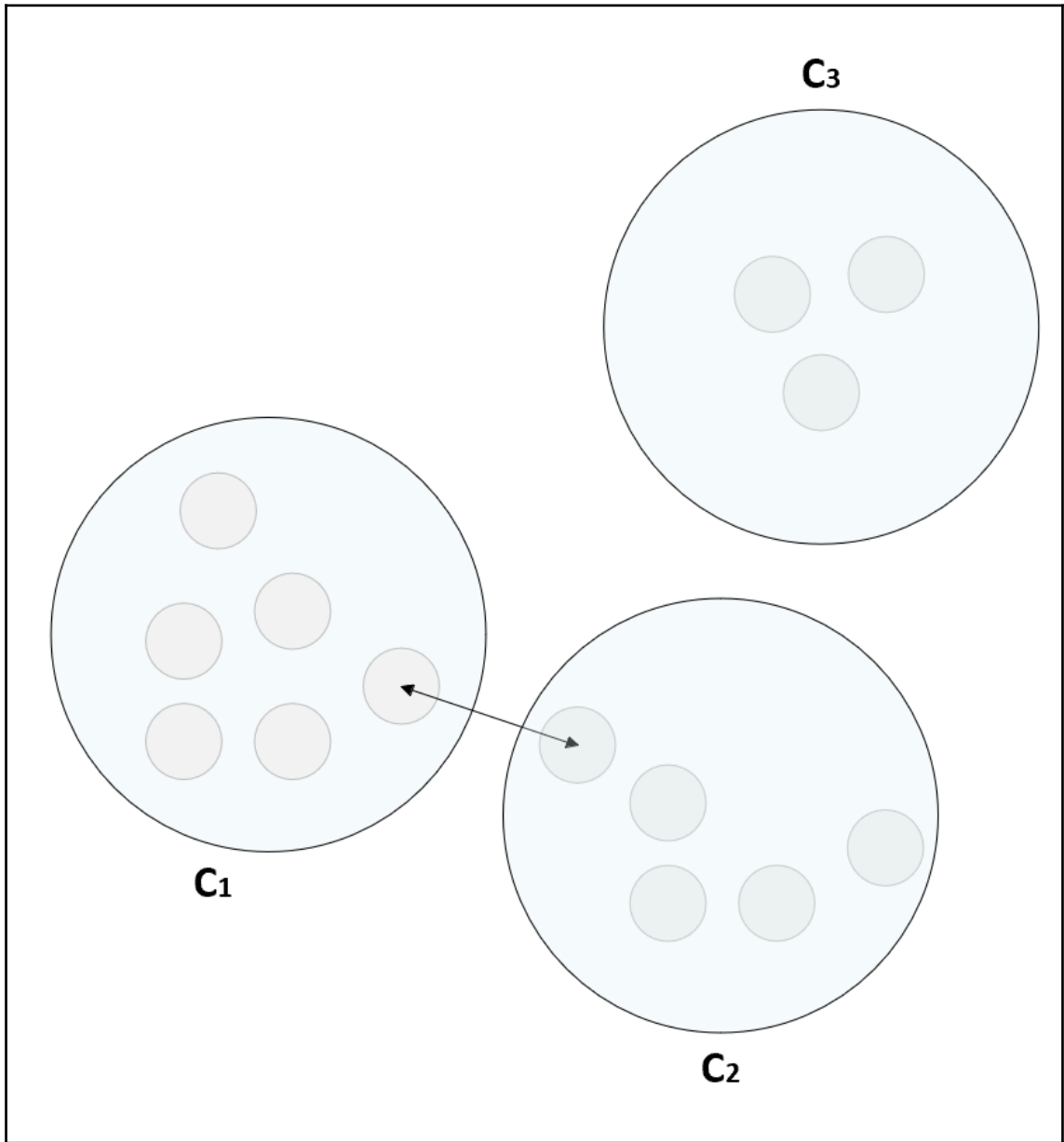


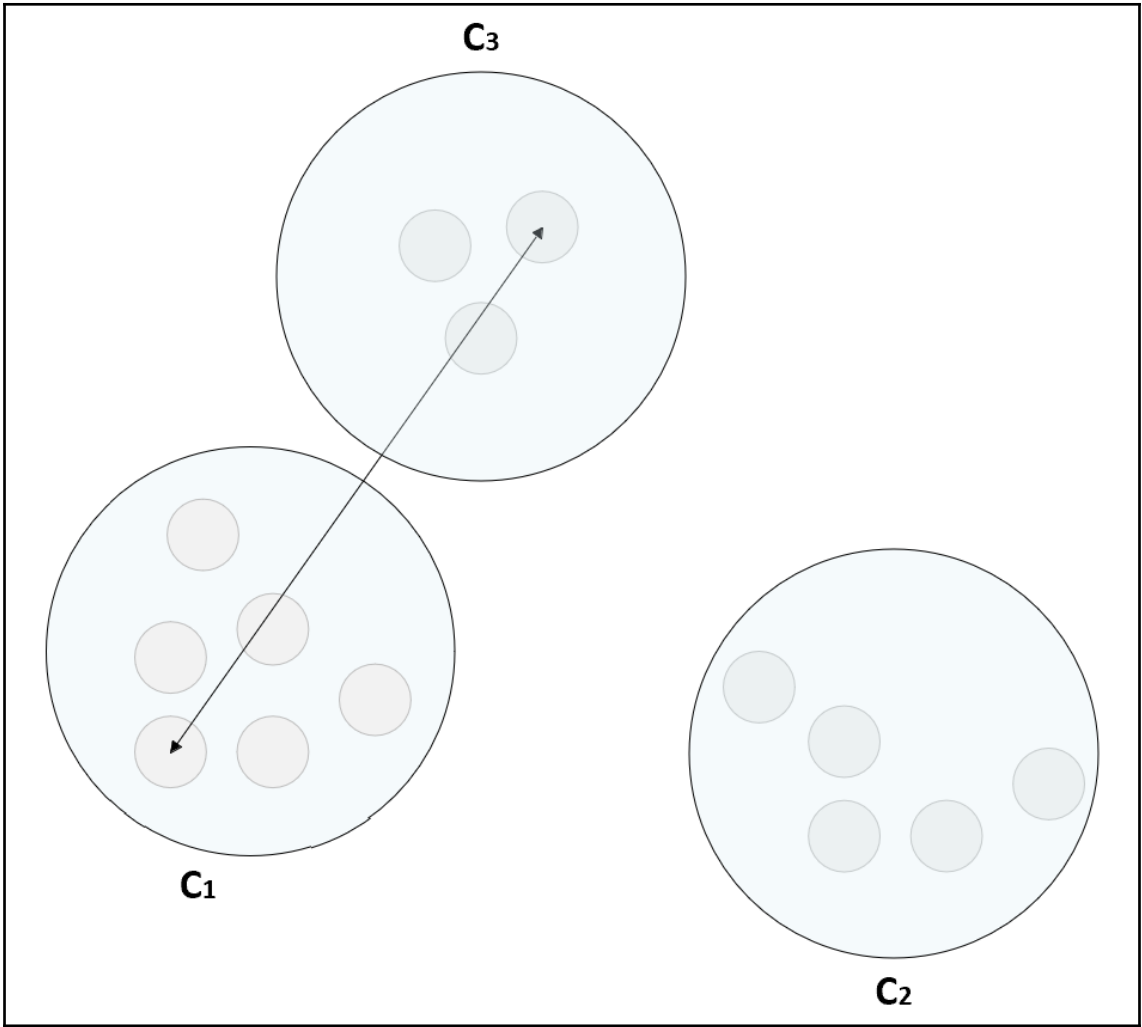


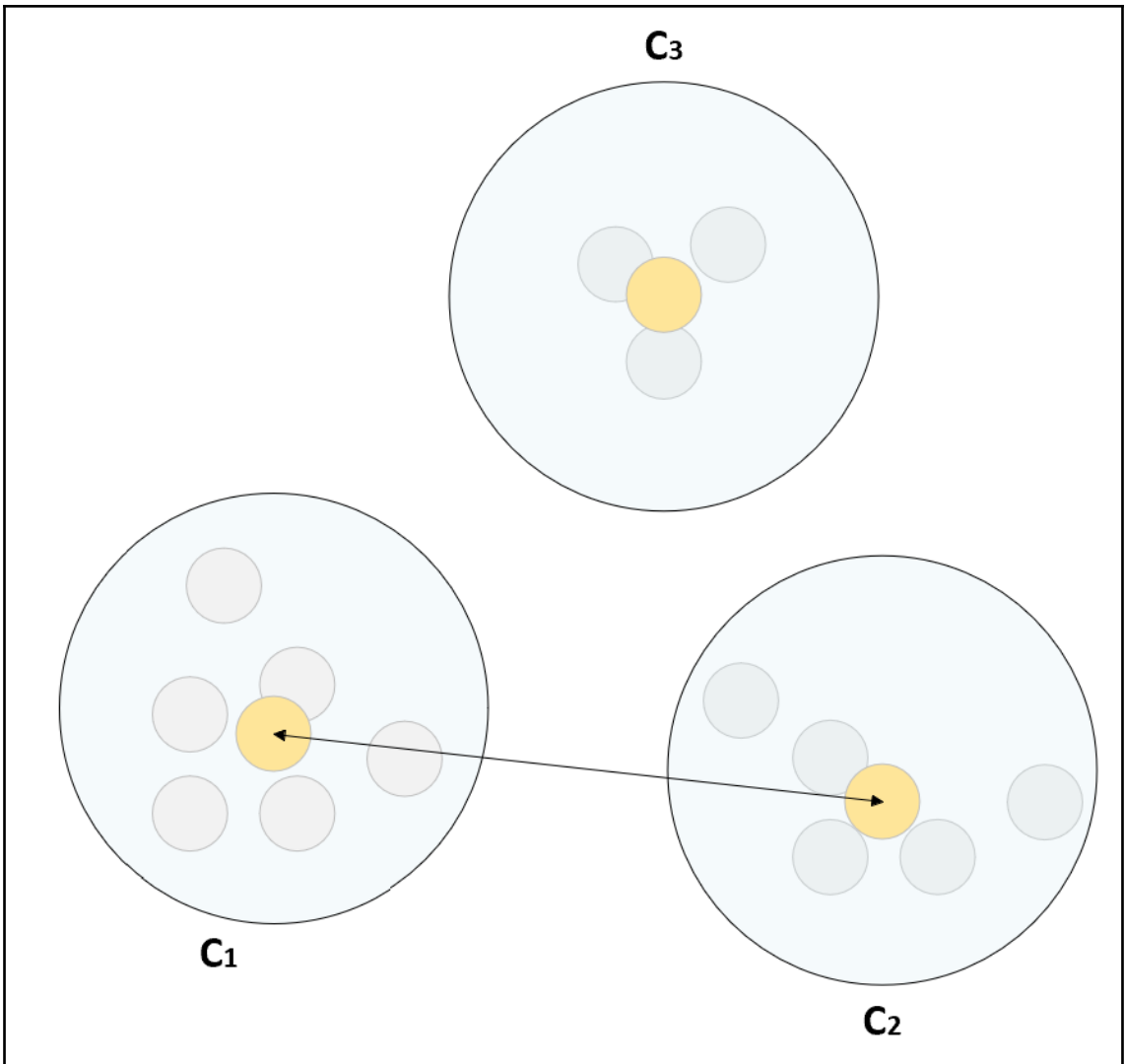


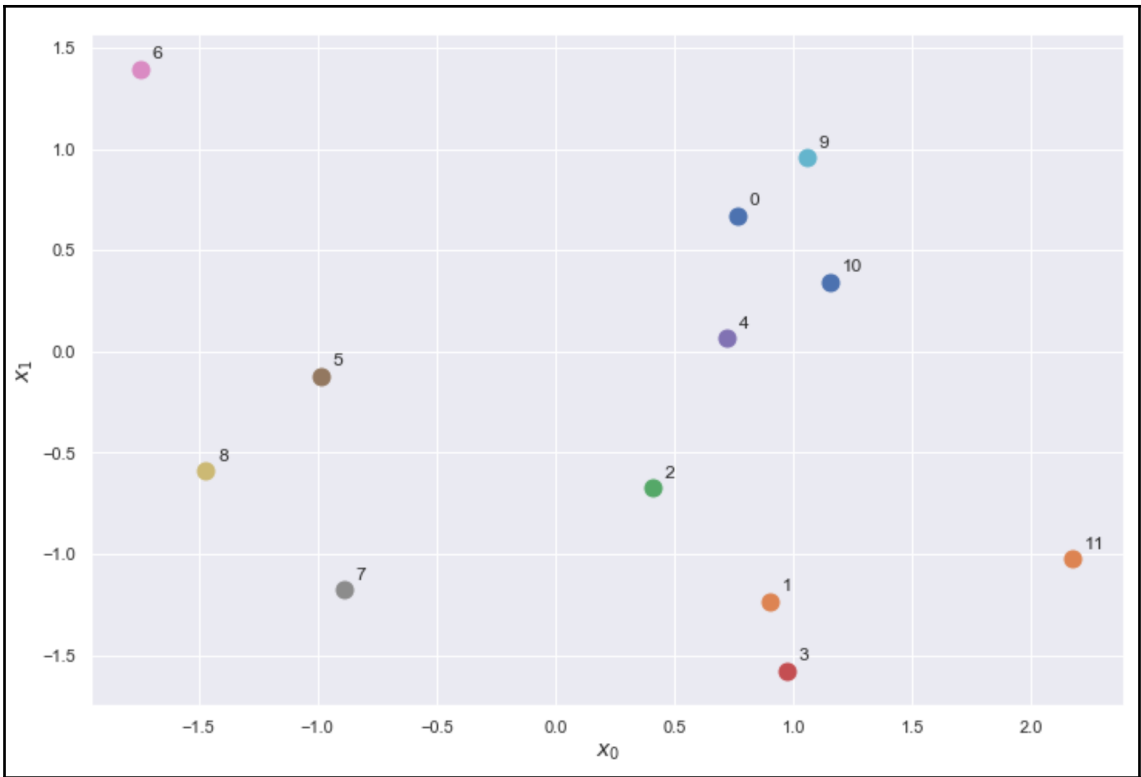
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## Chapter 4: Hierarchical Clustering in Action

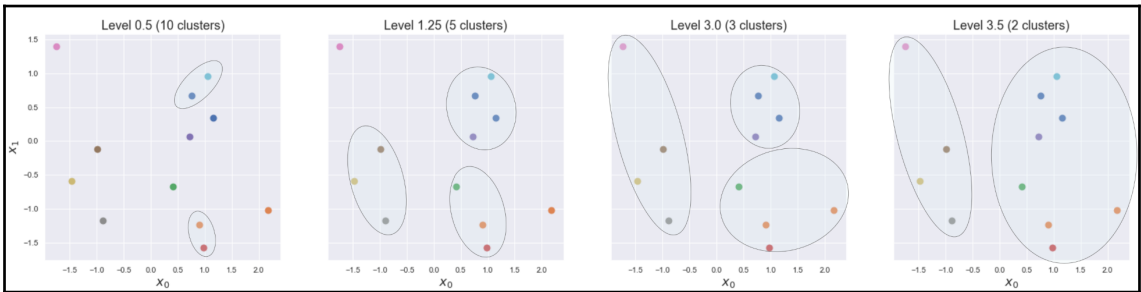
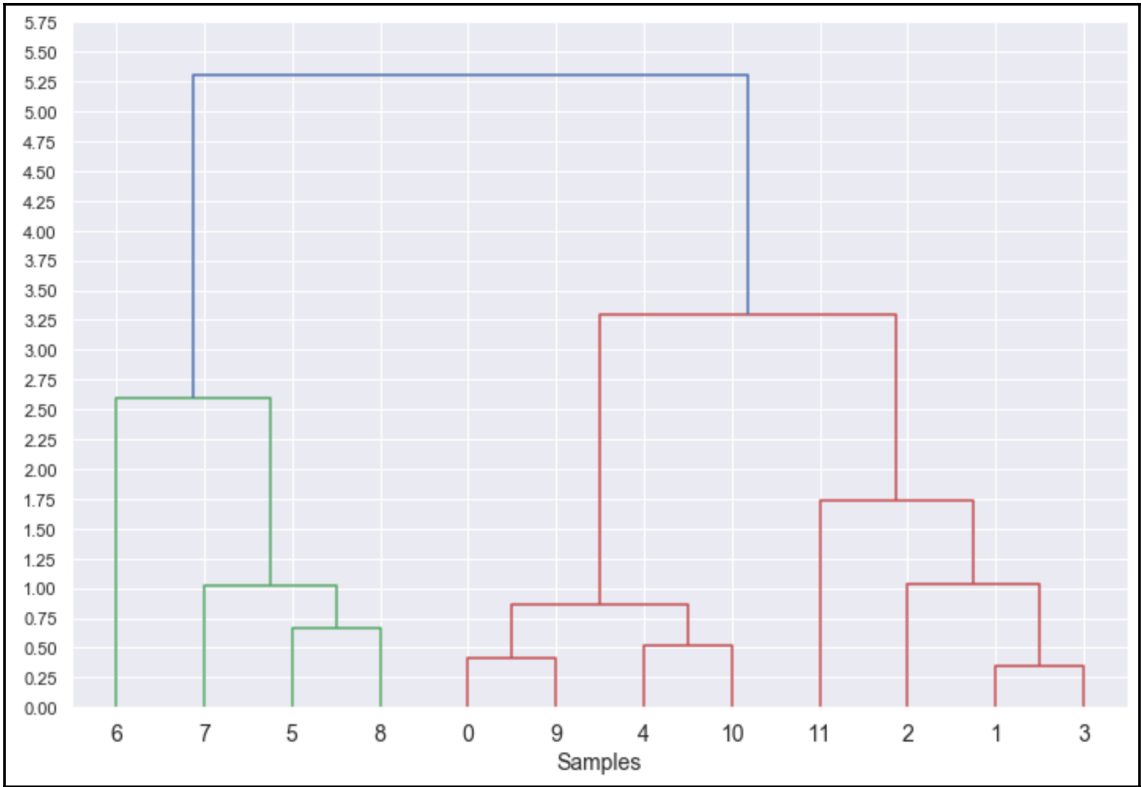


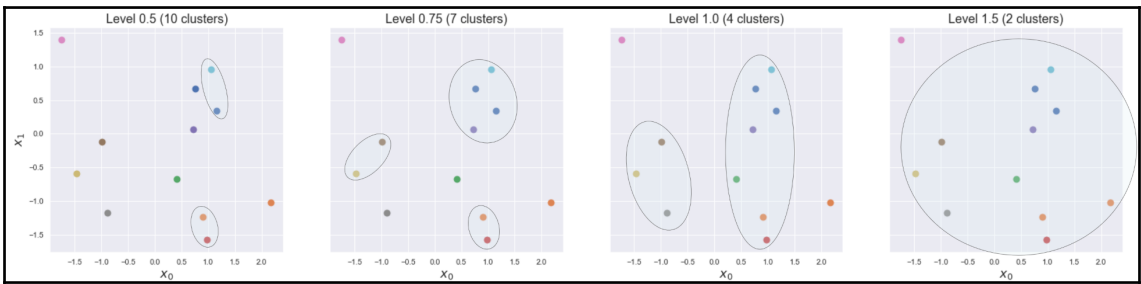
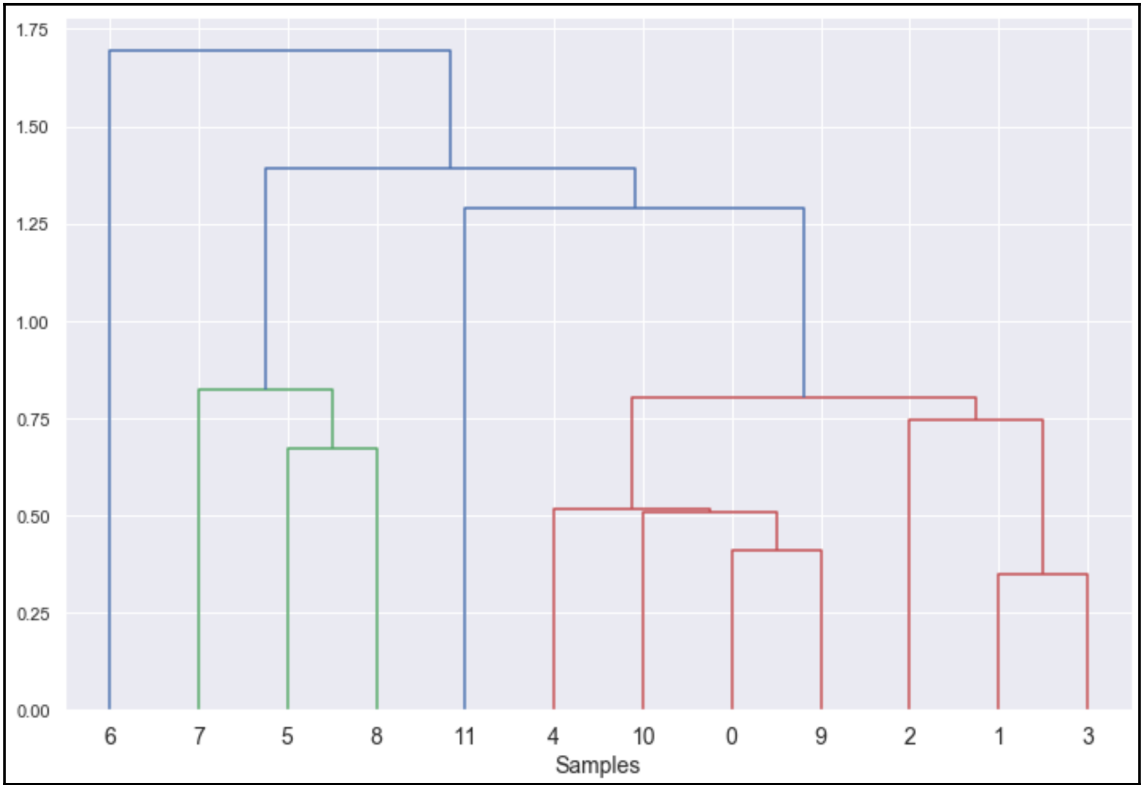


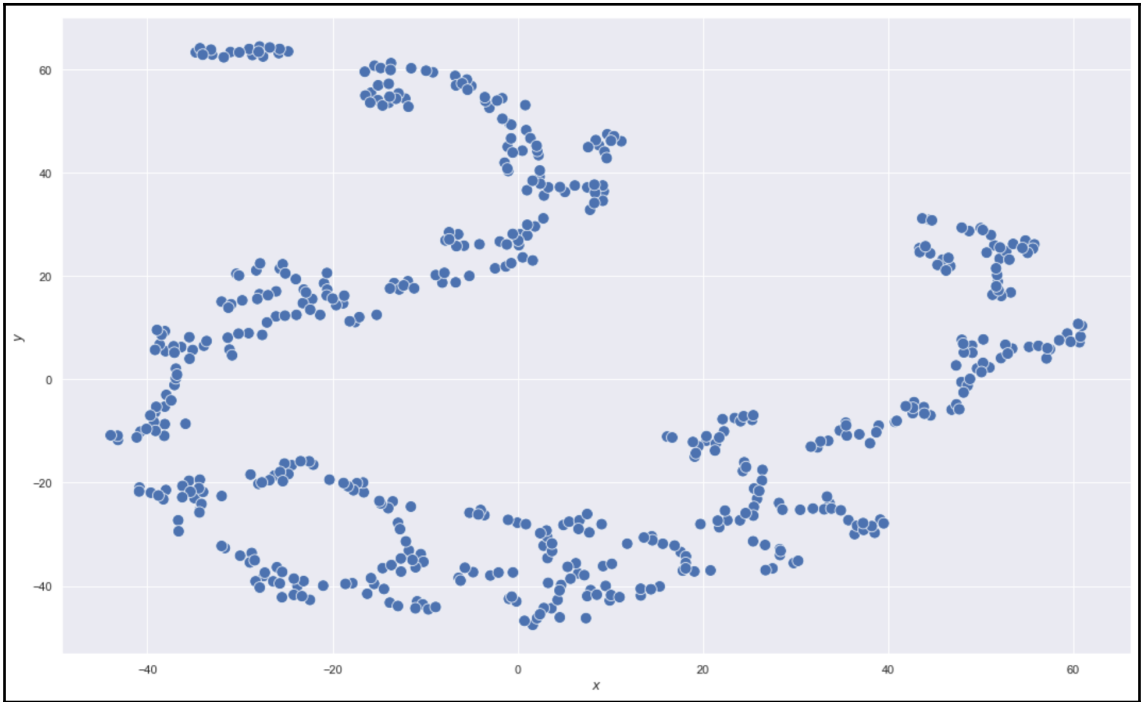


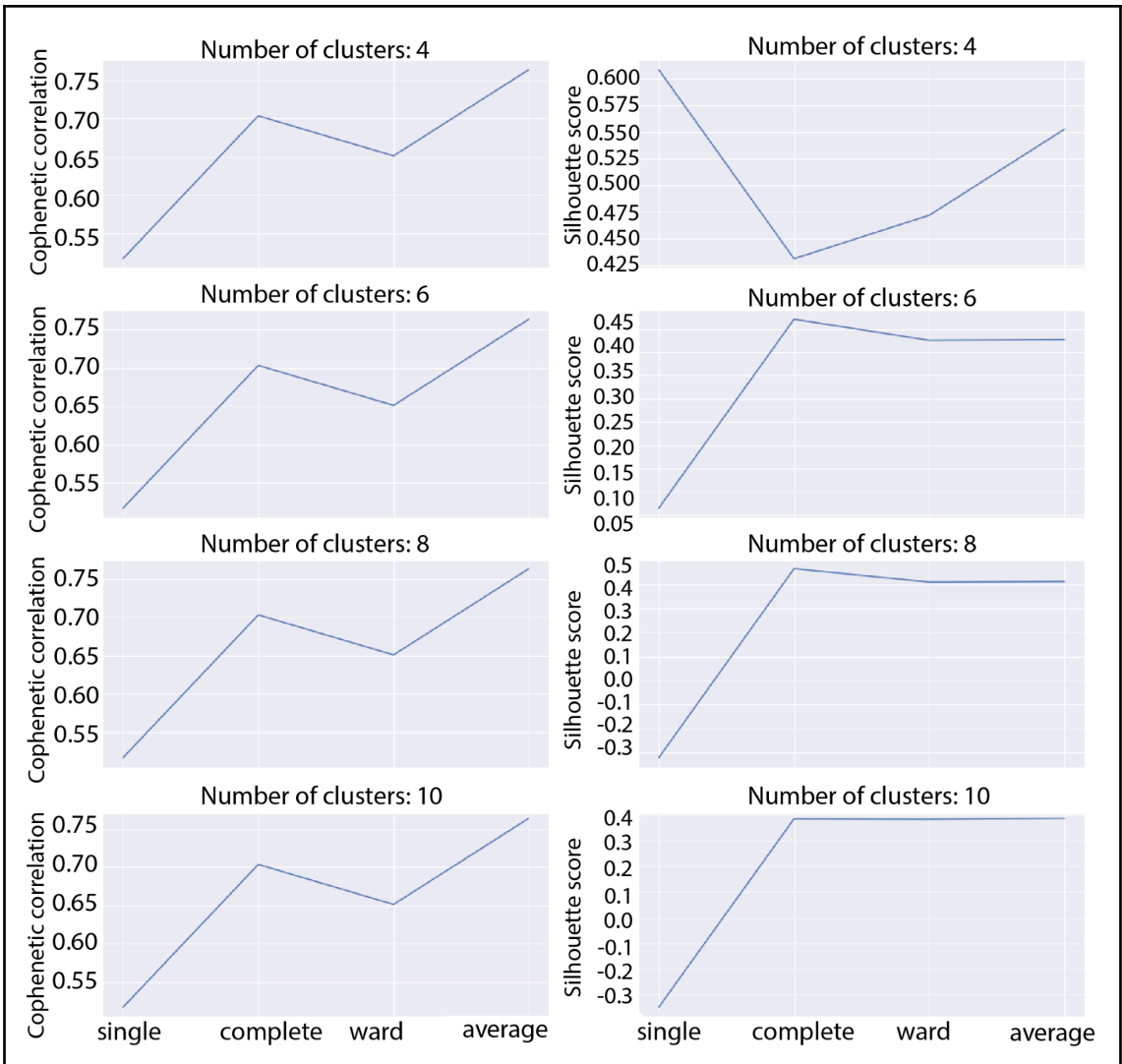


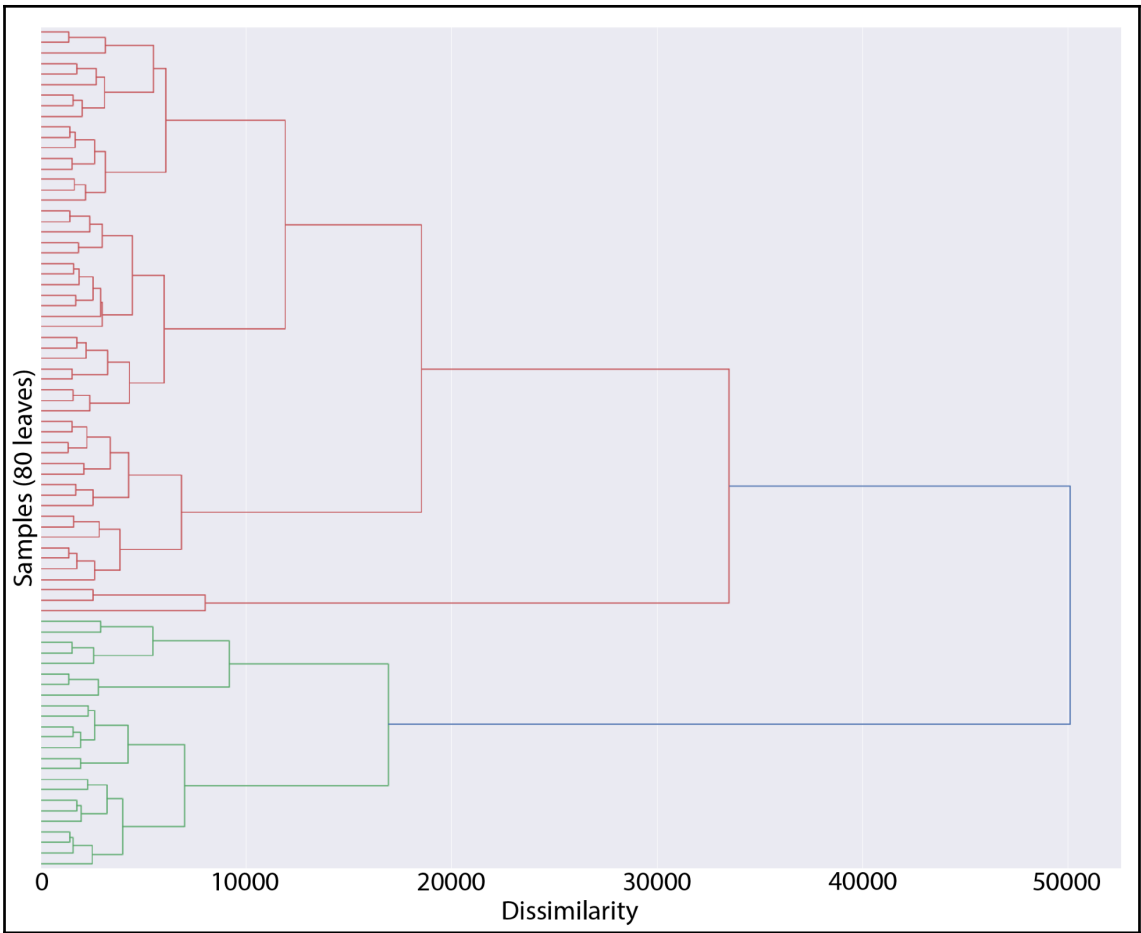


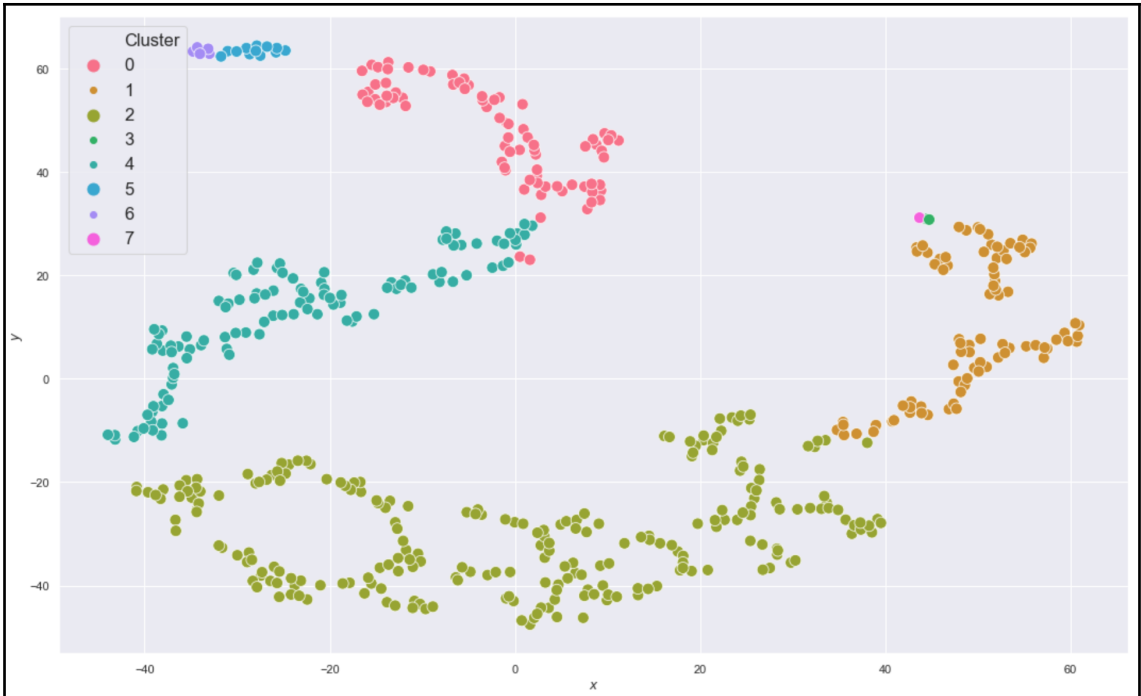


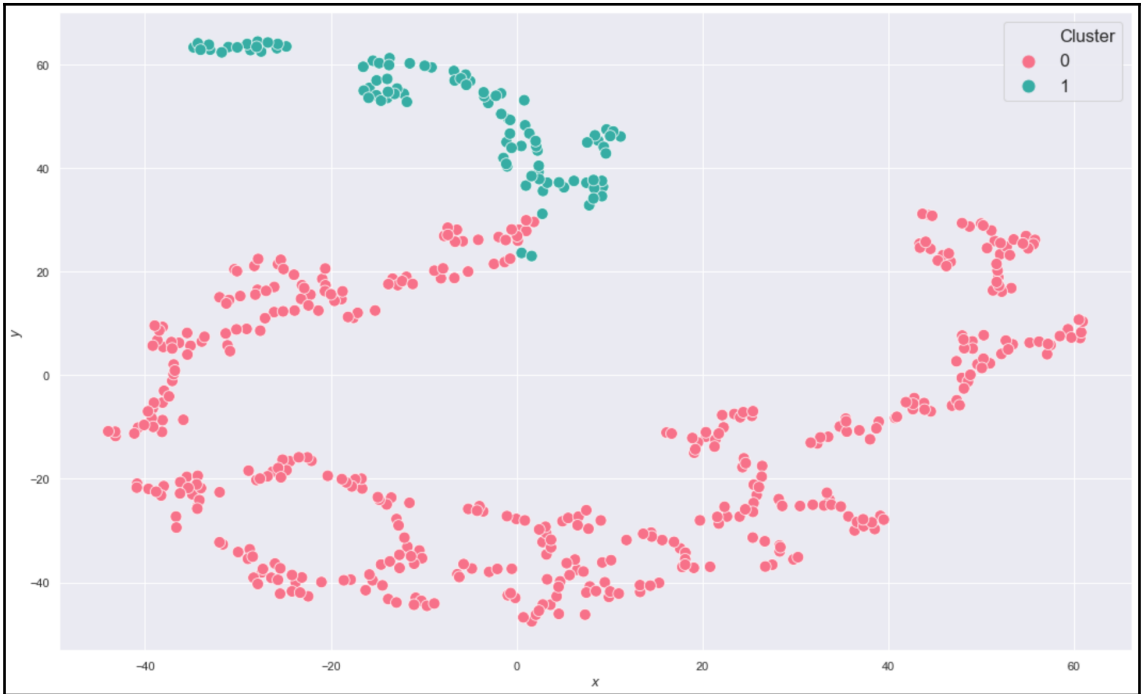


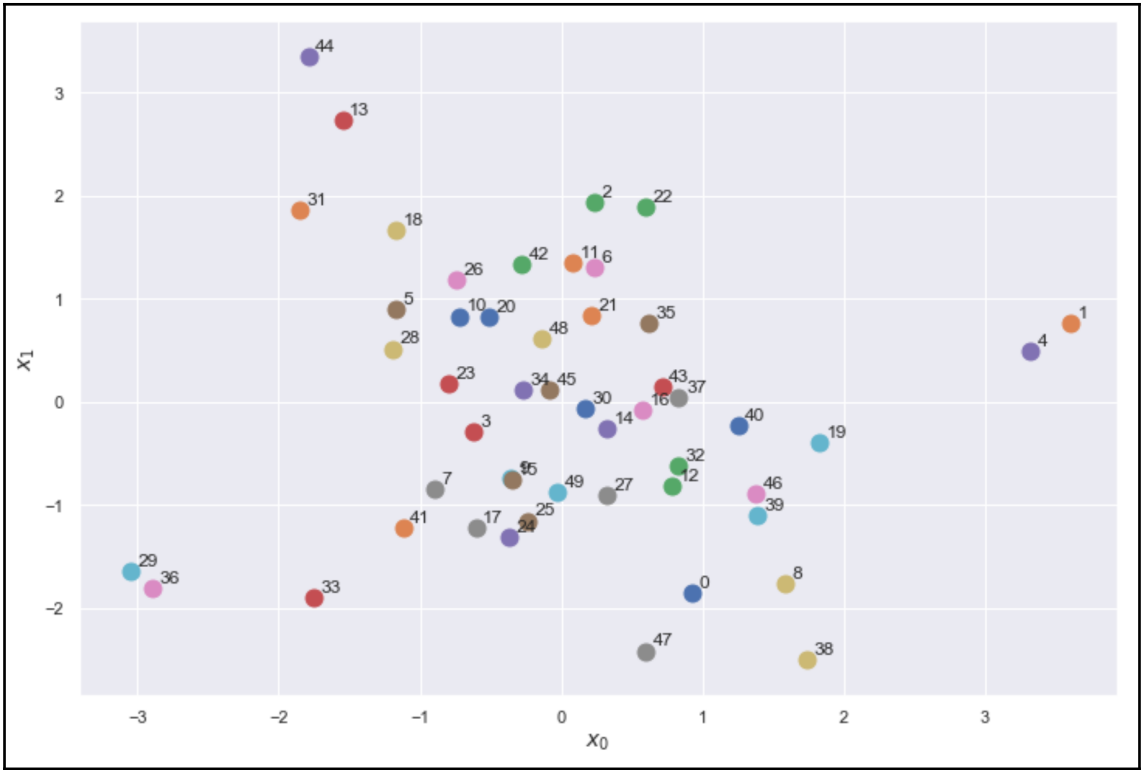




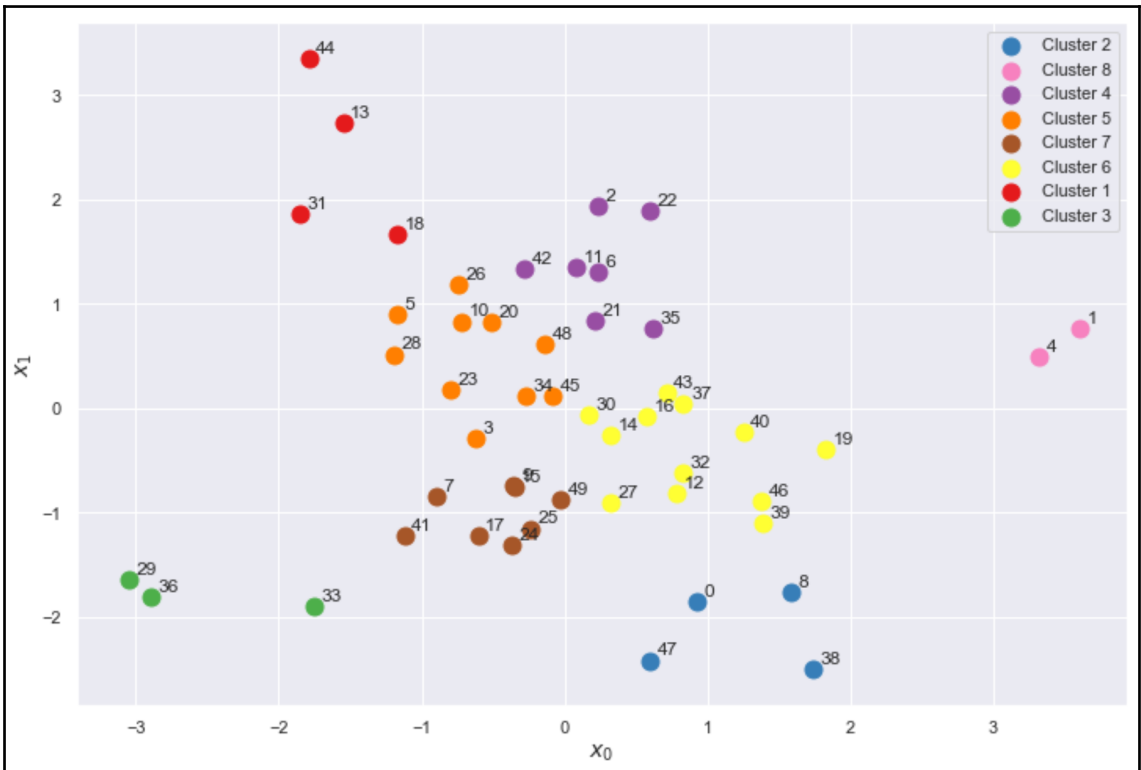
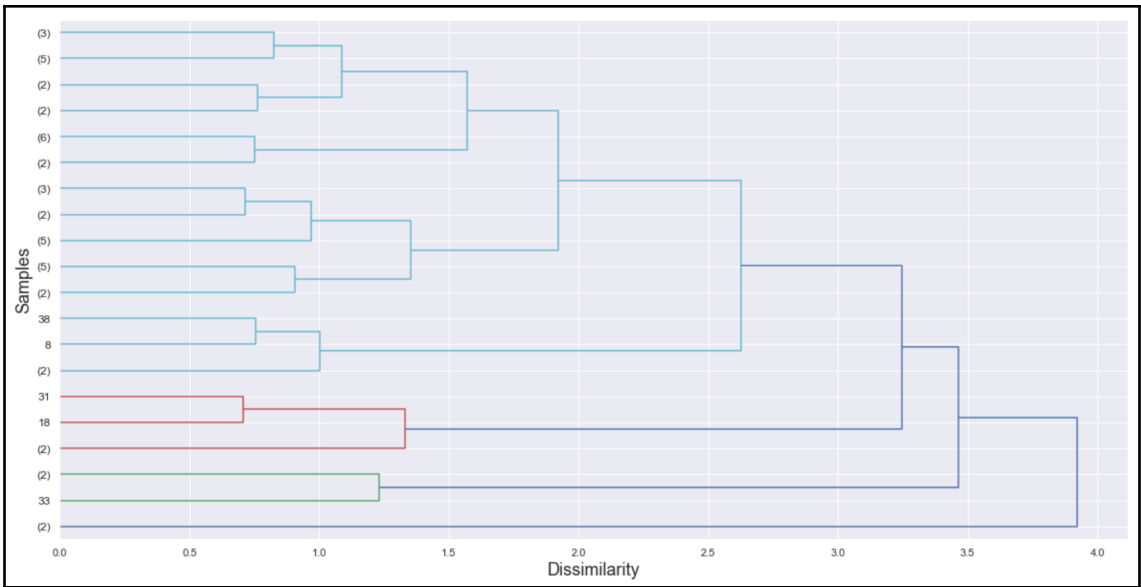


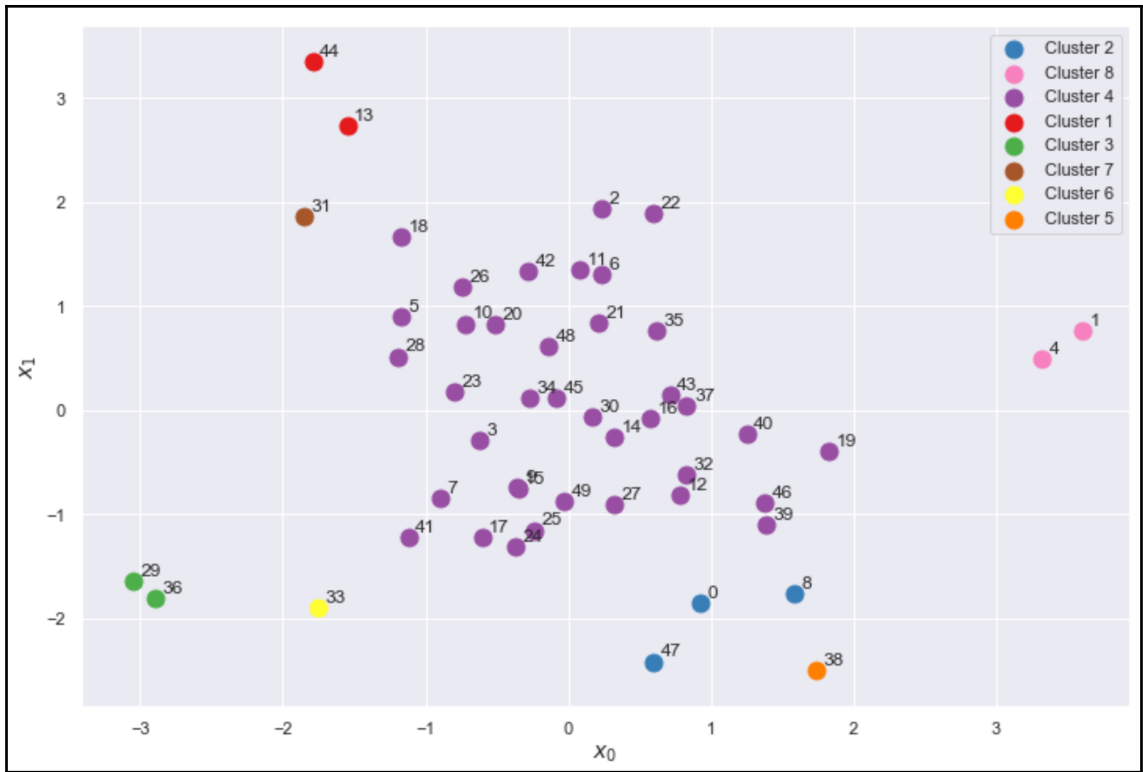






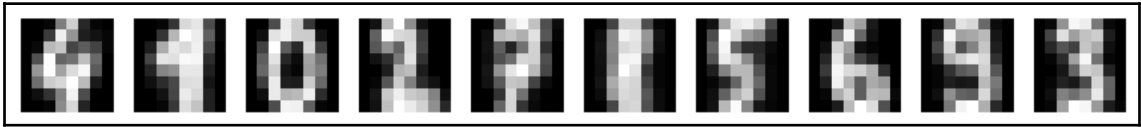
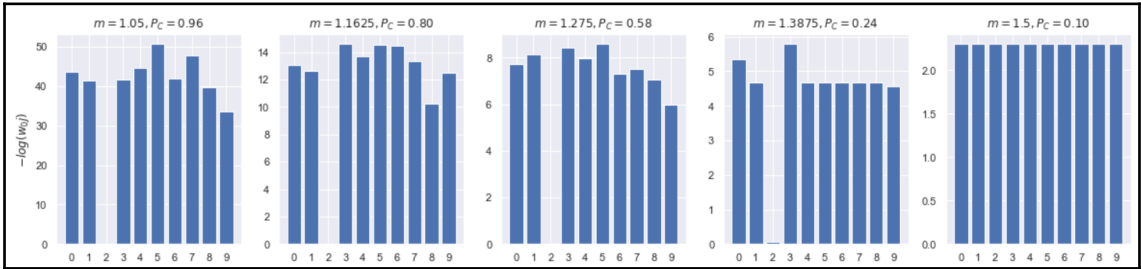


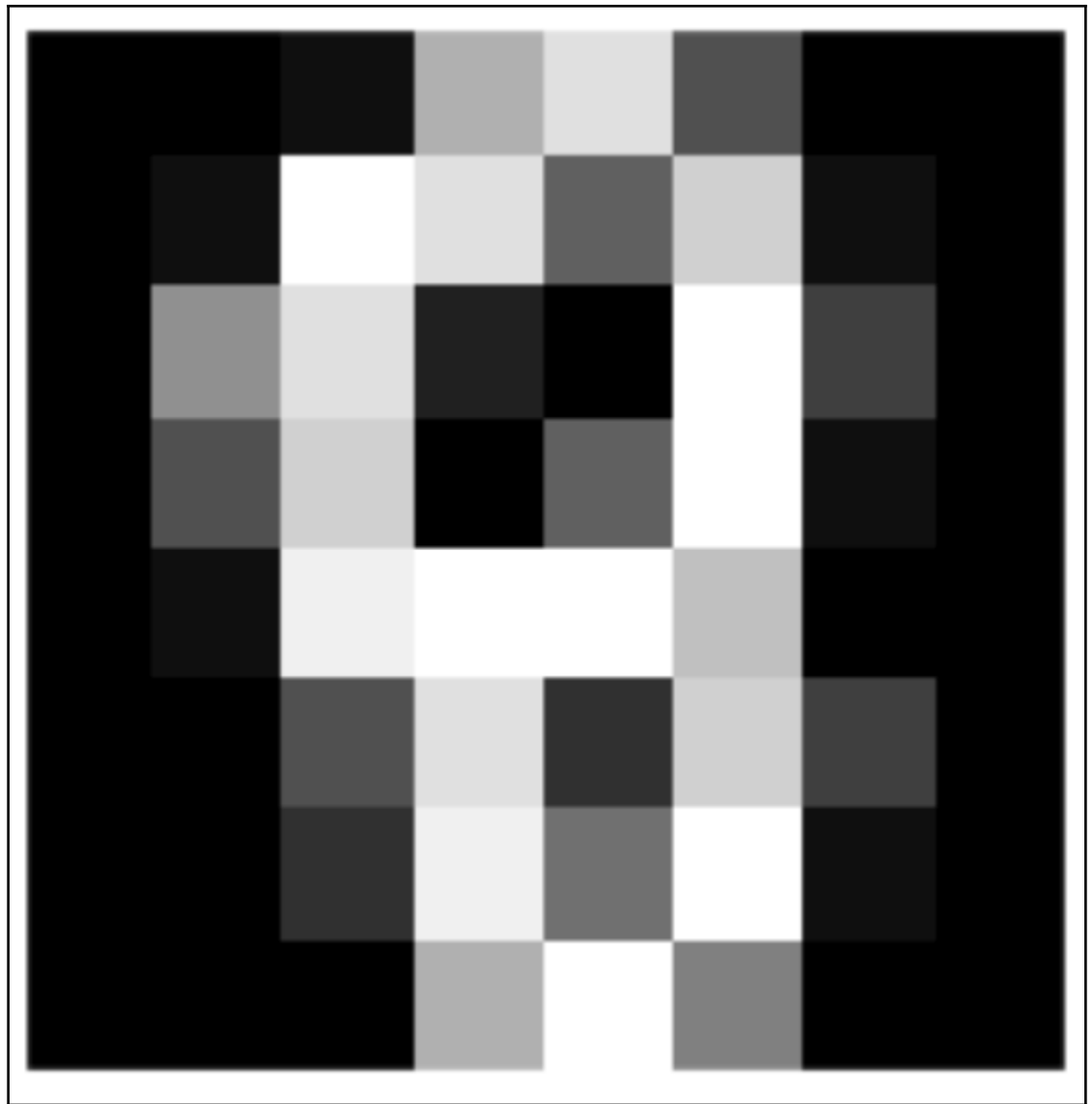


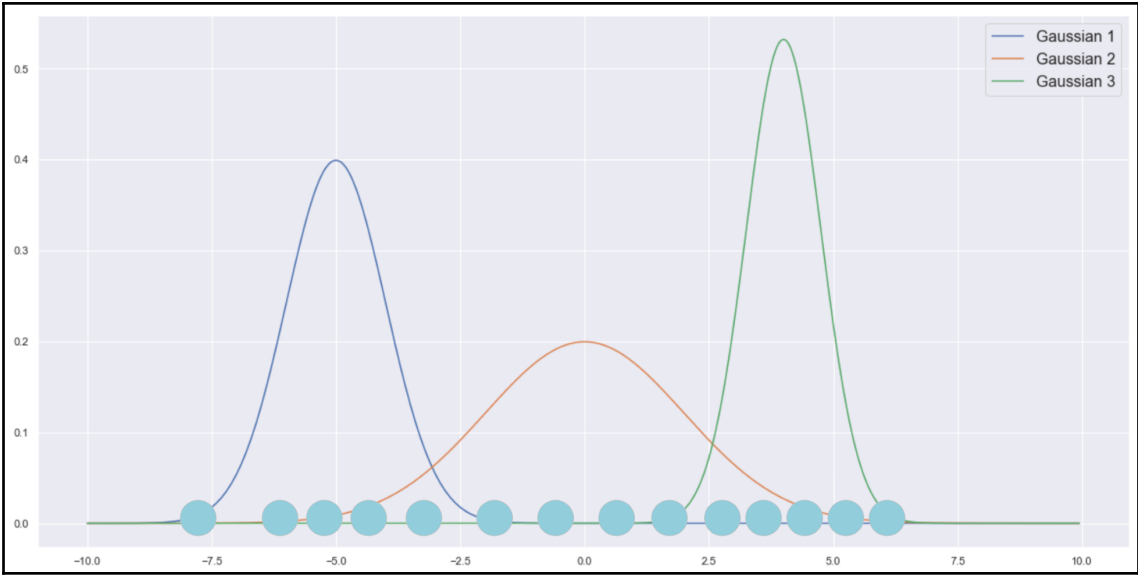
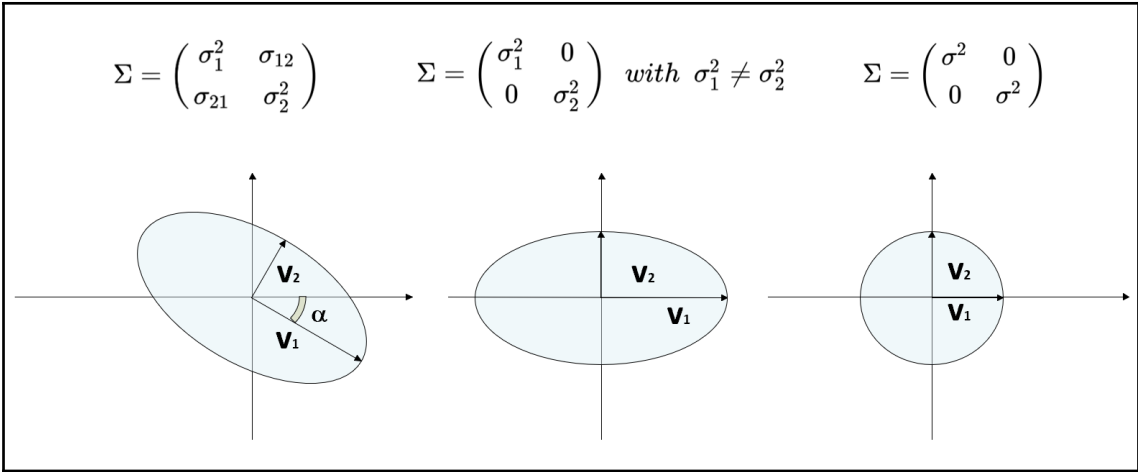


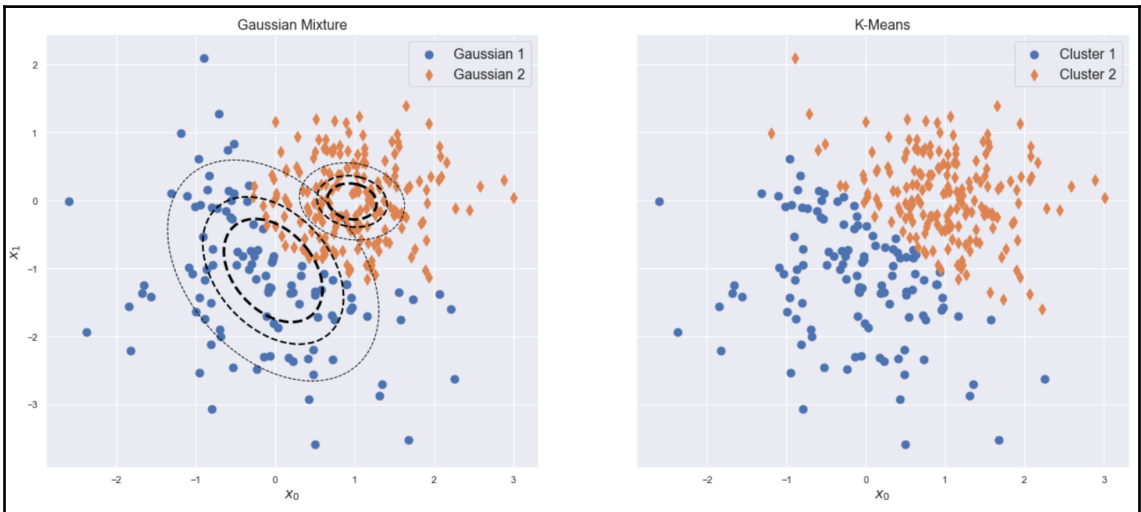
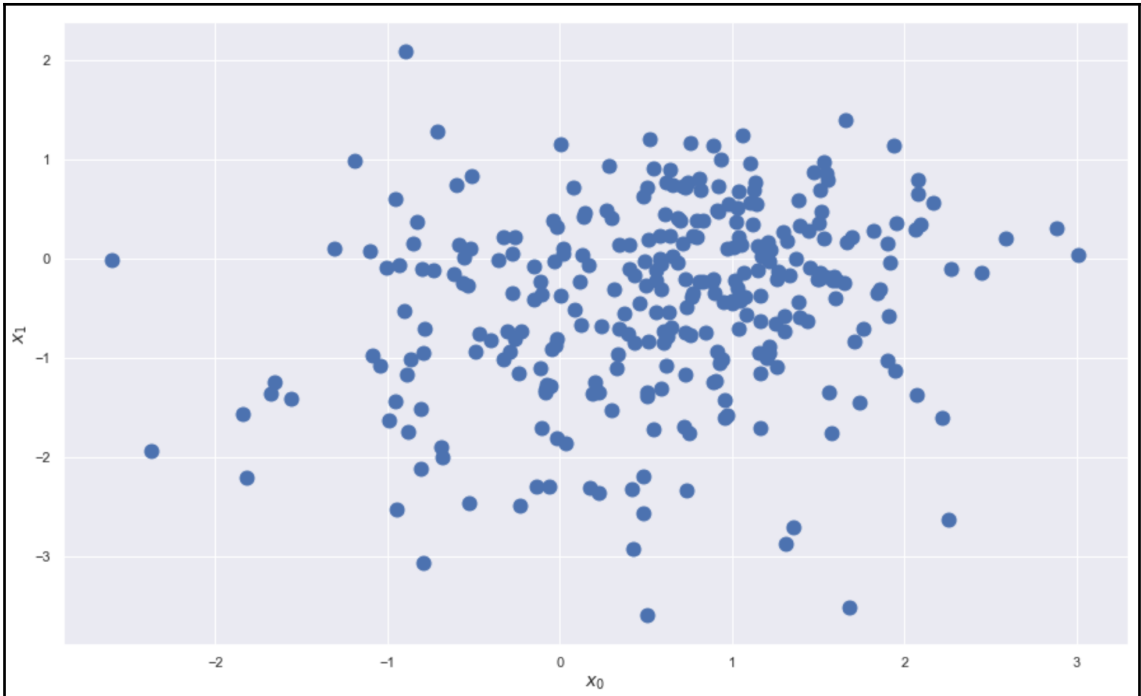
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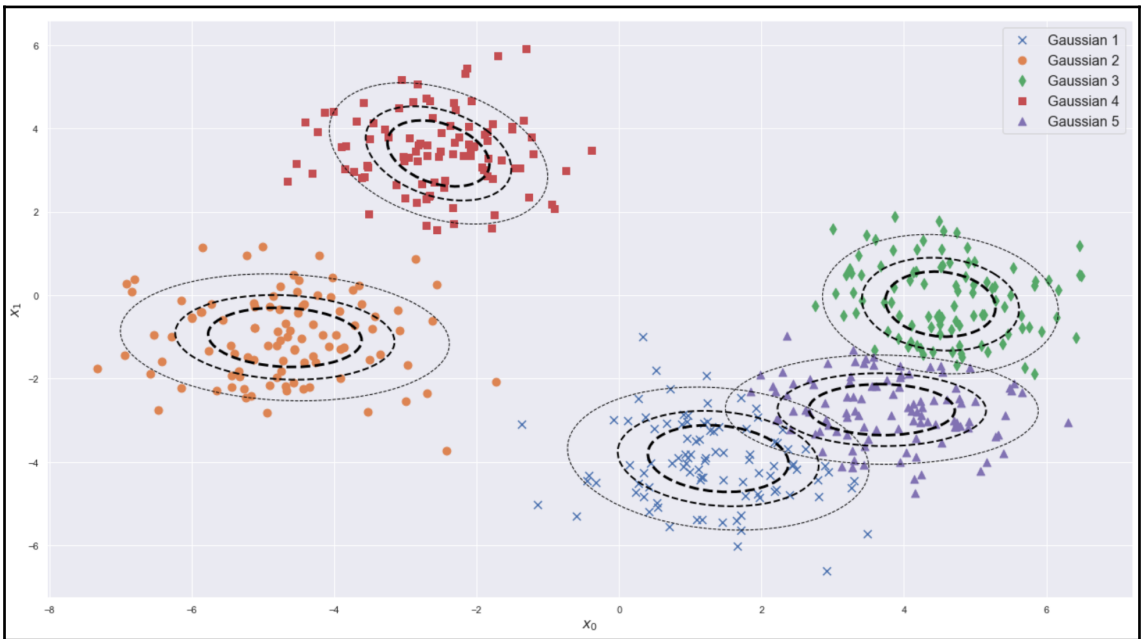
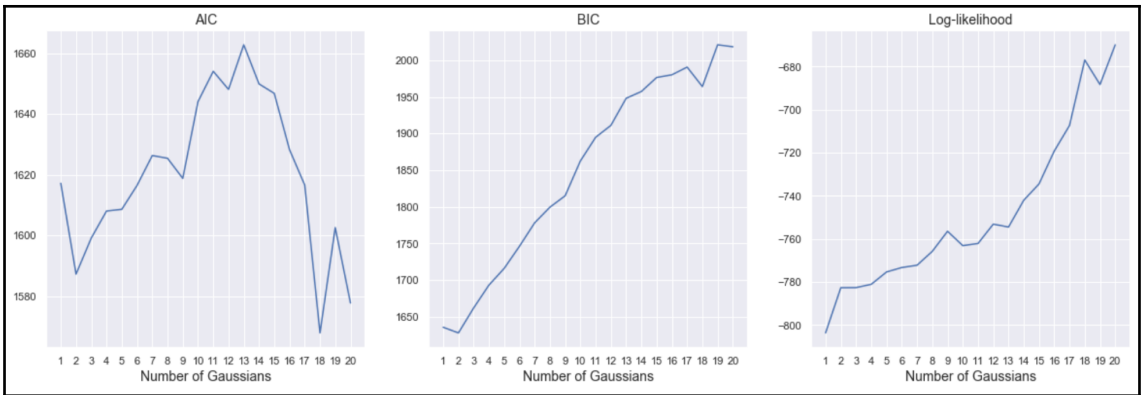
# Chapter 5: Soft Clustering and Gaussian Mixture Models

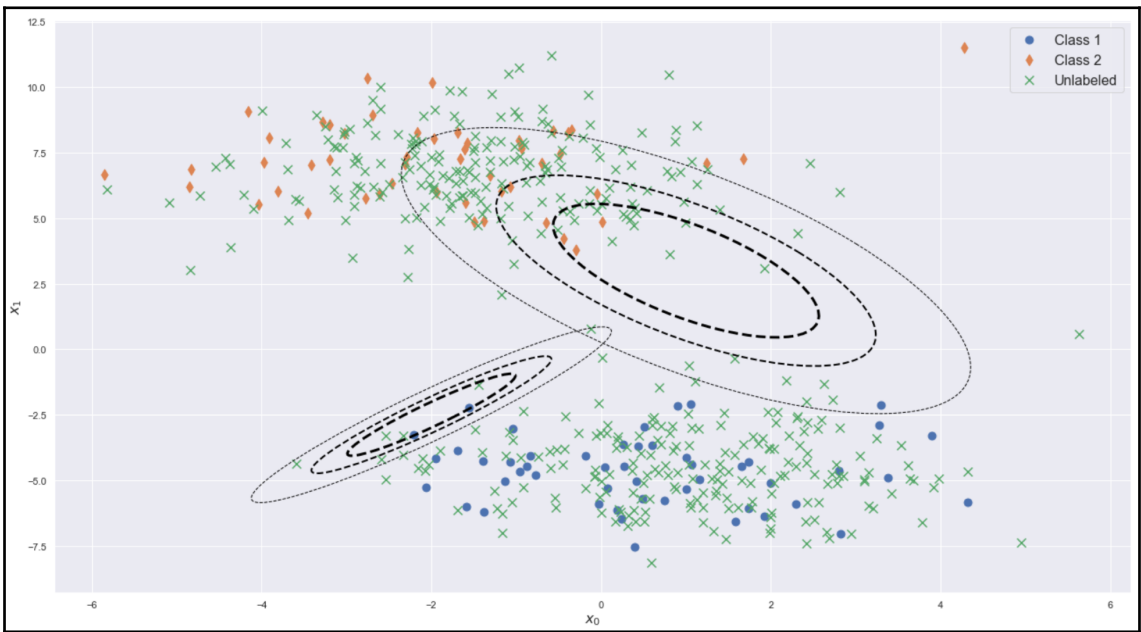
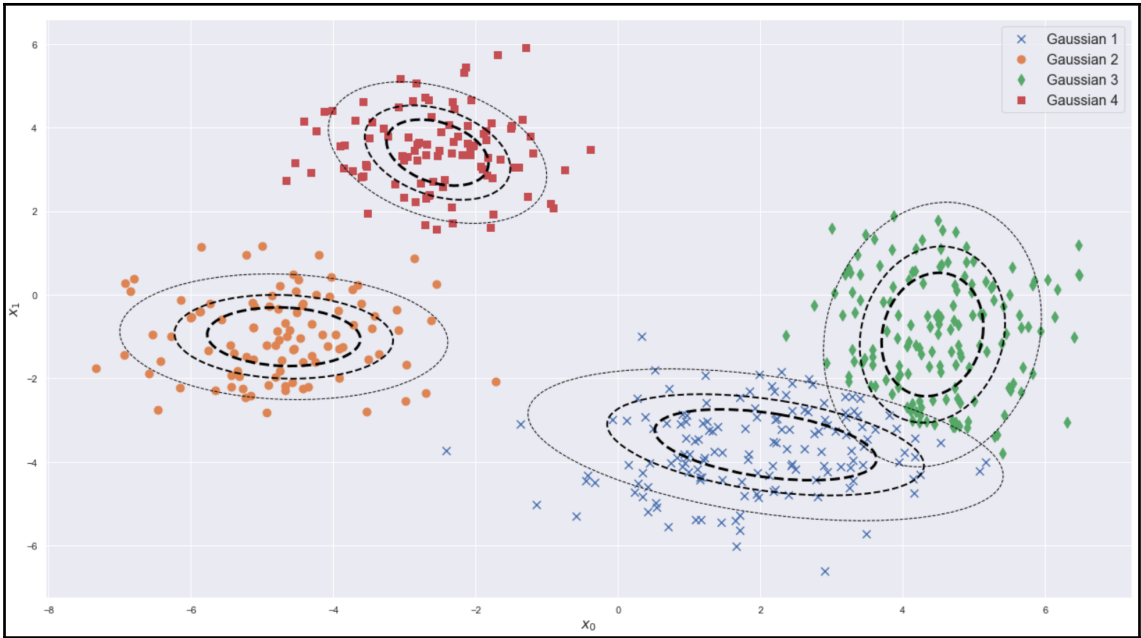




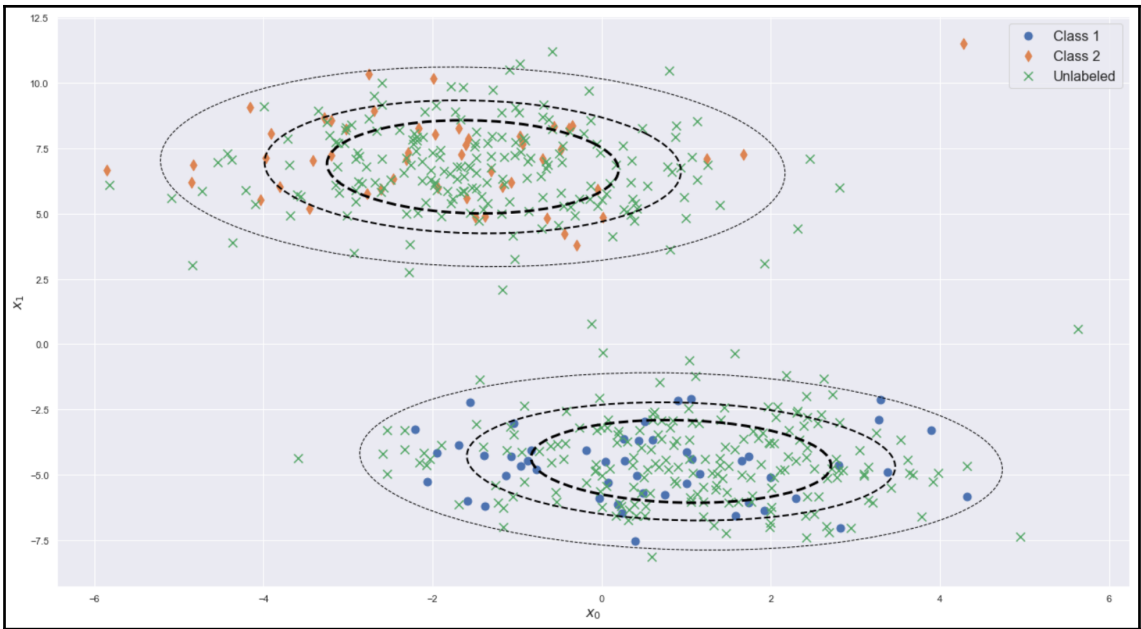






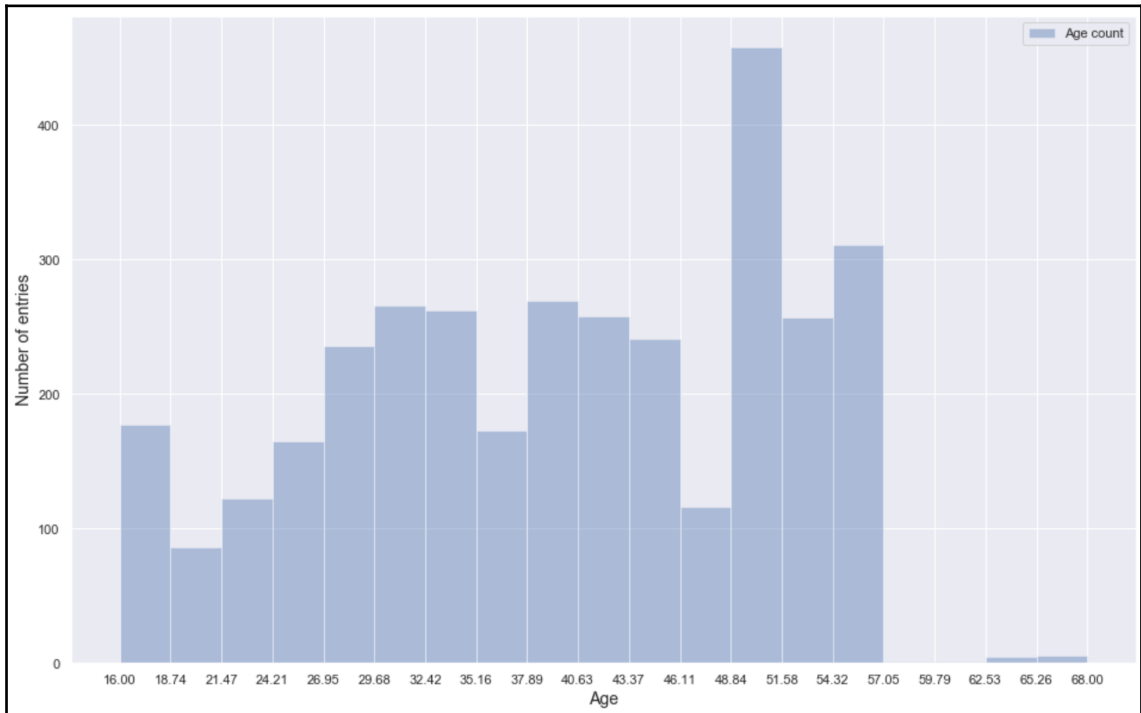


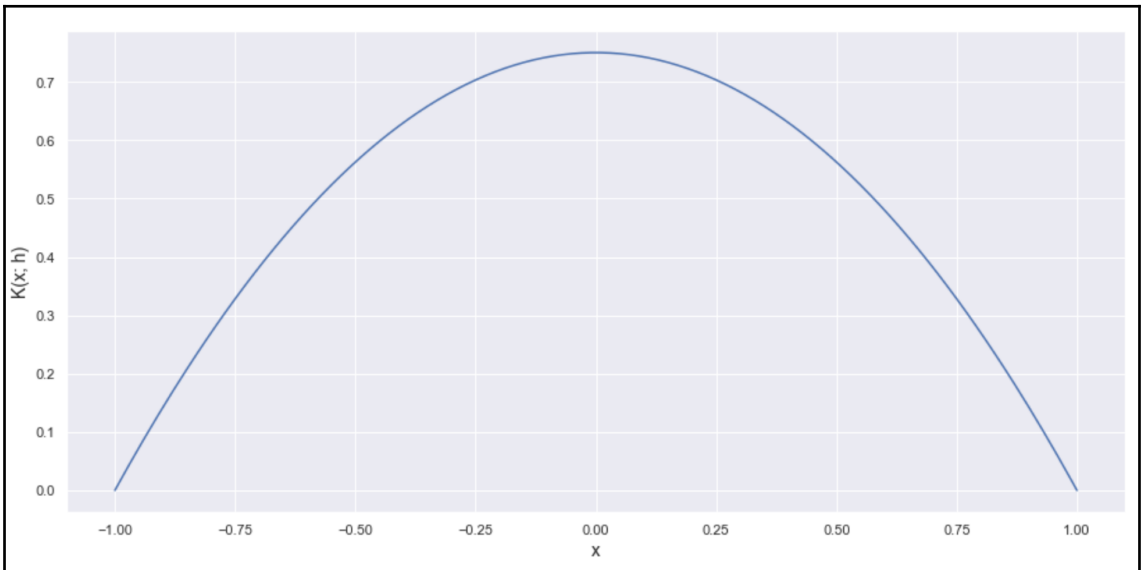
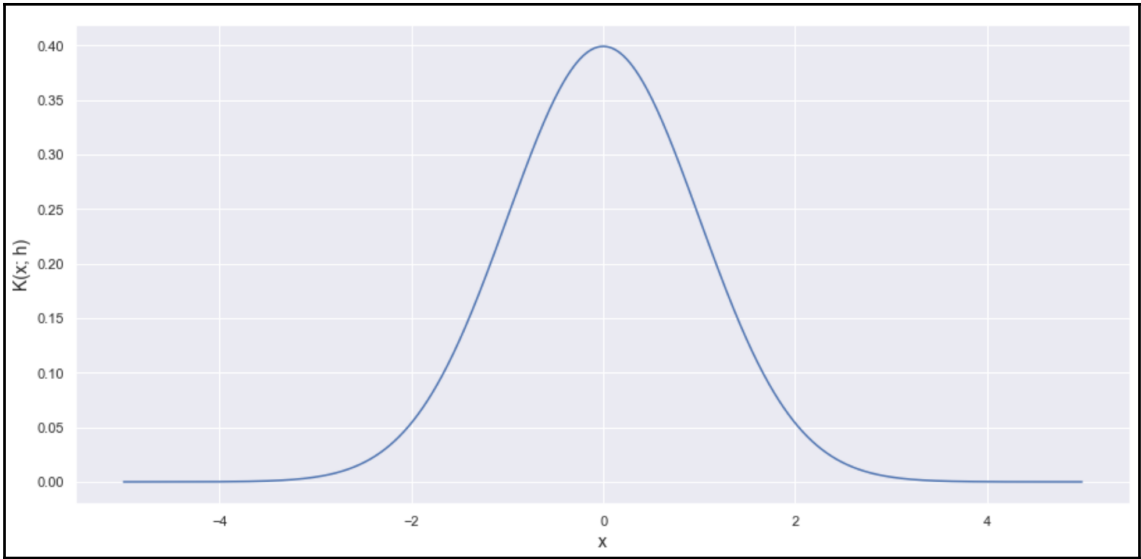


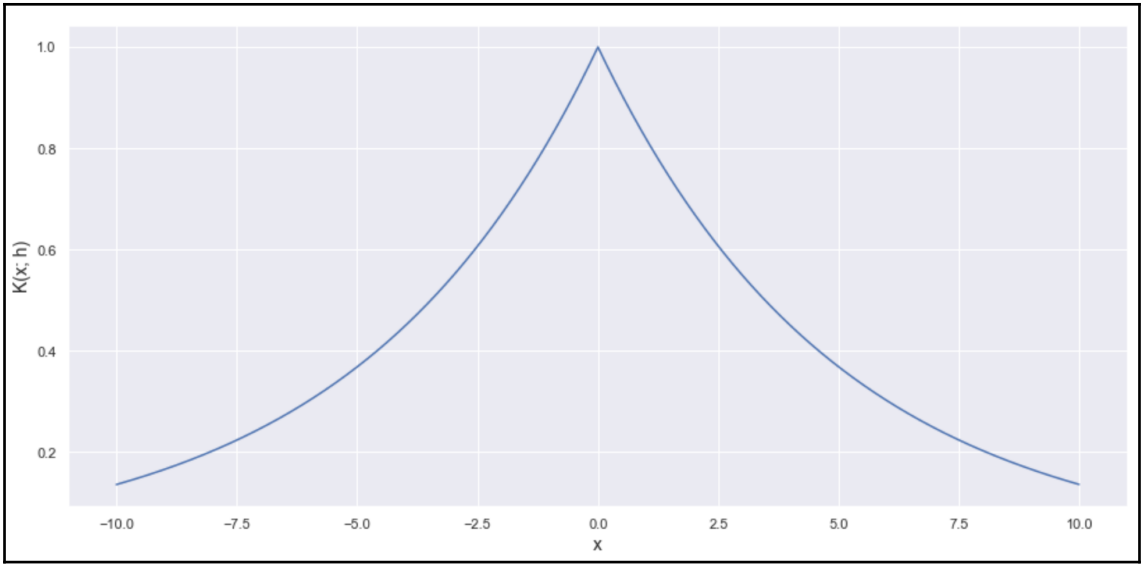


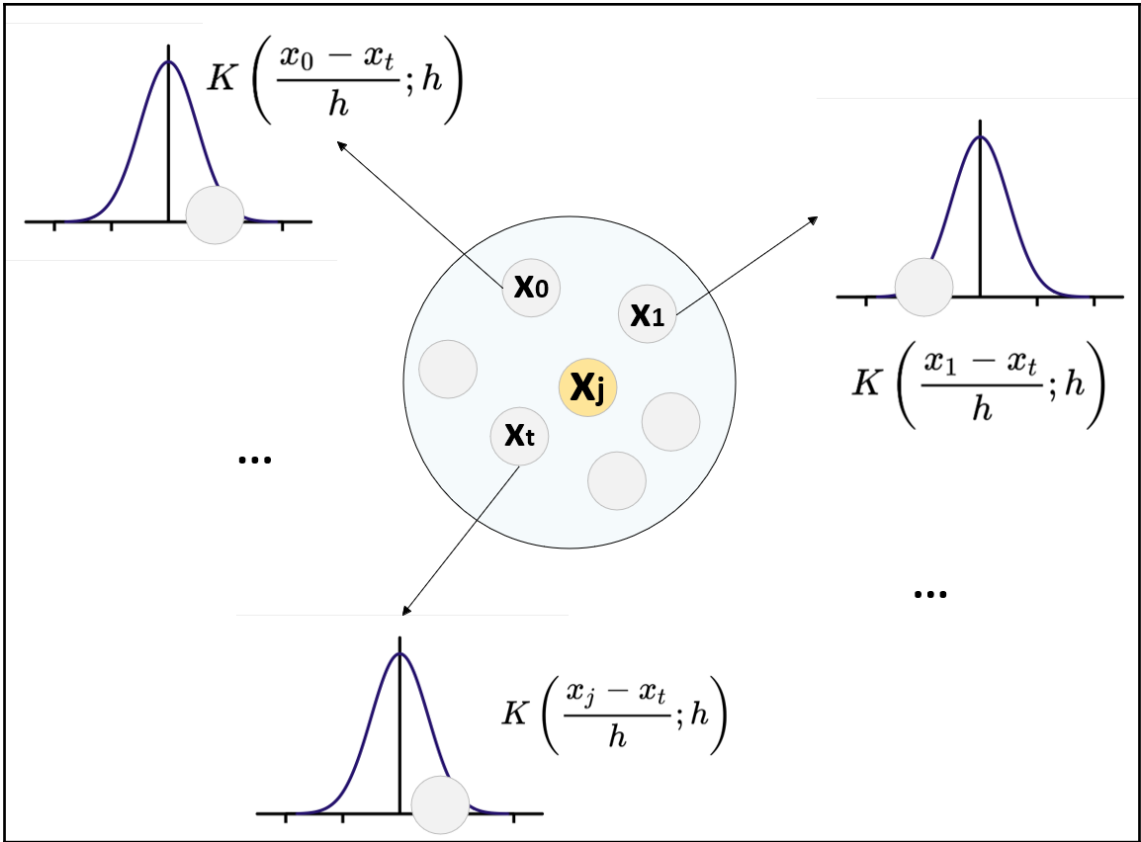
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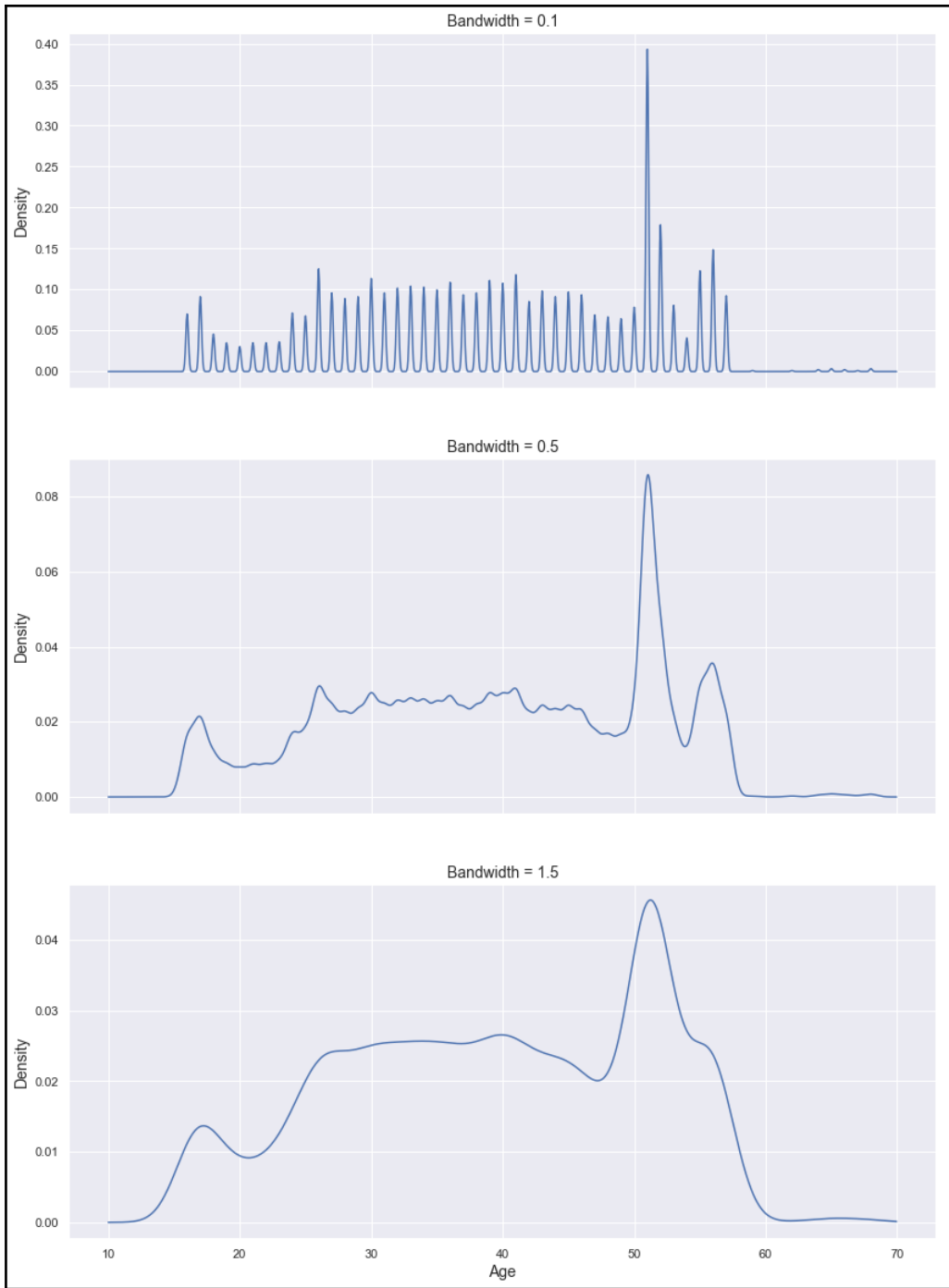
## Chapter 6: Anomaly Detection

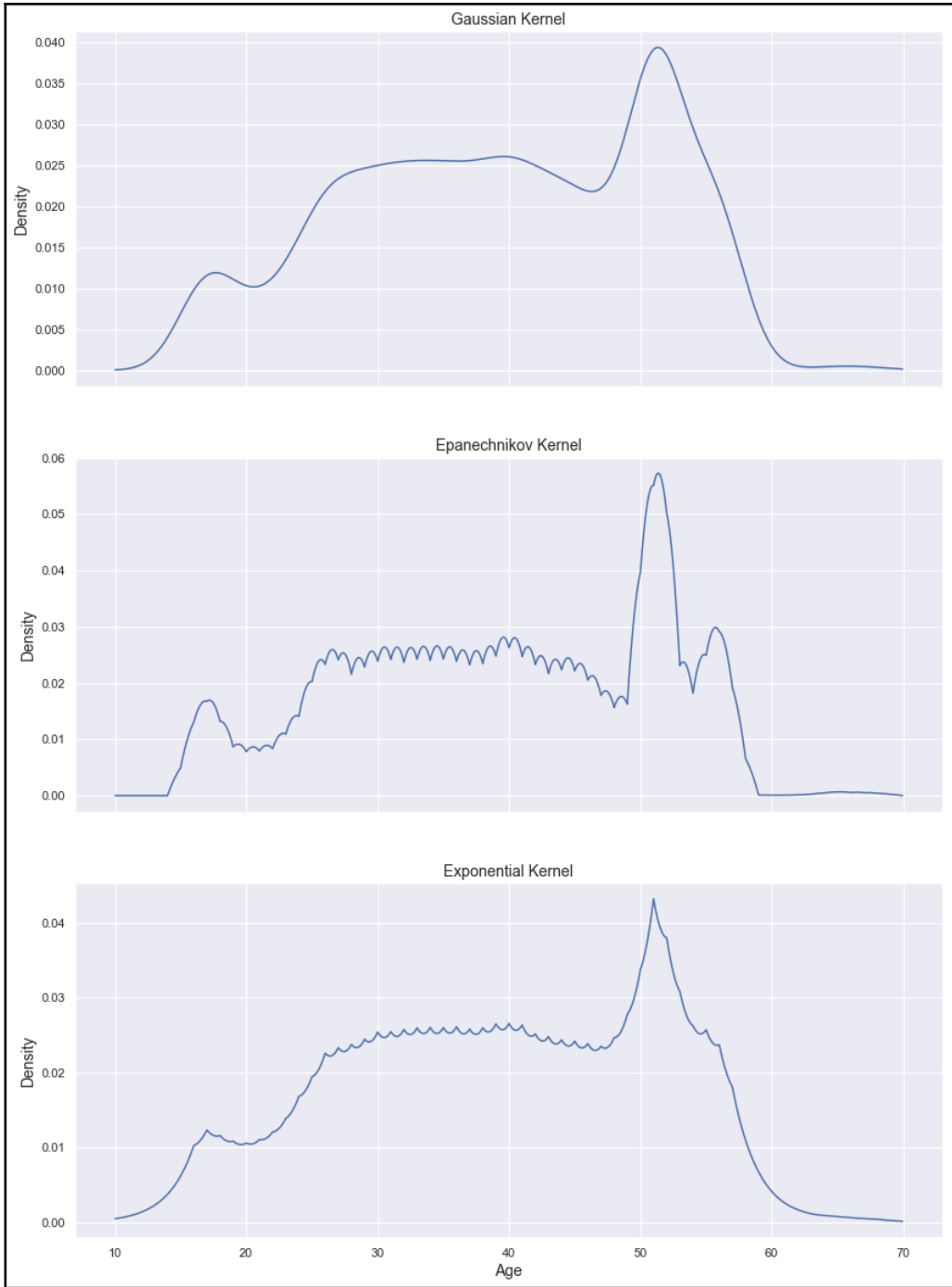


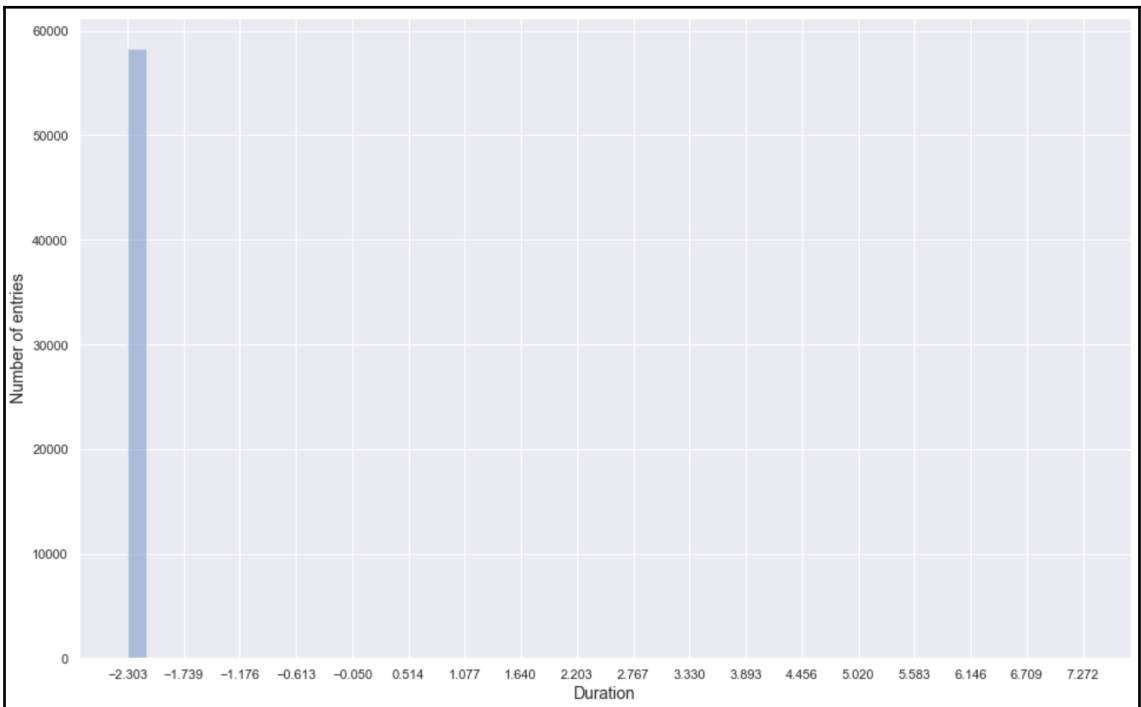
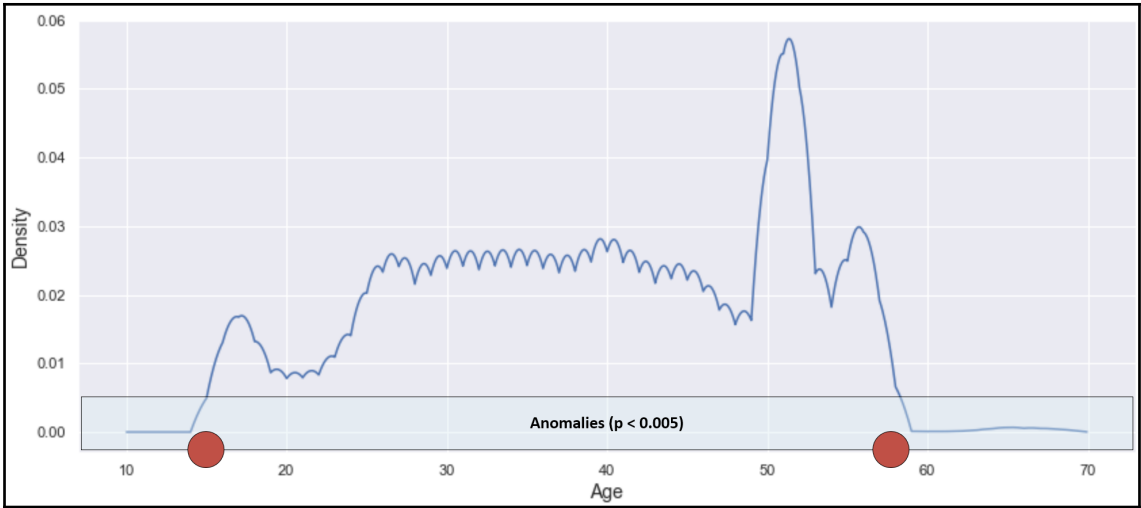




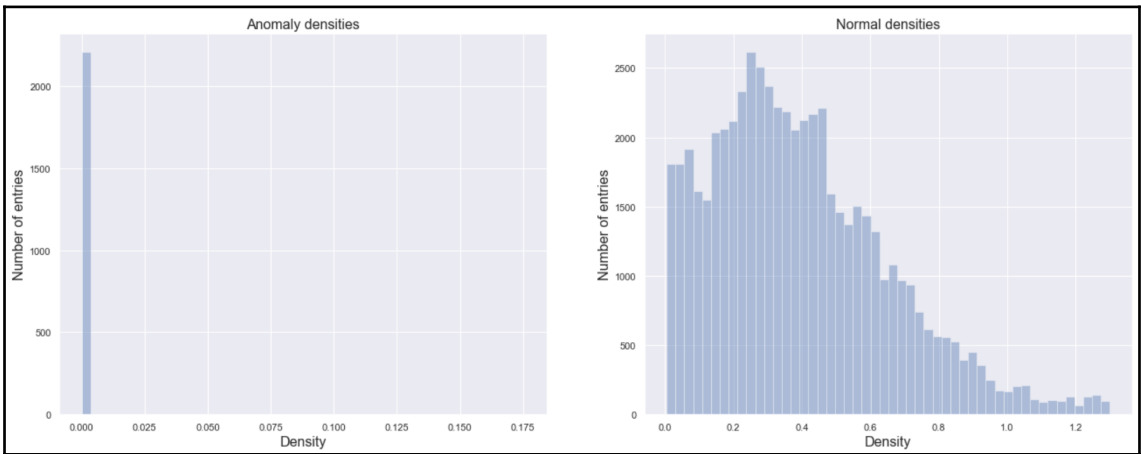
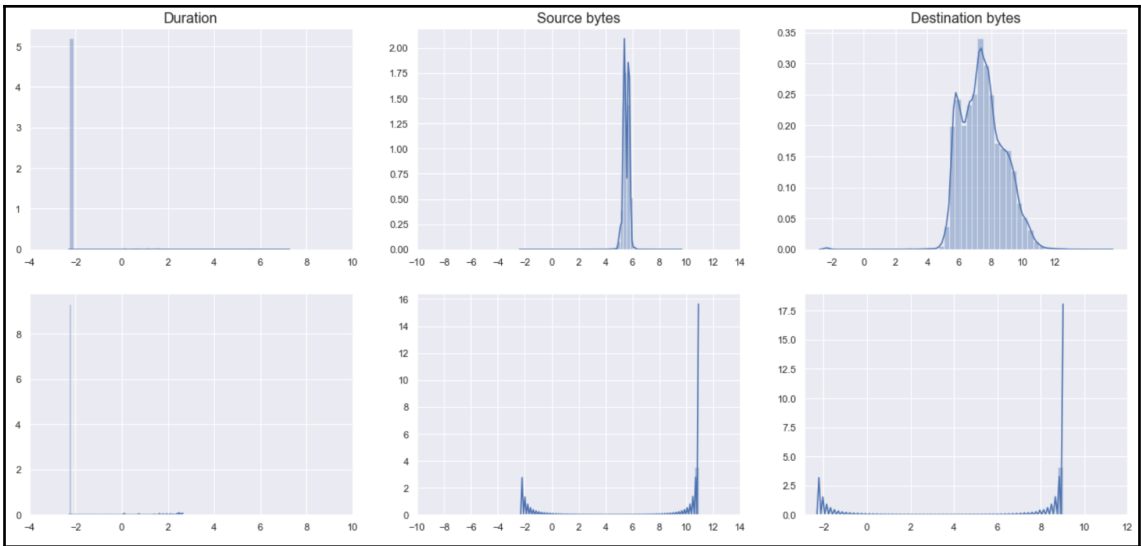


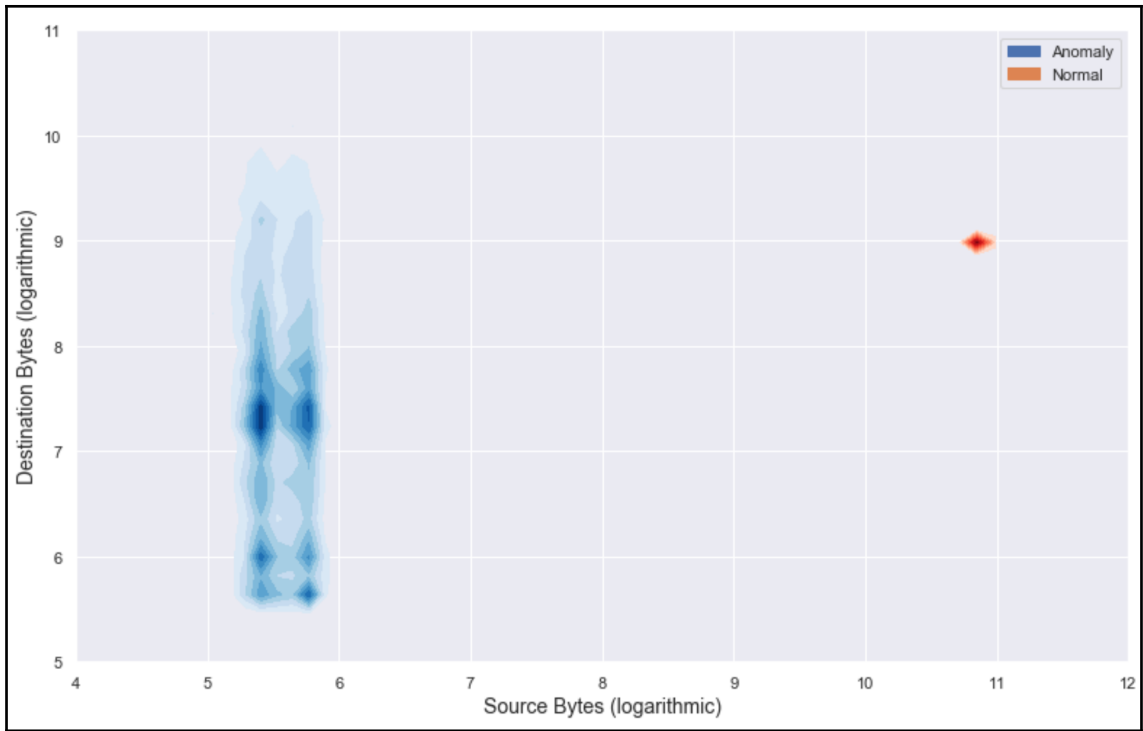


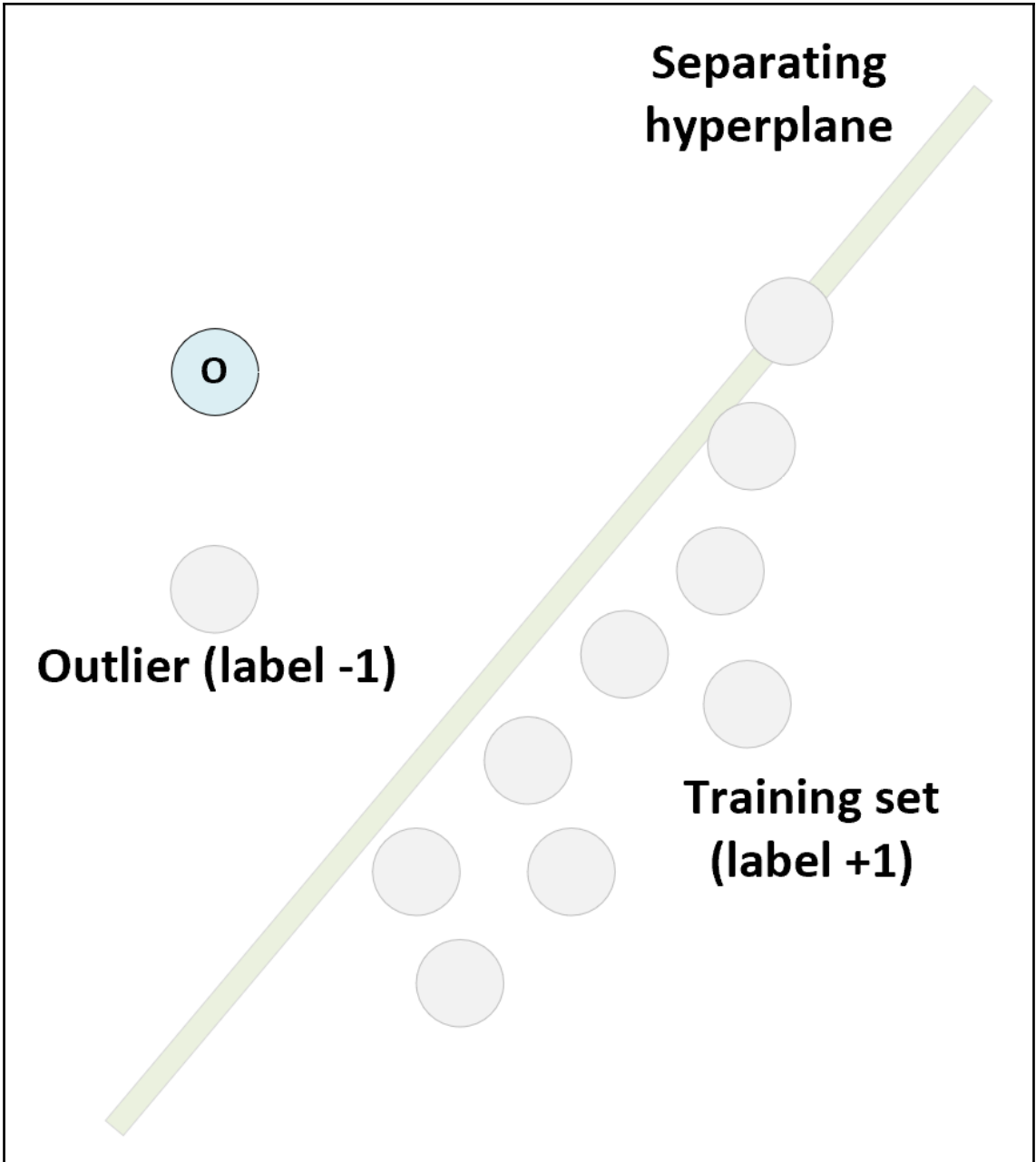


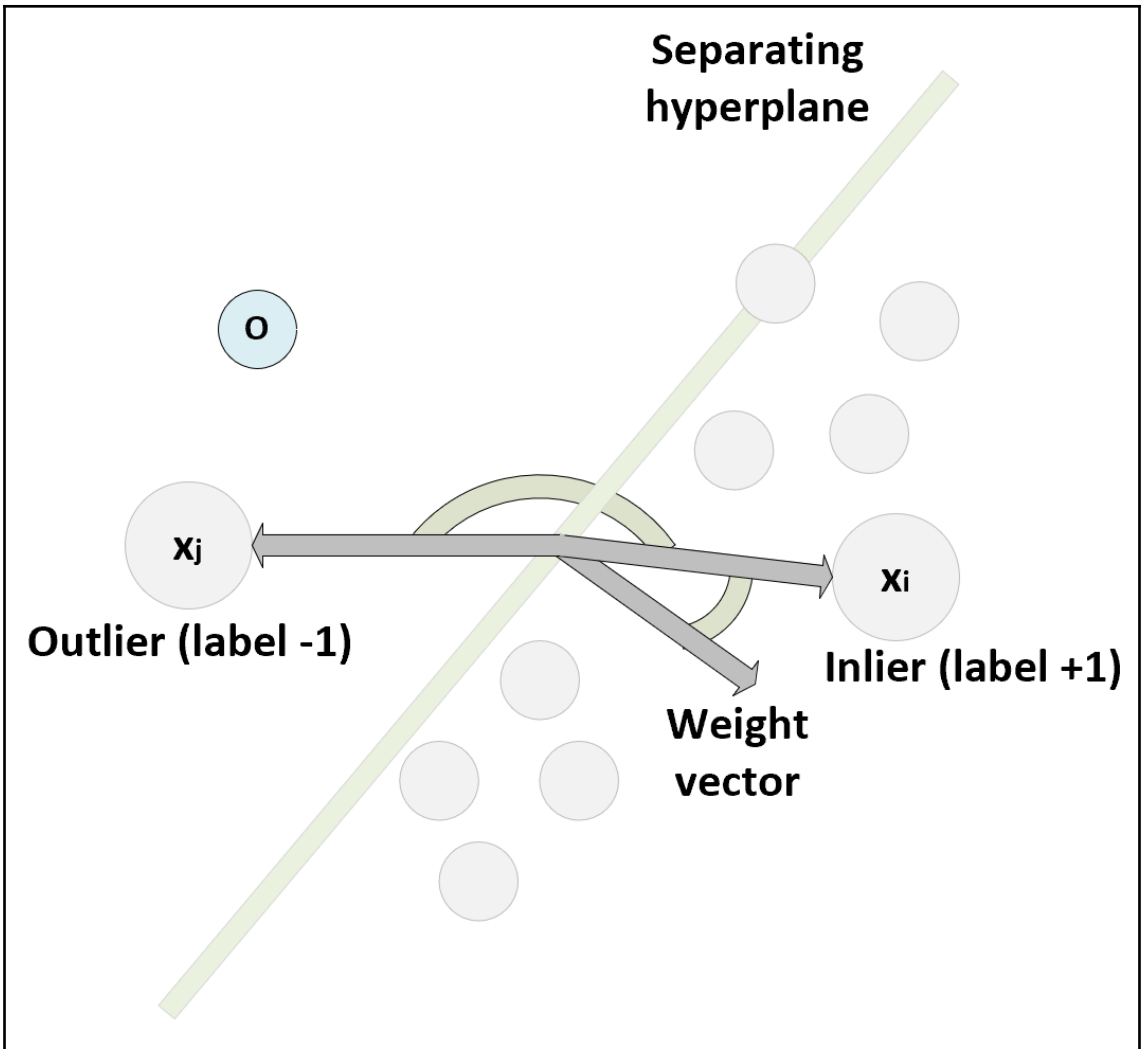


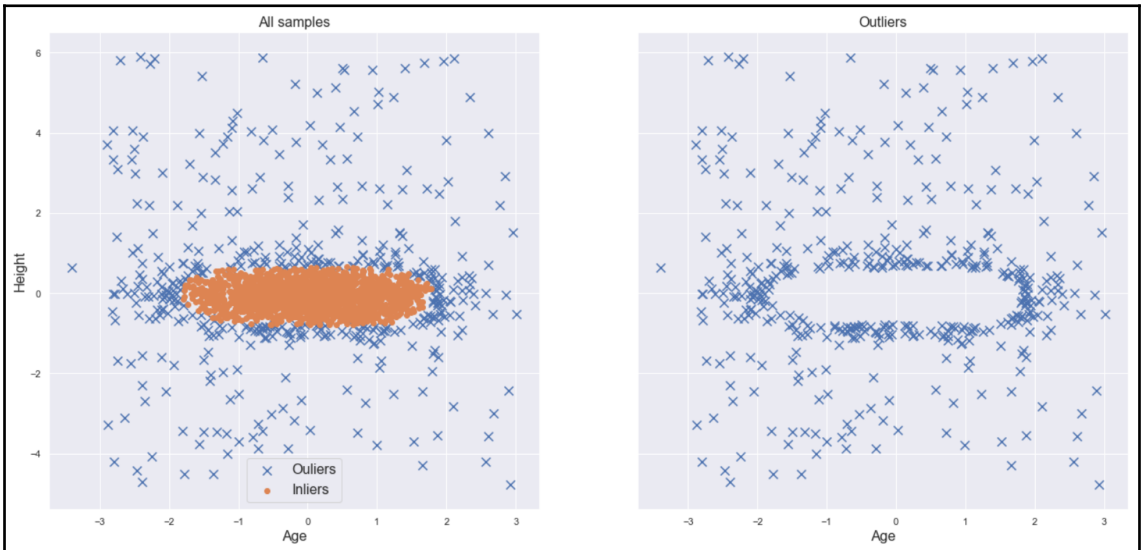
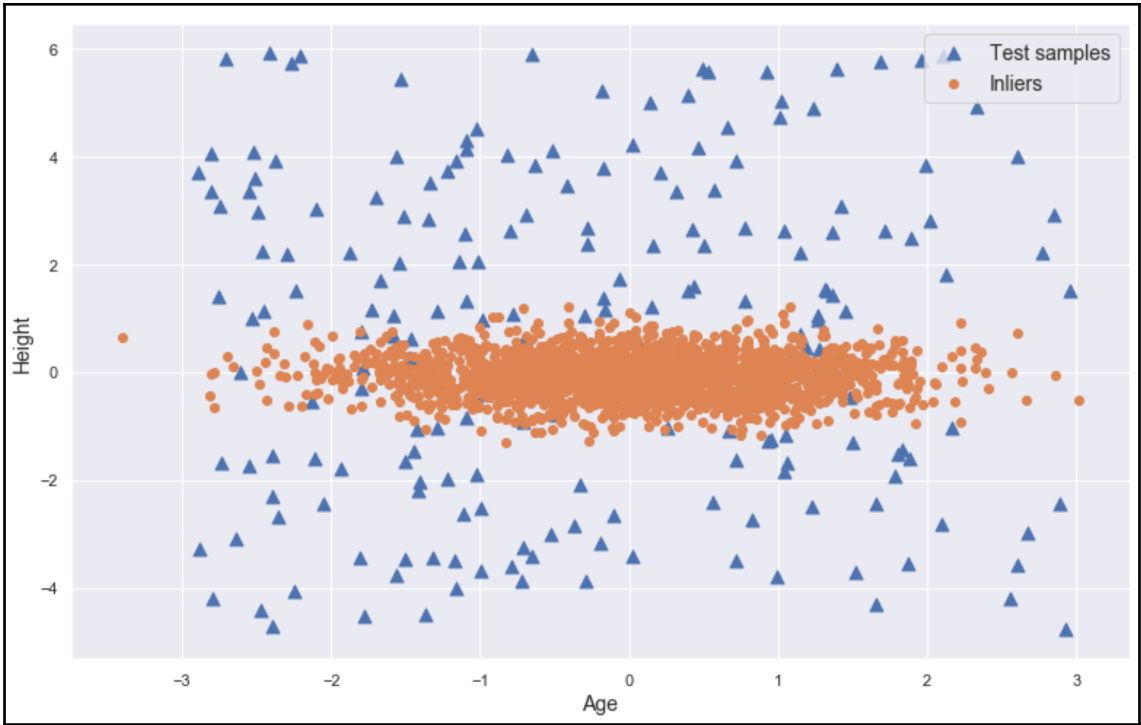


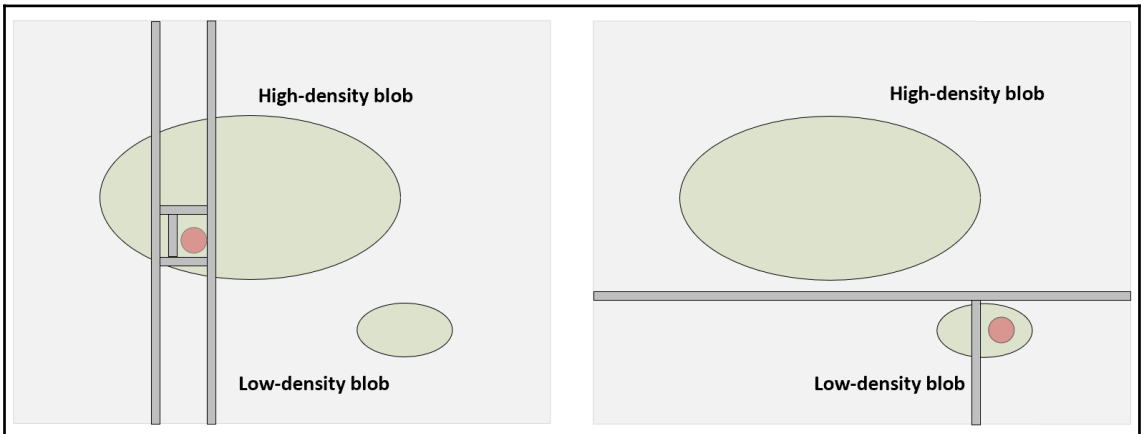
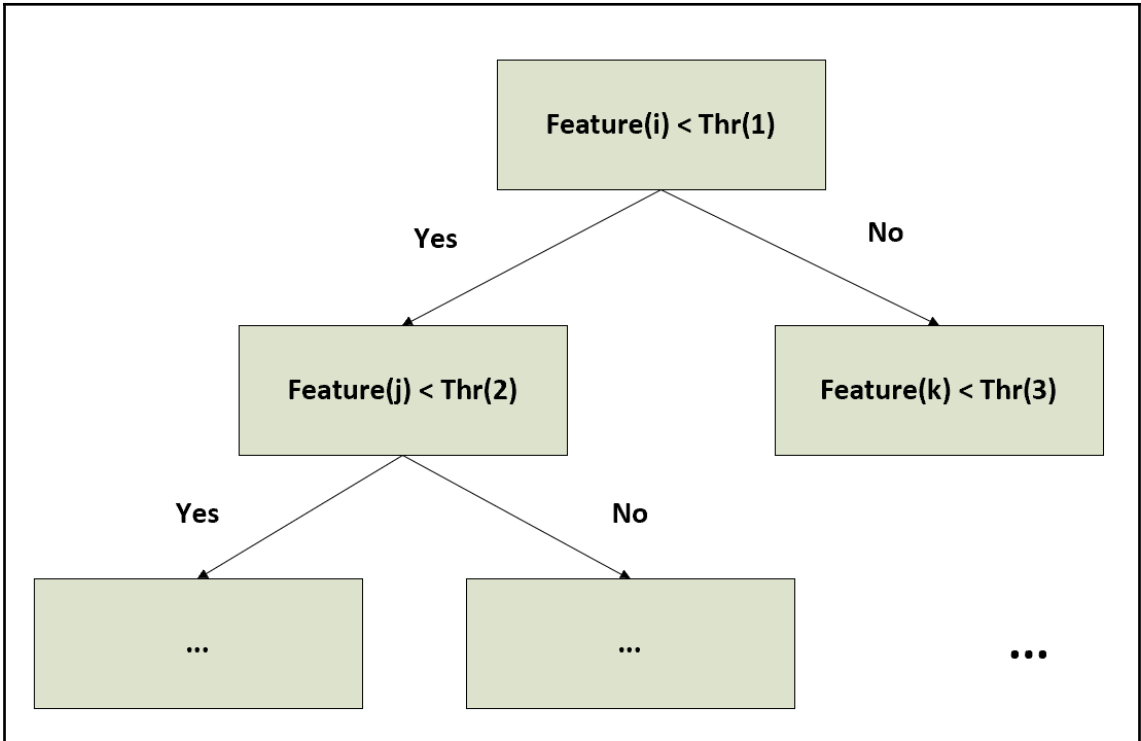


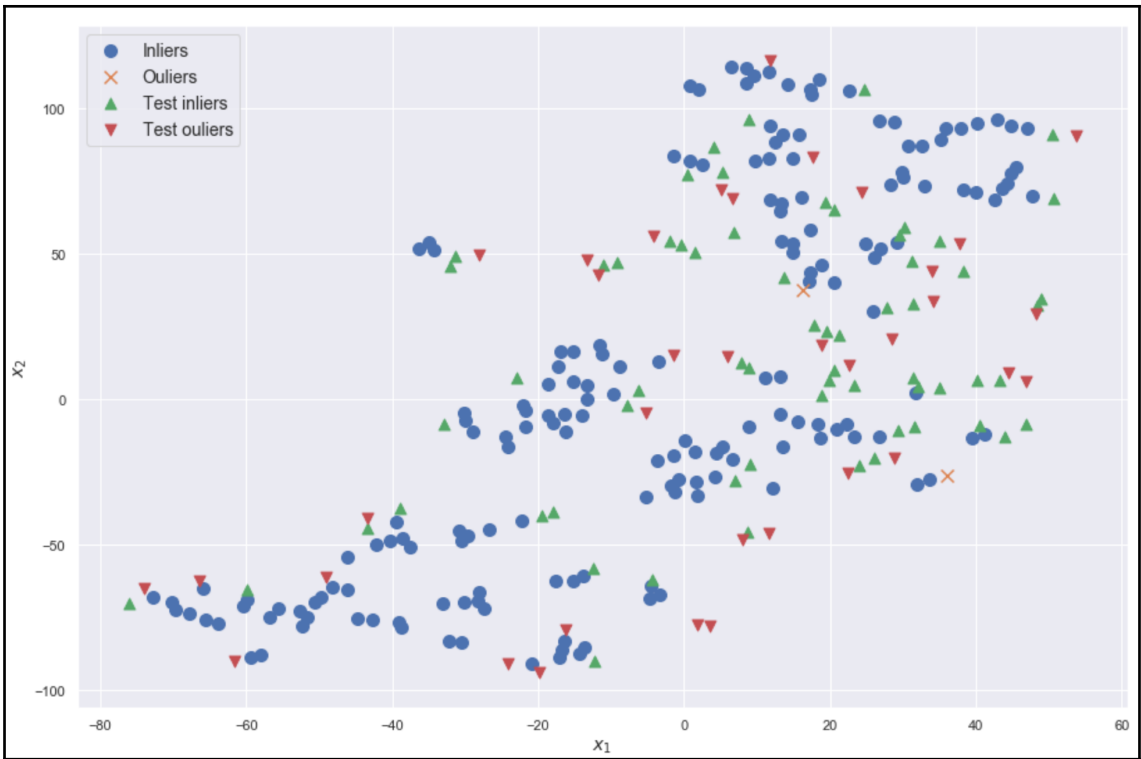






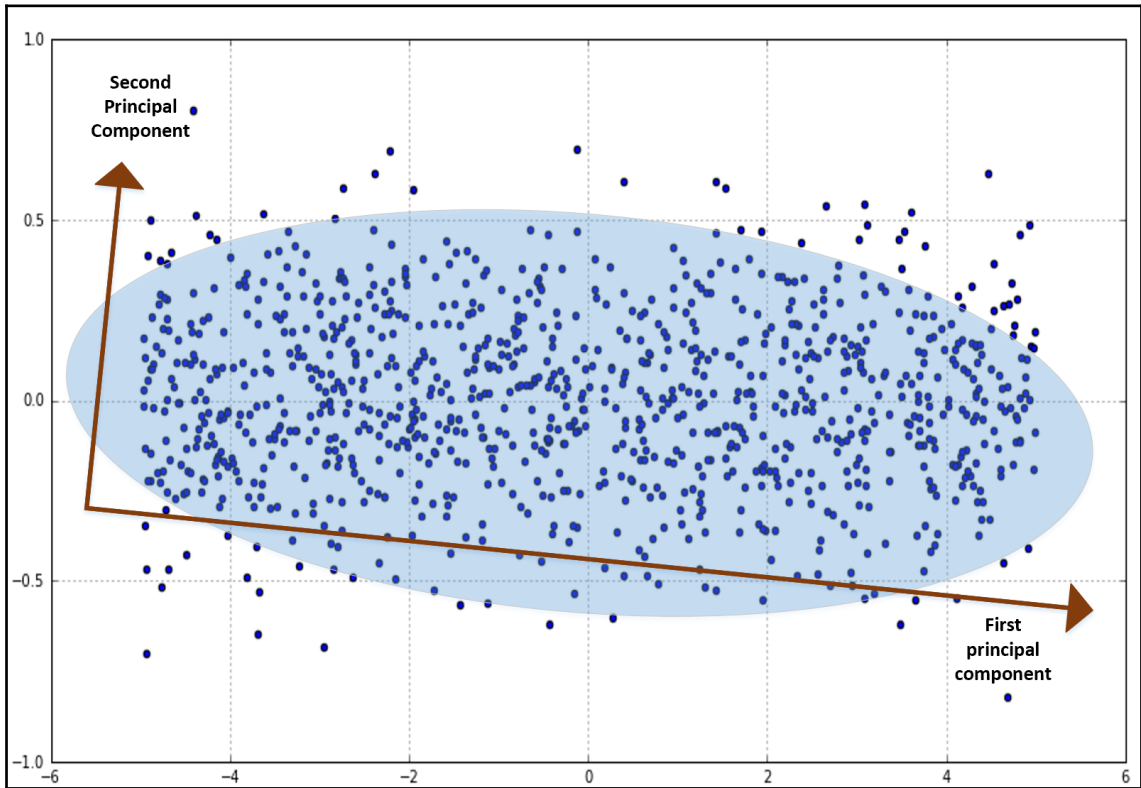




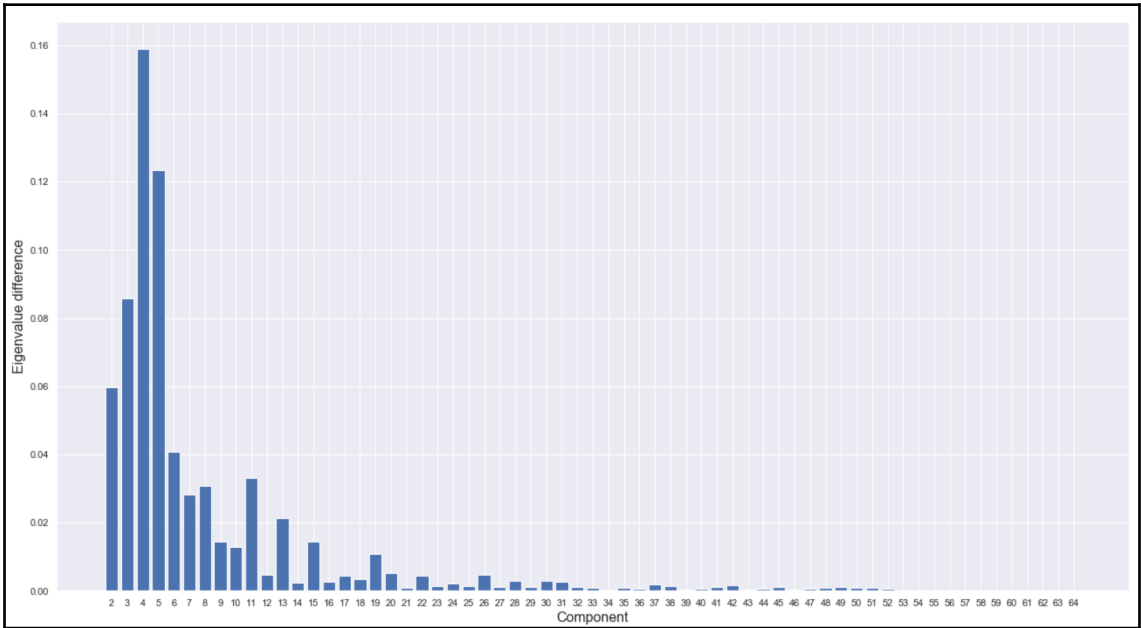
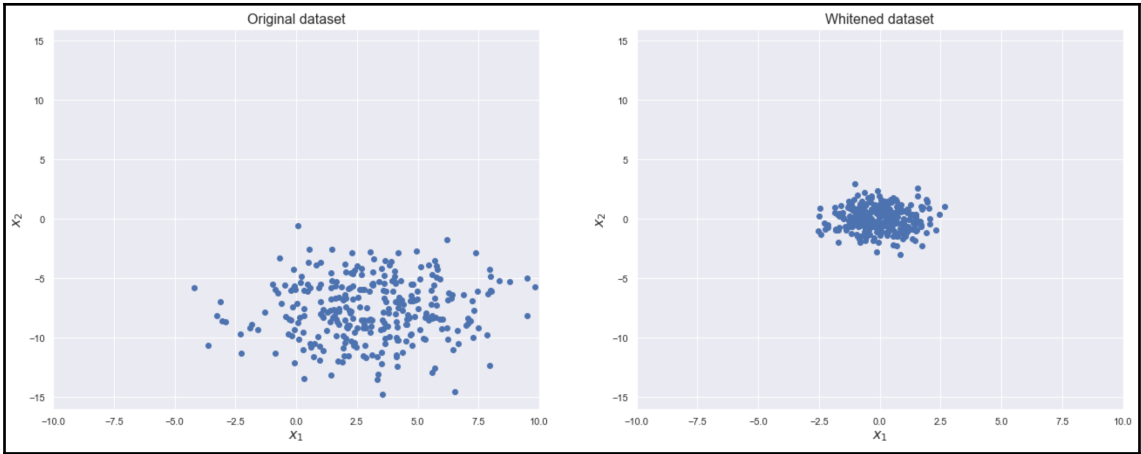


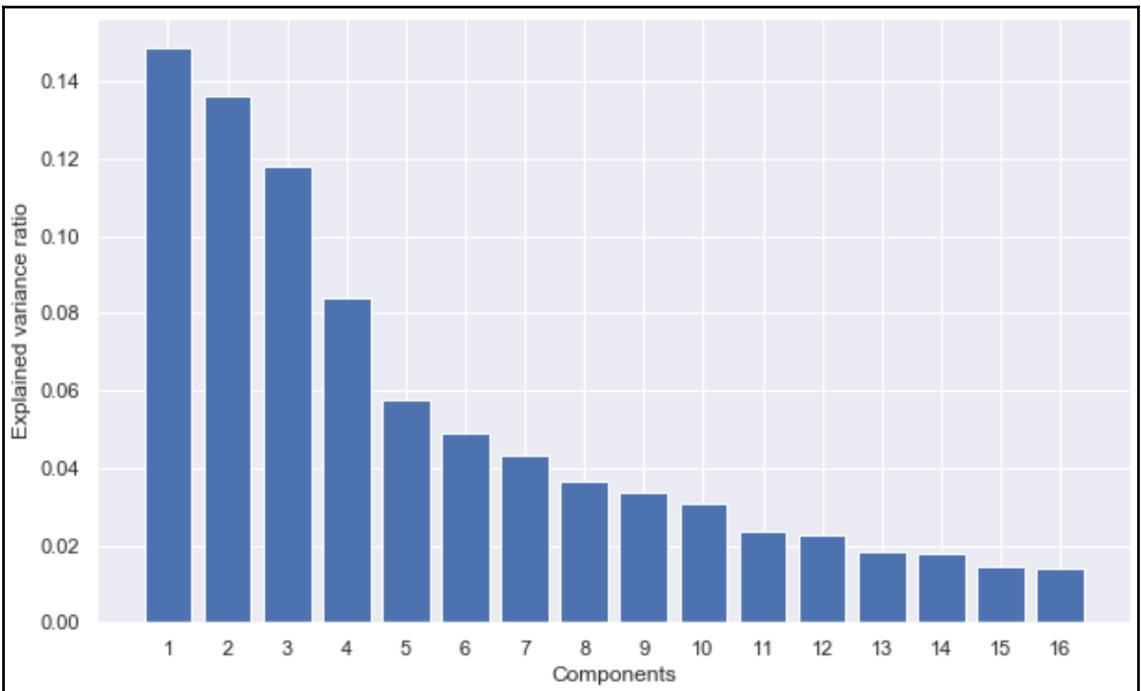
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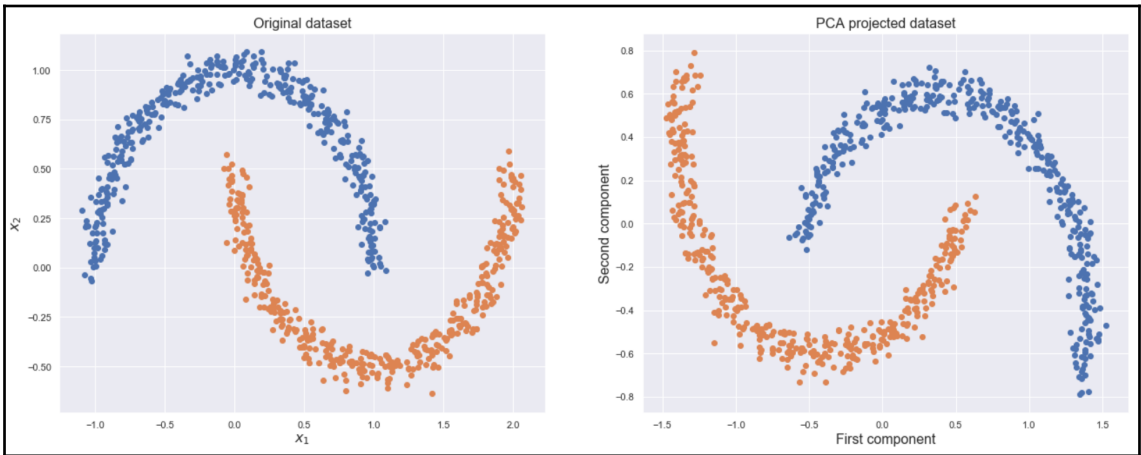
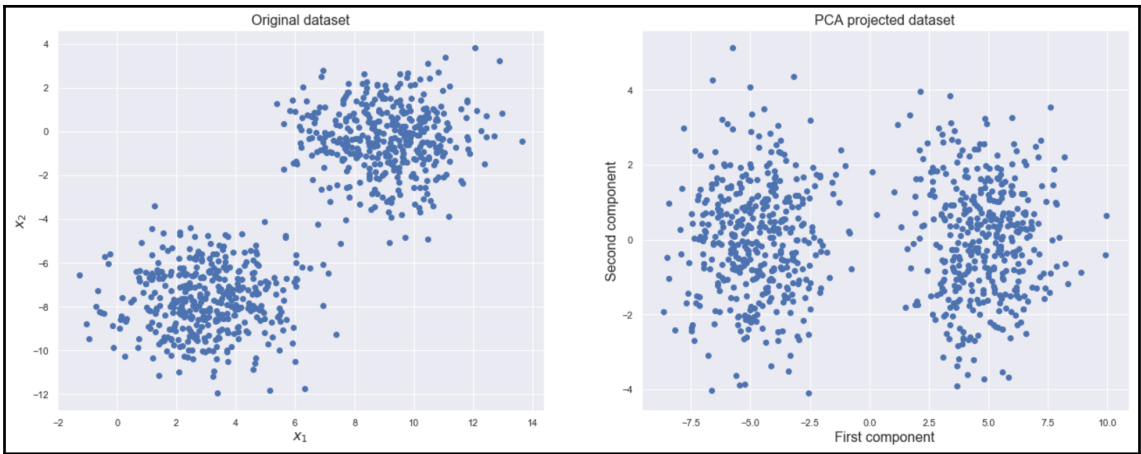
# Chapter 7: Dimensionality Reduction and Component Analysis

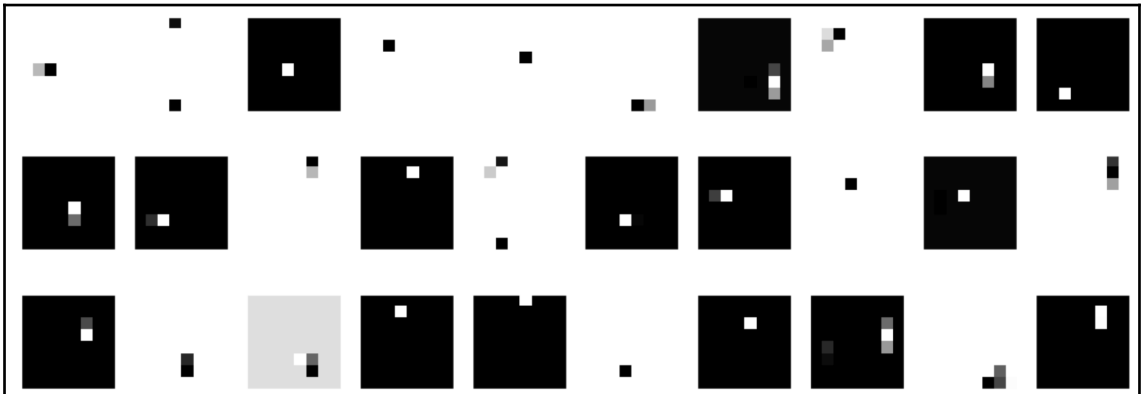
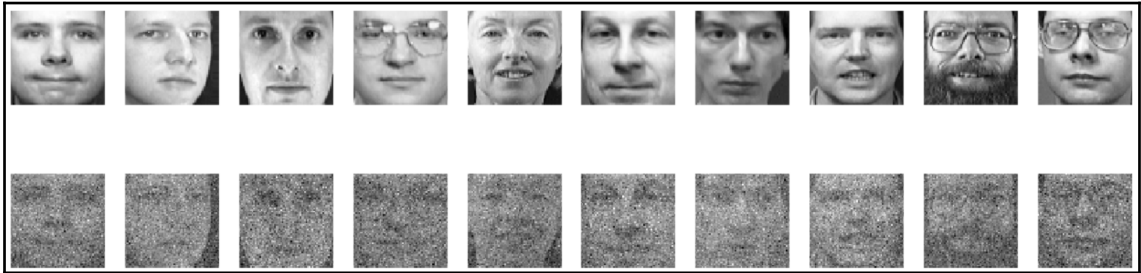
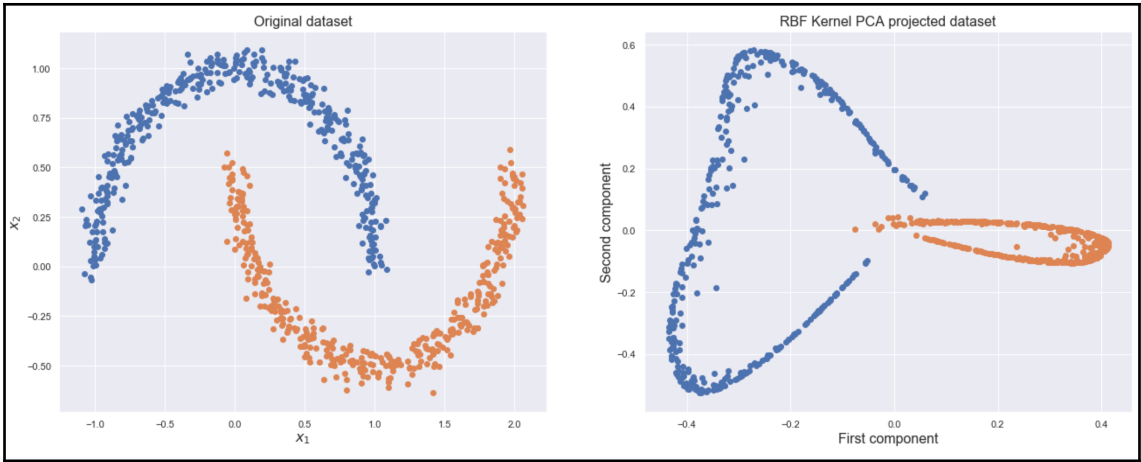


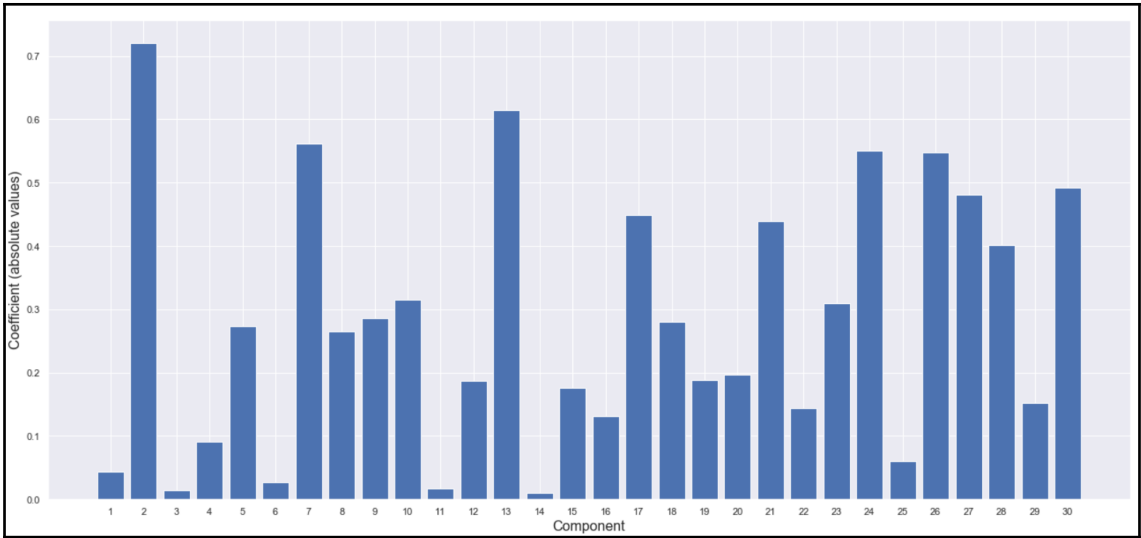


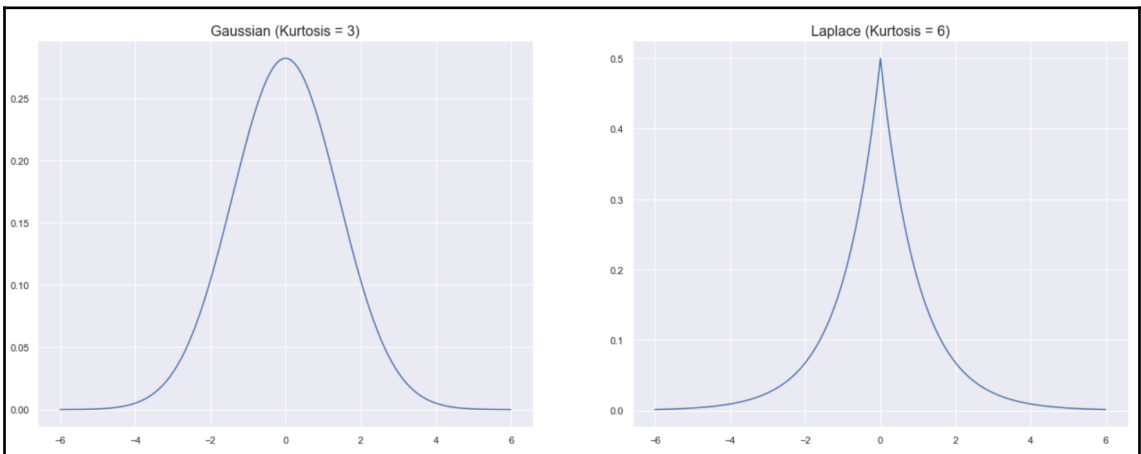
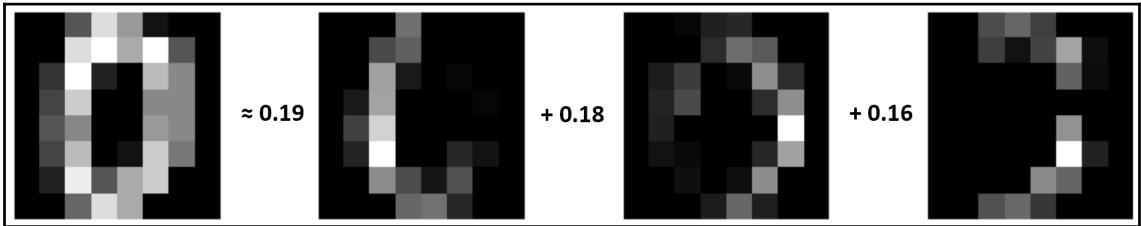
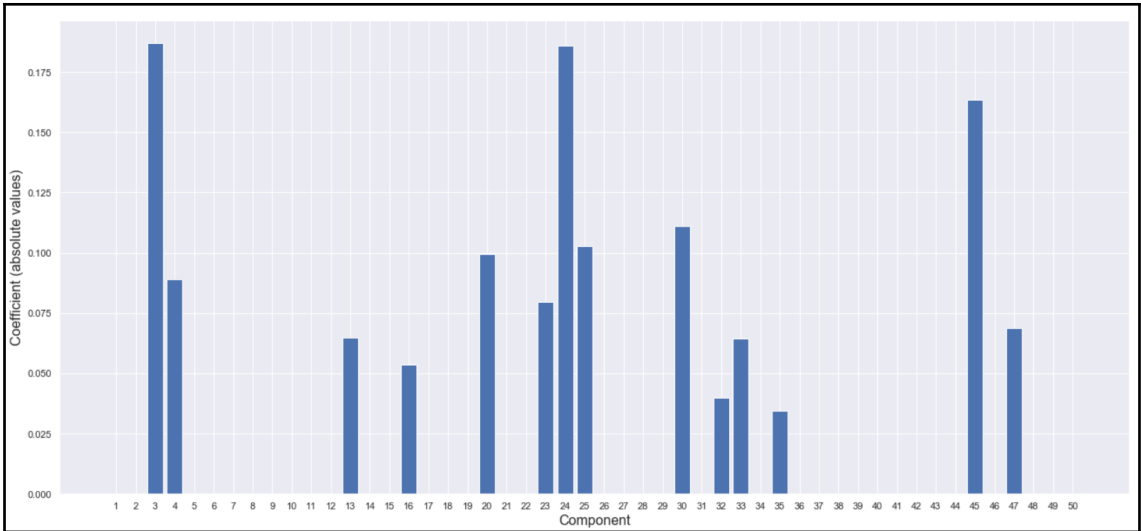


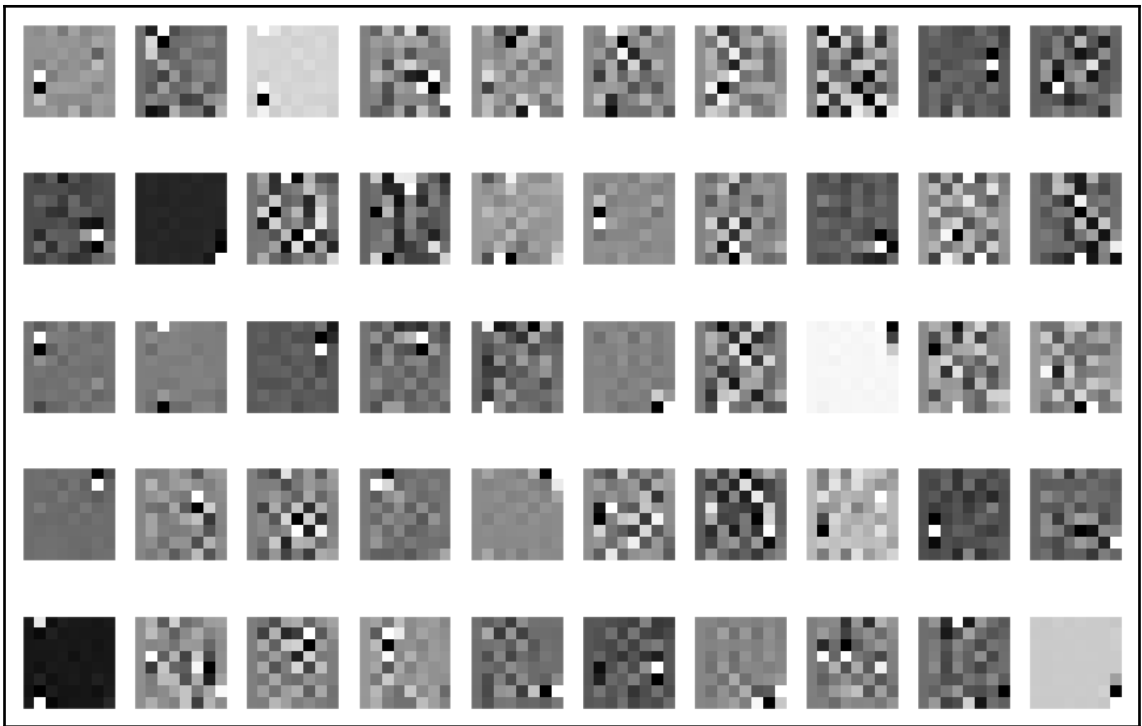


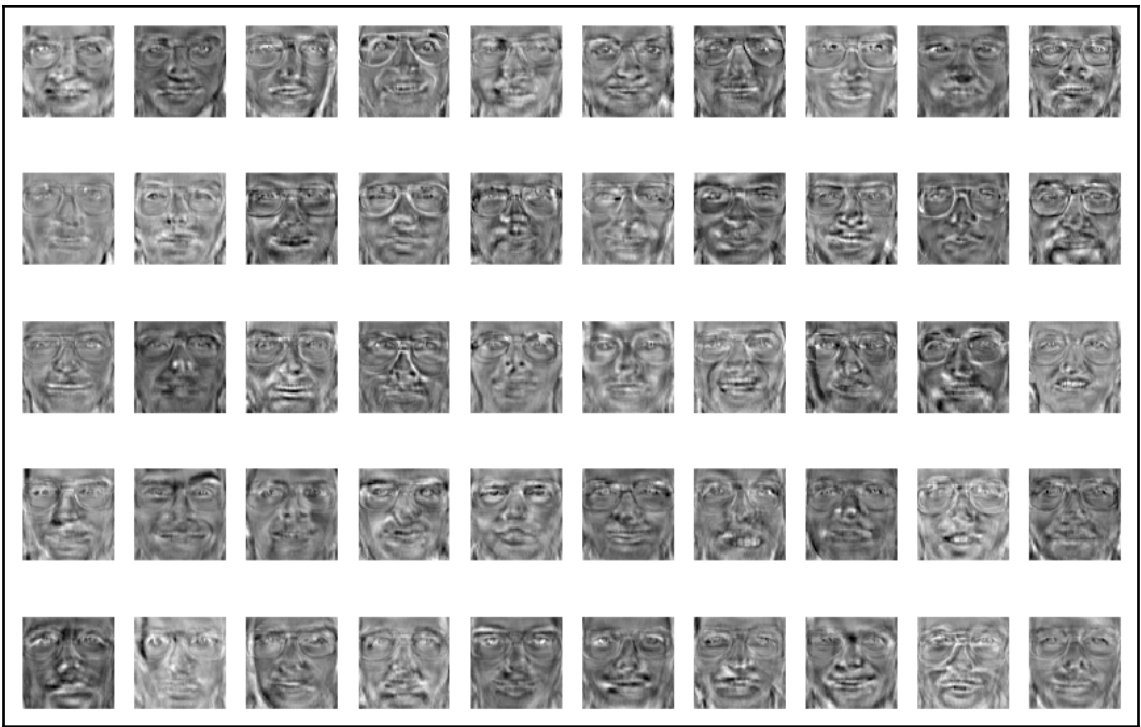




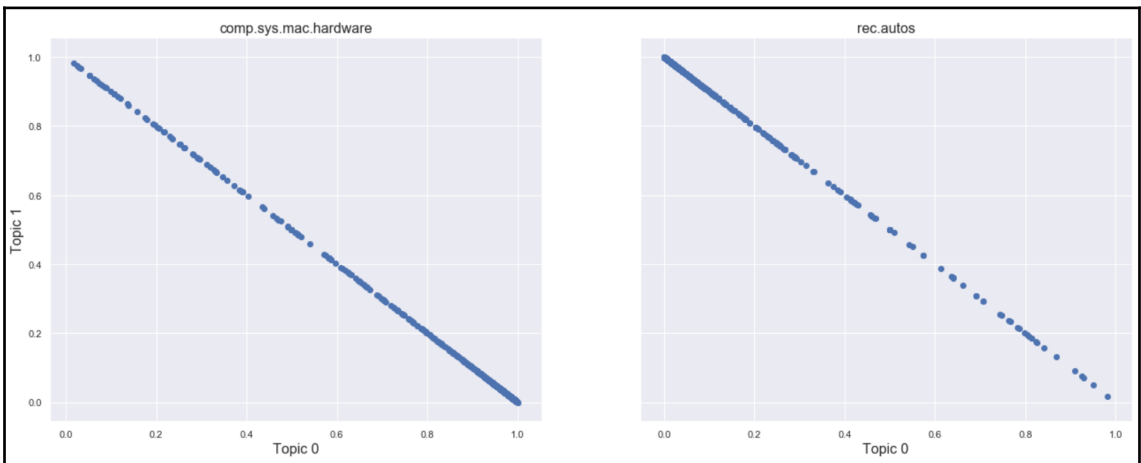
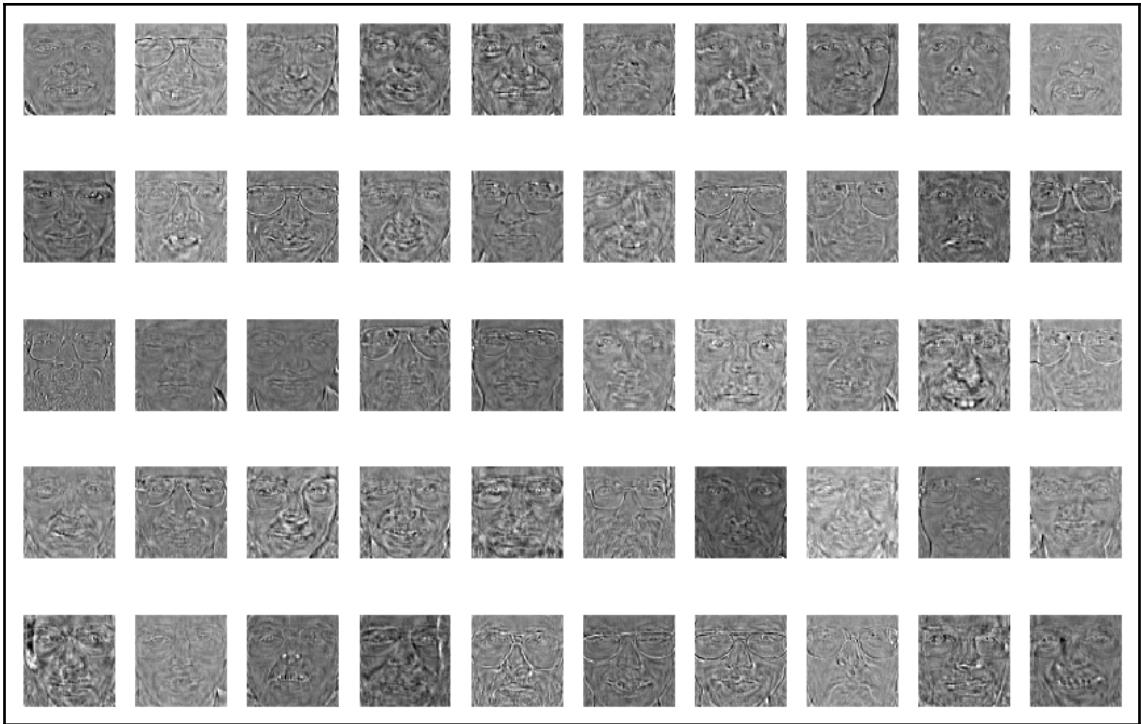






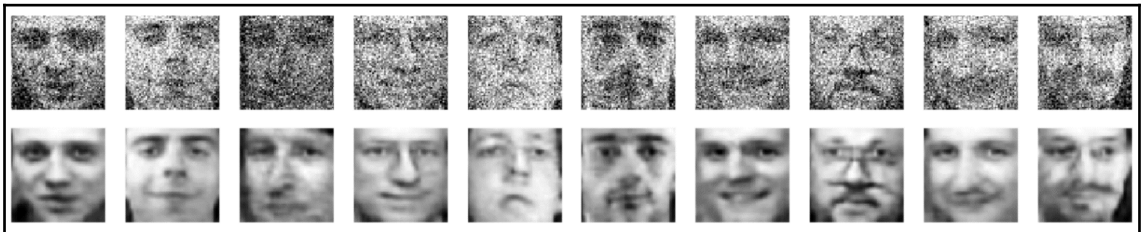
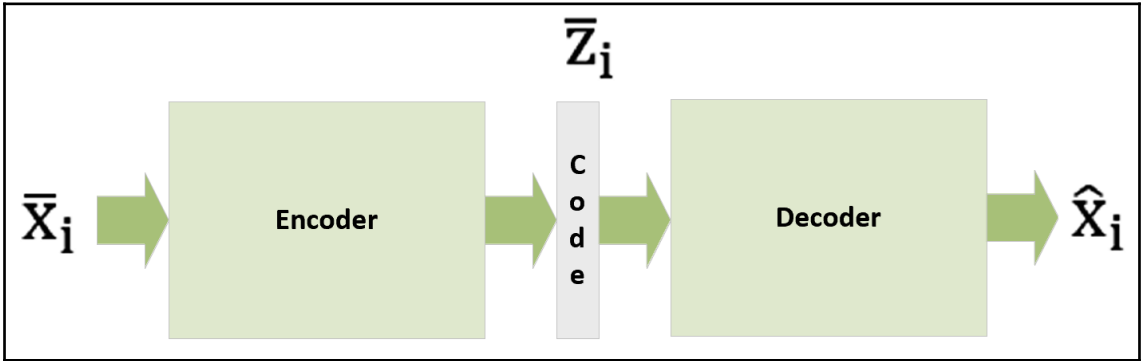


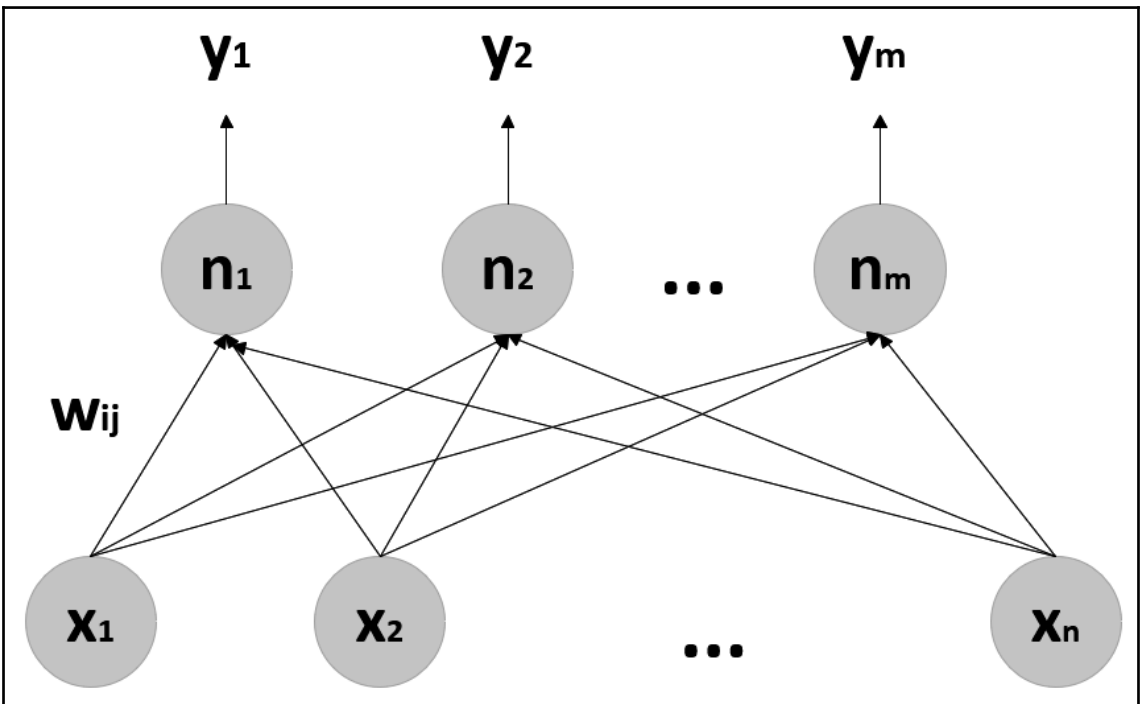
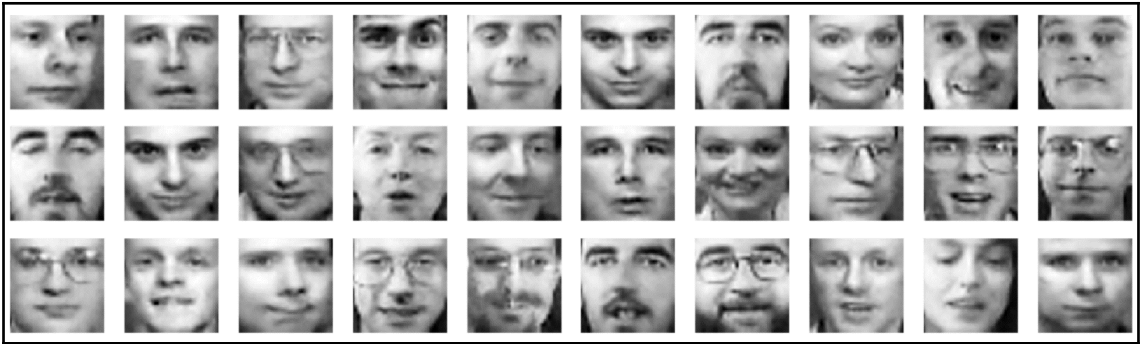


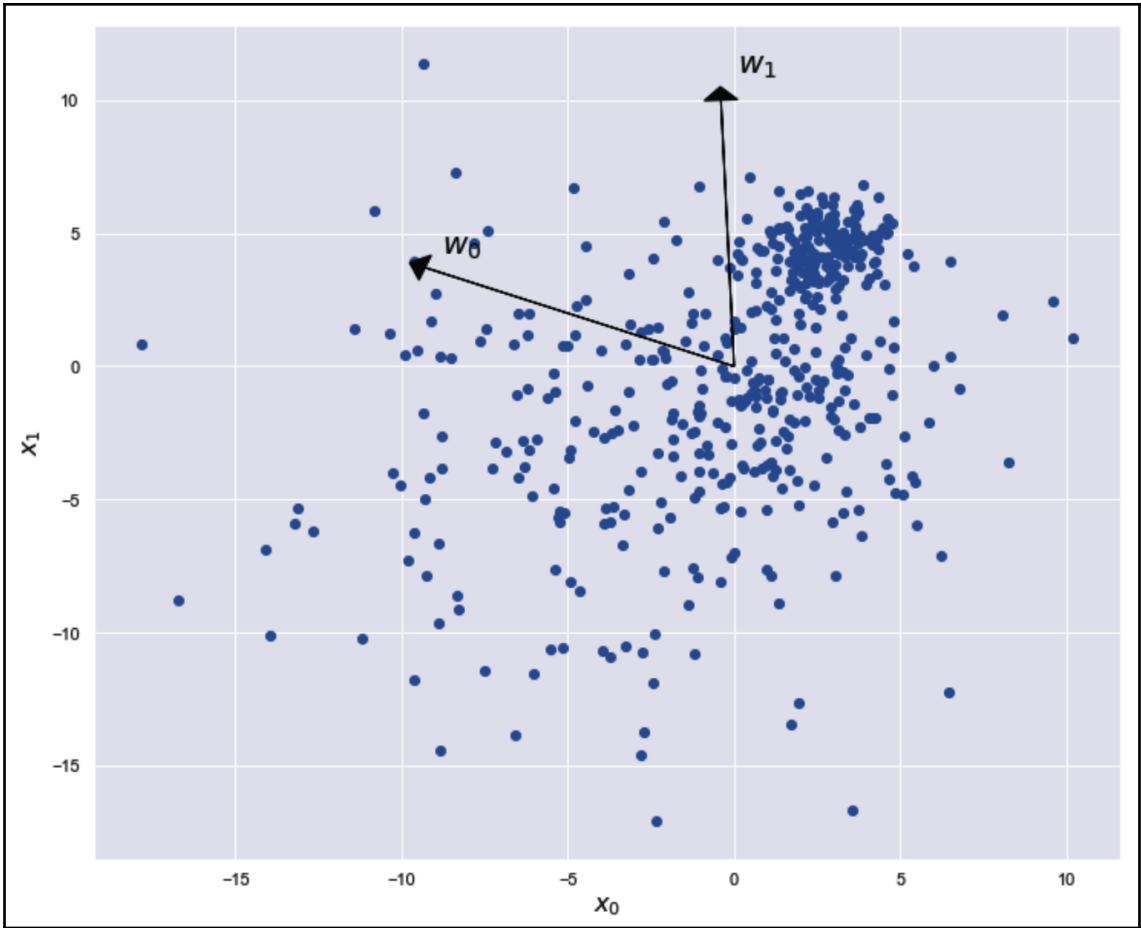


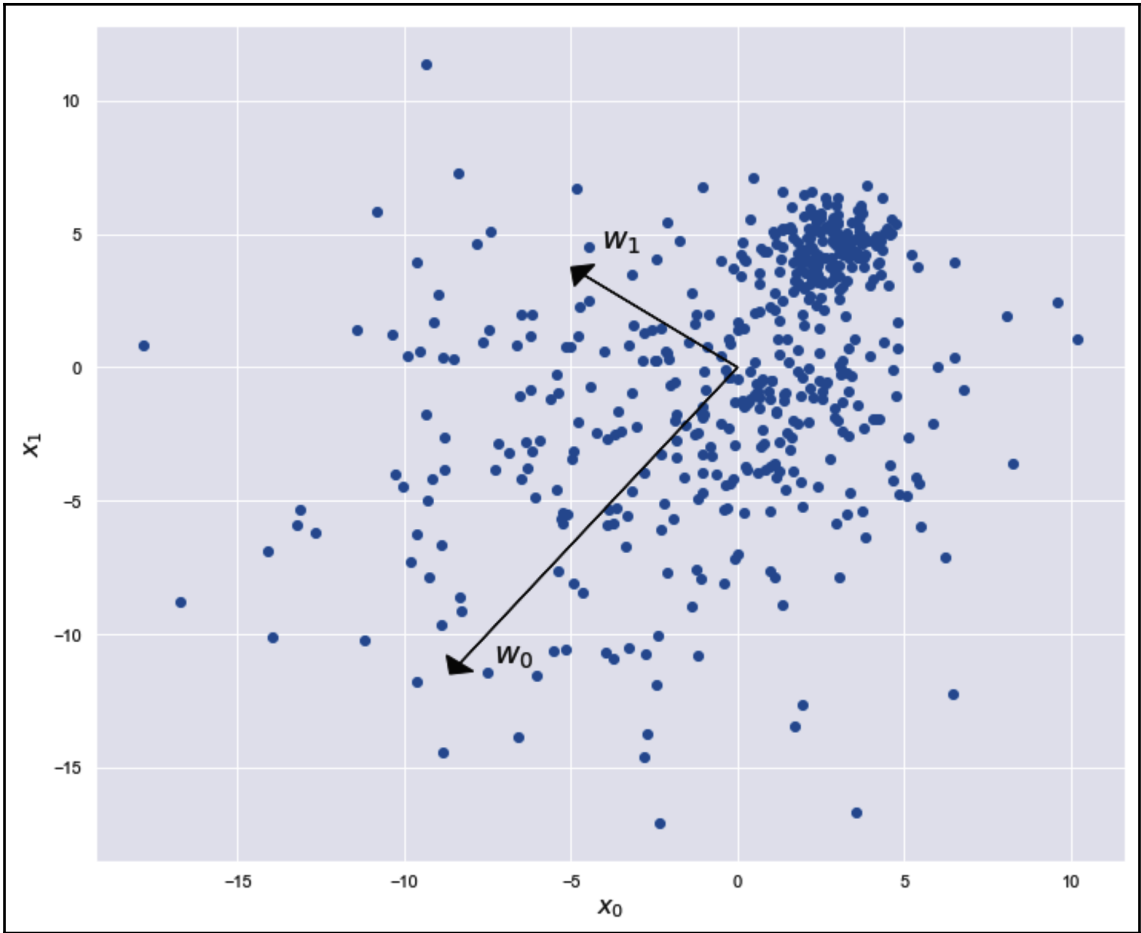
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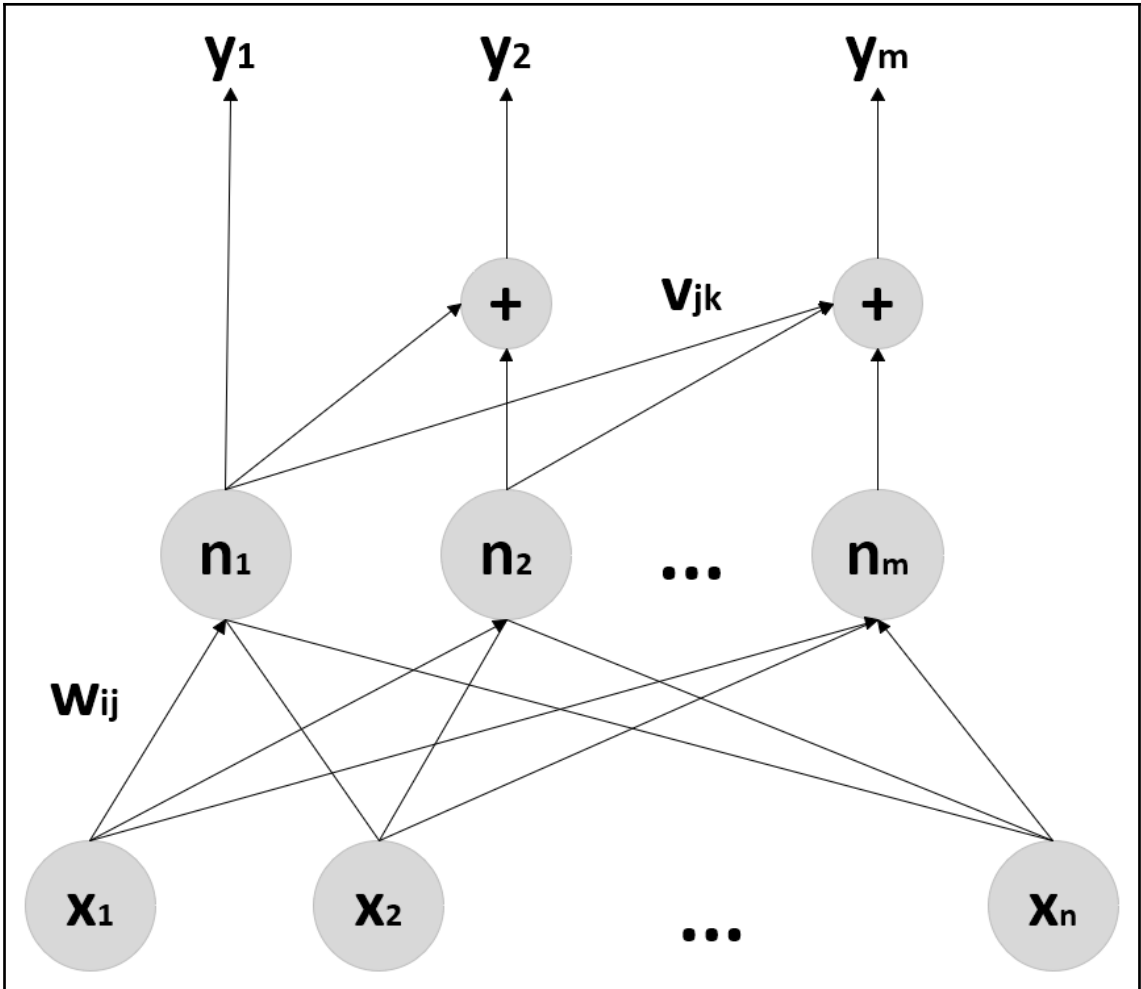
# Chapter 8: Unsupervised Neural Network Models

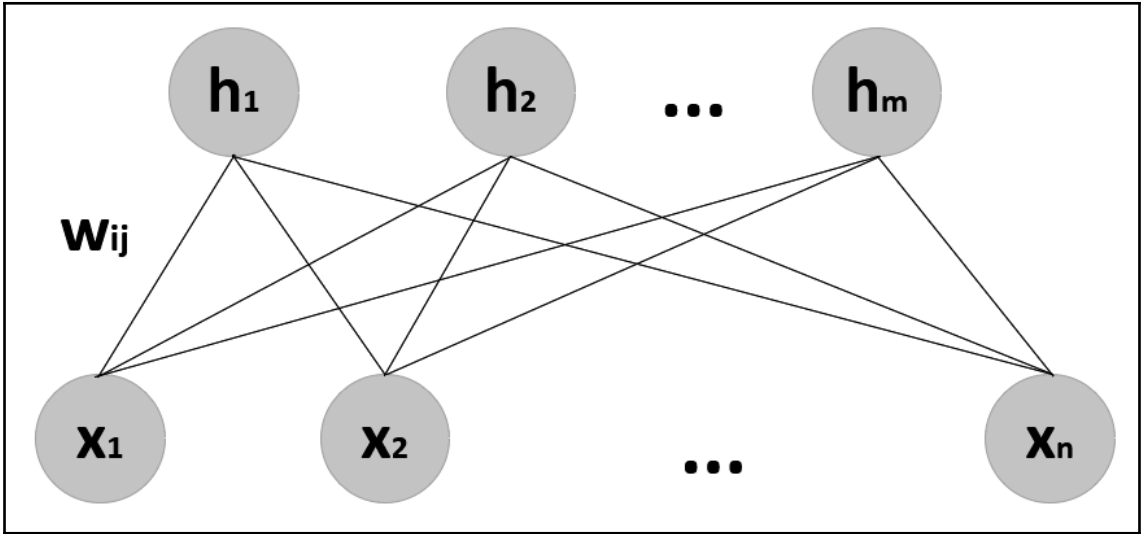


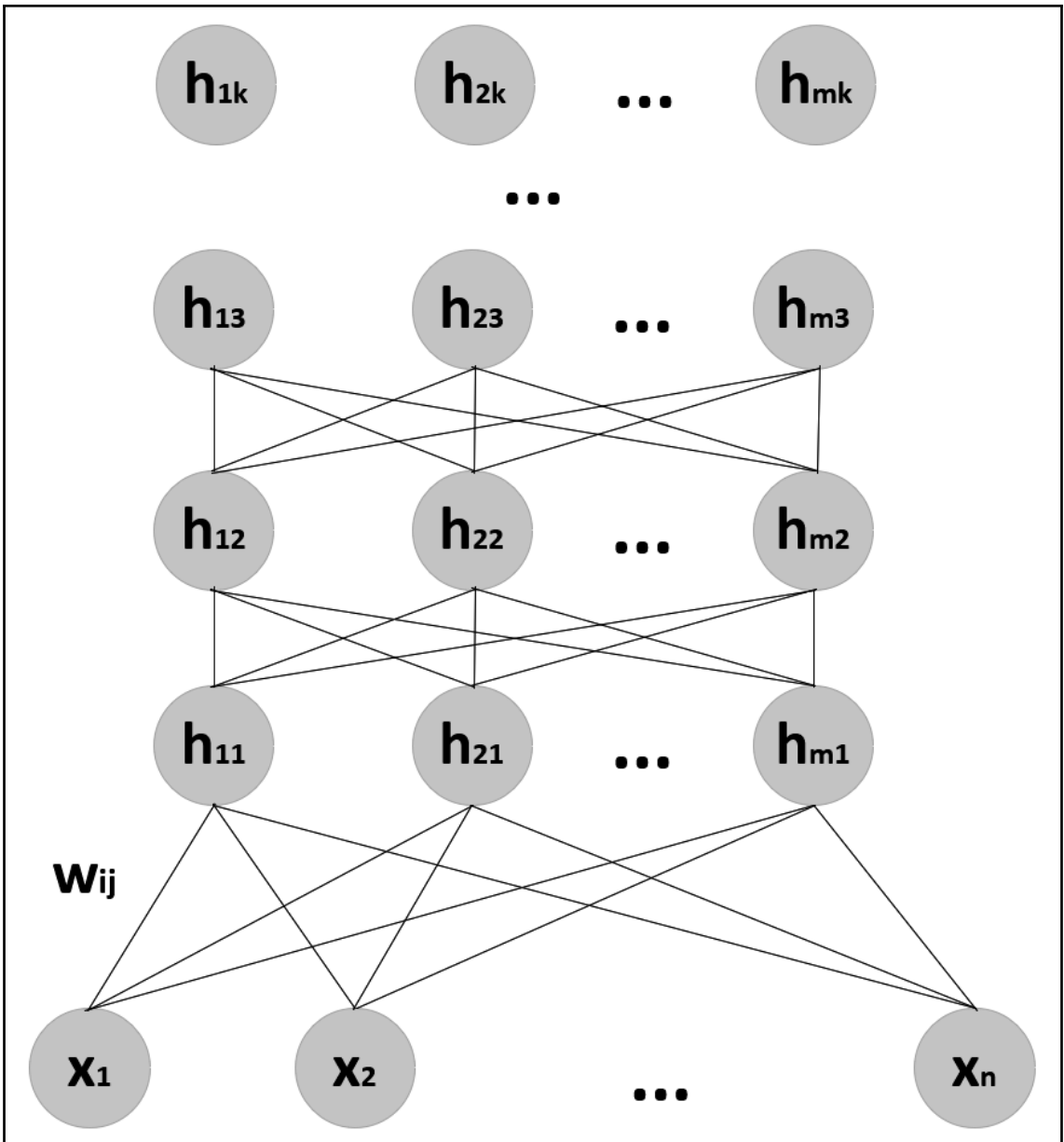




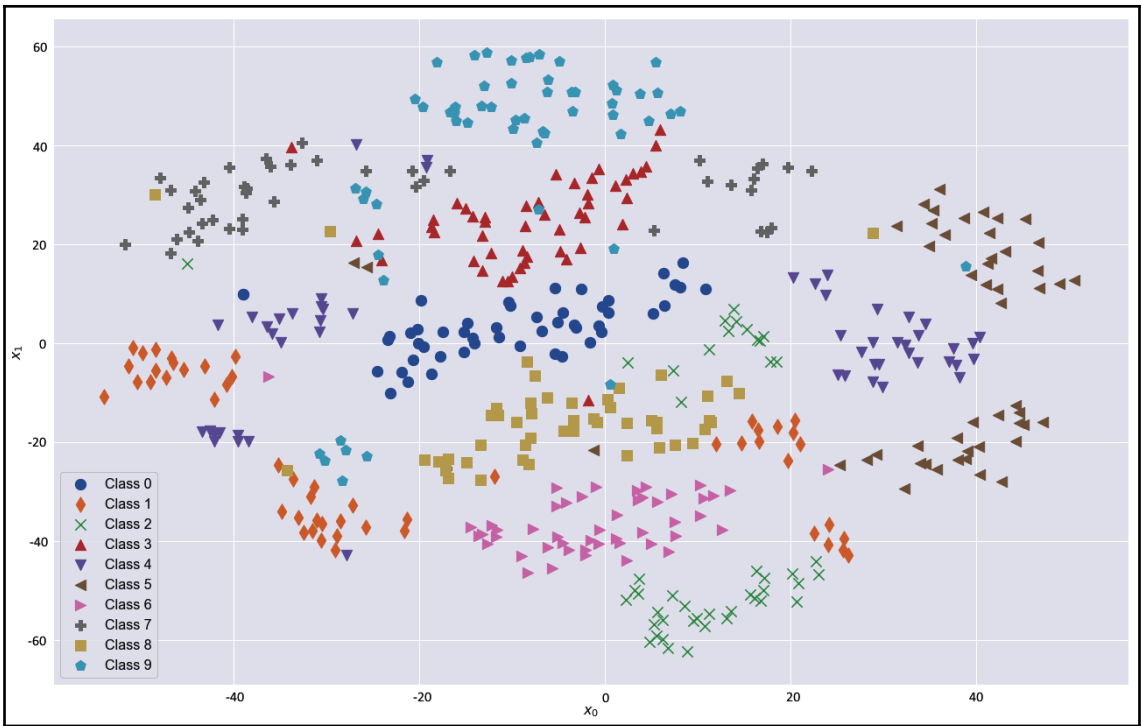












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# Chapter 9: Generative Adversarial Networks and SOMs

