

**Description :**

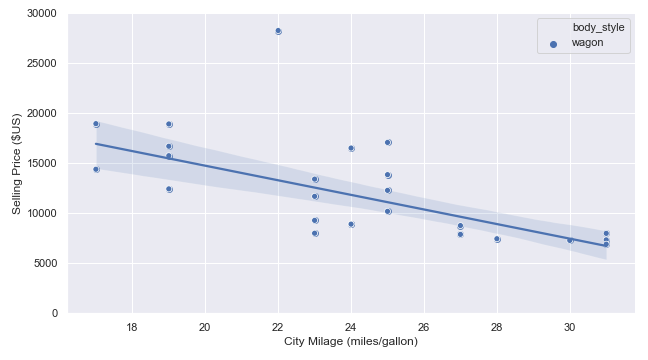
Figure showing a *robust* ***linear***fit between the selling price and the cars mileage in cities for all vehicle types.

**Sources:**

Simple\_regression\_example\_using\_parametric\_and\_non\_parametric\_methods.ipynb

Parametric fit (Linear fit) all cars.png

**------------------------------------------------------------------------------------------------------------------------------------------**



**Description :**

Figure showing a *robust* ***linear*** fit between the selling price and the cars mileage in cities for wagon vehicles only.

**Sources:**

Simple\_regression\_example\_using\_parametric\_and\_non\_parametric\_methods.ipynb

Parametric fit (Linear fit) wagon cars.png

**------------------------------------------------------------------------------------------------------------------------------------------**

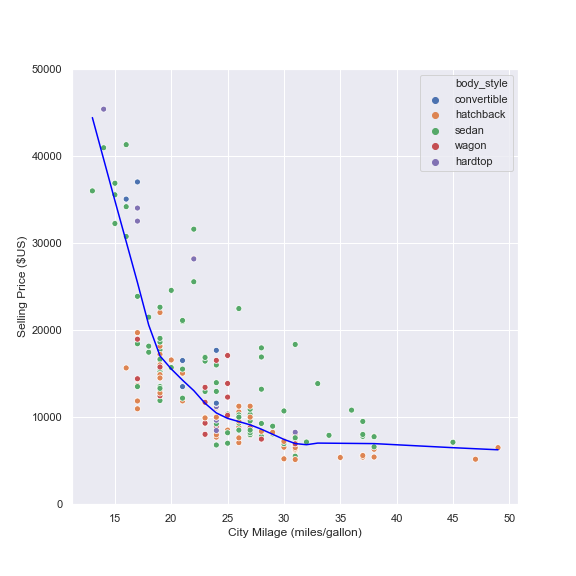
**Description :**

Figure showing a *robust* ***non-linear*** fit between the selling price and the cars mileage in cities for all vehicle types.

**Sources:**

Simple\_regression\_example\_using\_parametric\_and\_non\_parametric\_methods.ipynb

Non-parametric fit (LOWESS) all cars.png



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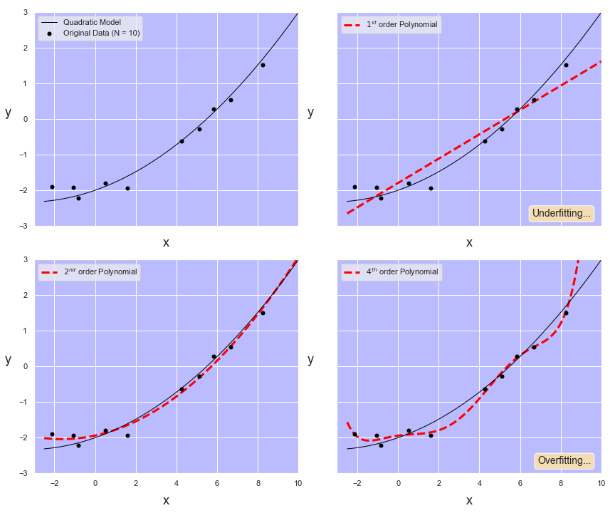
**Description :**

Figure showing the effect of polynomial order on fits with a **small** dataset and a **small** noise level.

**Sources:**

genere\_regression\_examples\_with\_polynomial\_of various\_orders.ipynb

Polynomial\_fits\_with\_small\_N\_and\_small\_sigma.png



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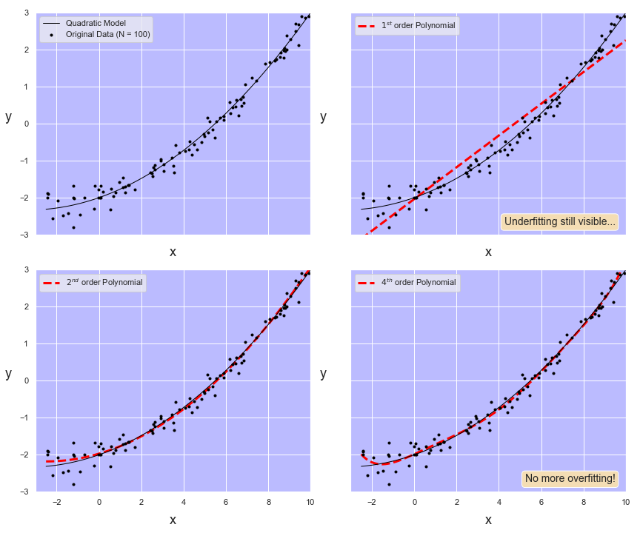
**Description :**

Figure showing the effect of polynomial order on fits with a **large** dataset and a **small** noise level.

**Sources:**

genere\_regression\_examples\_with\_polynomial\_of various\_orders.ipynb

Polynomial\_fits\_with\_large\_N\_and\_small\_sigma.png



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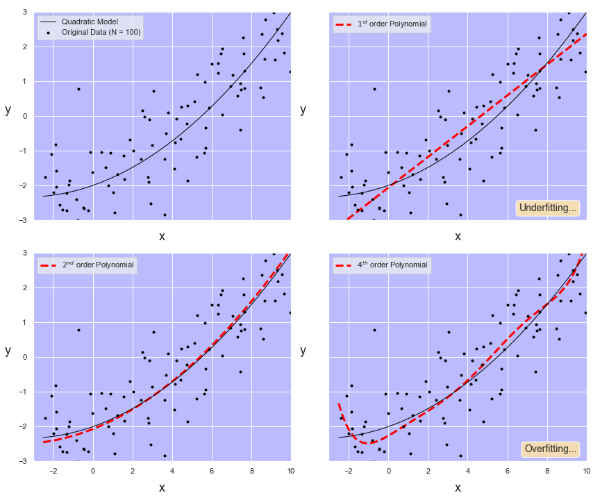
**Description :**

Figure showing the effect of polynomial order on fits with a **large** dataset and a **large** noise level.

**Sources:**

genere\_regression\_examples\_with\_polynomial\_of various\_orders.ipynb

Polynomial\_fits\_with\_large\_N\_and\_large\_sigma.png



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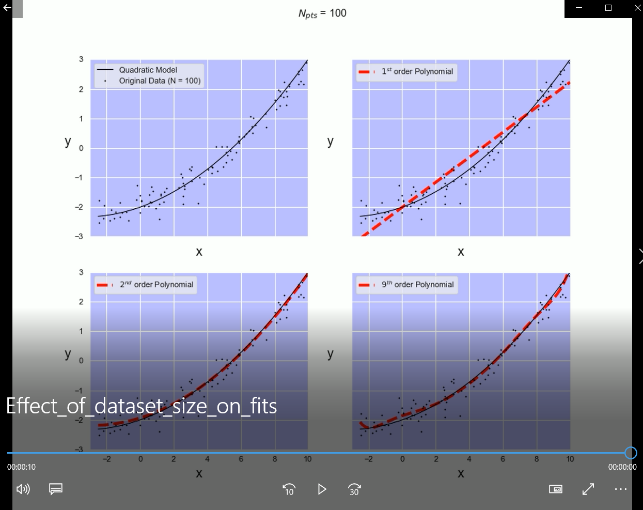
**Description :**

Video showing the effect of polynomial order on fits with a **large** dataset and a **small** noise level.

**Sources:**

genere\_regression\_examples\_with\_polynomial\_of various\_orders.ipynb

Effect\_of\_dataset\_size\_on\_fits.avi



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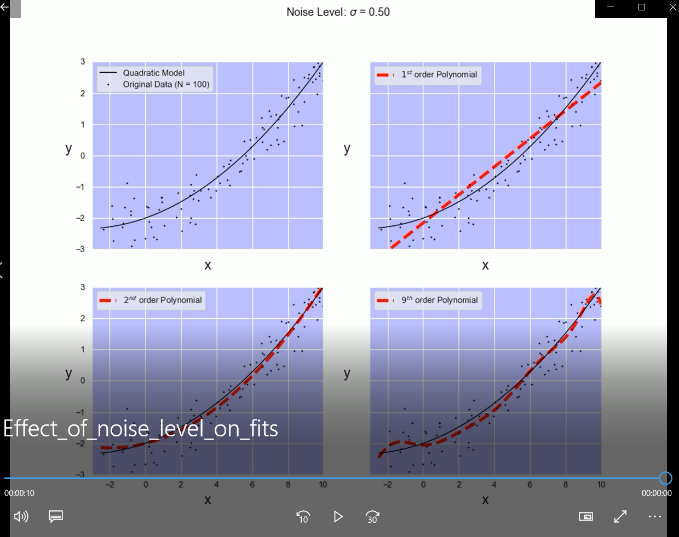
**Description :**

Video showing the effect of noise level on fits with a **large** dataset.

**Sources:**

genere\_regression\_examples\_with\_polynomial\_of various\_orders.ipynb

Effect\_of\_noise\_level\_on\_fits.avi



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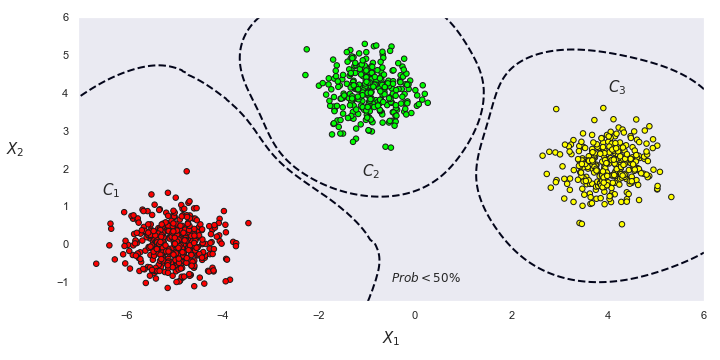
**Description :**

Figure the 50% boundaries for the maximum *a posteriori* probability 𝑃(𝐶𝑖|𝑋)P(Ci|X).

**Sources:**

example\_of\_bayesian\_classification.ipynb

Bayesian classification, 50% contours.png



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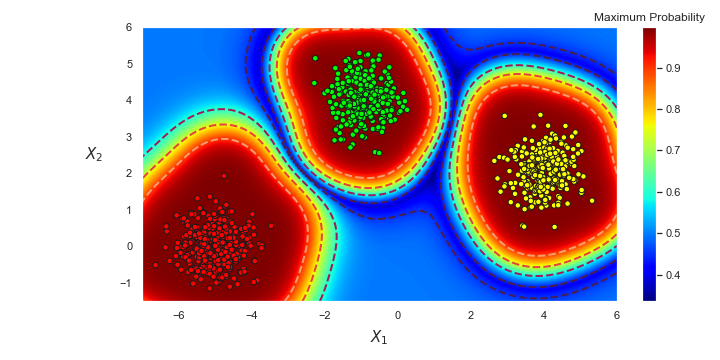
**Description :**

Figure showing the maximum value of the local *a posteriori* probabilities 𝑃(𝐶𝑖|𝑋)P(Ci|X).

**Sources:**

example\_of\_bayesian\_classification.ipynb

Bayesian classification, maximum probabilities.png



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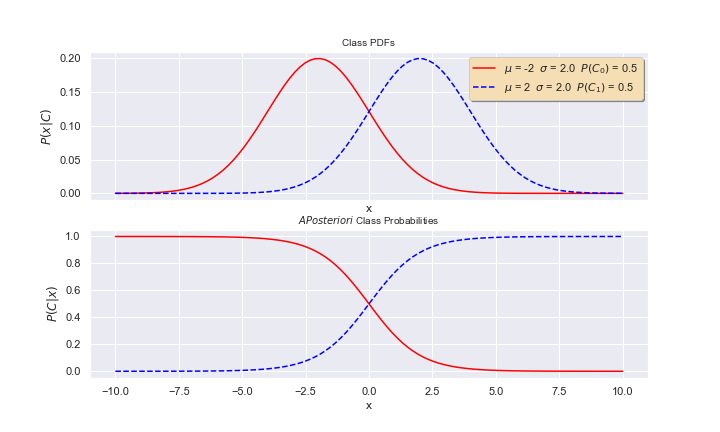
**Description :**

Easy 1-D example of Bayesian classification.

**Sources:**

examples\_of\_1D\_Bayesian\_classifications.ipynb

Easy 1-D Bayesian classification.png



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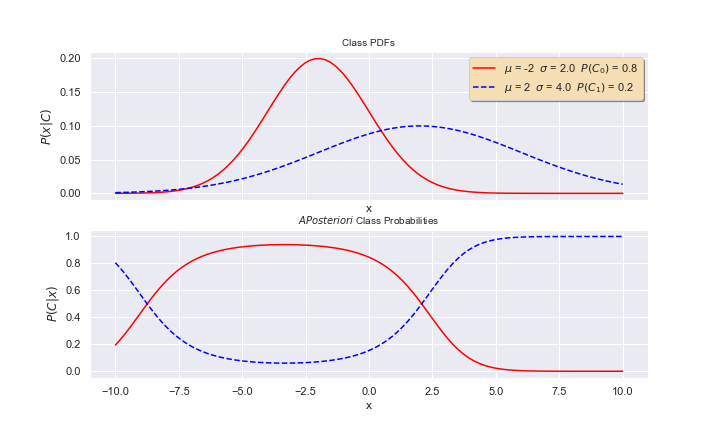
**Description :**

Hard 1-D example of Bayesian classification.

**Sources:**

examples\_of\_1D\_Bayesian\_classifications.ipynb

Hard 1-D Bayesian classification.png



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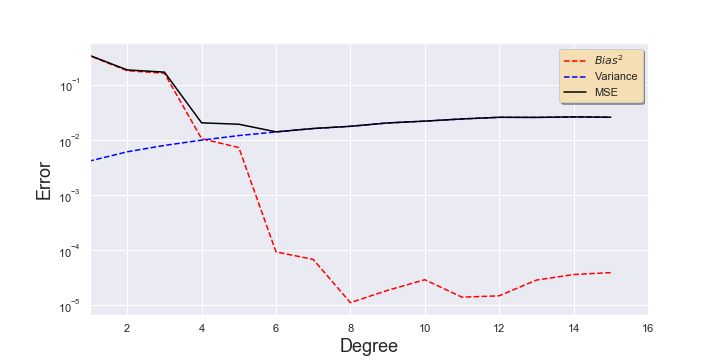
**Description :**

Explanation of the MSE, Bias and Variance relationship.

**Sources:**

show\_links\_between\_MSE\_overfitting\_and\_underfitting.ipynb

MSE\_Bias\_Variance.png



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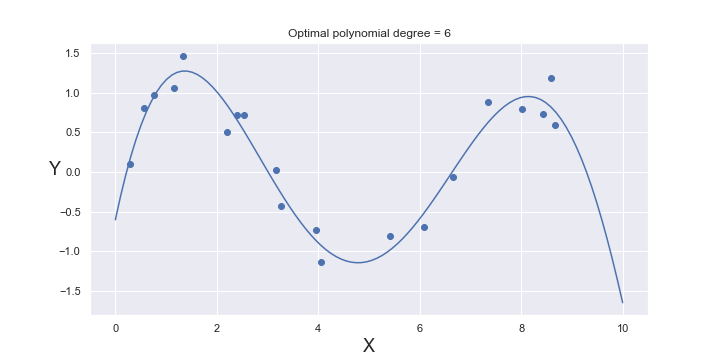
**Description :**

Optimal polynomial fit.

**Sources:**

show\_links\_between\_MSE\_overfitting\_and\_underfitting.ipynb

Optimum polynomial fit.png



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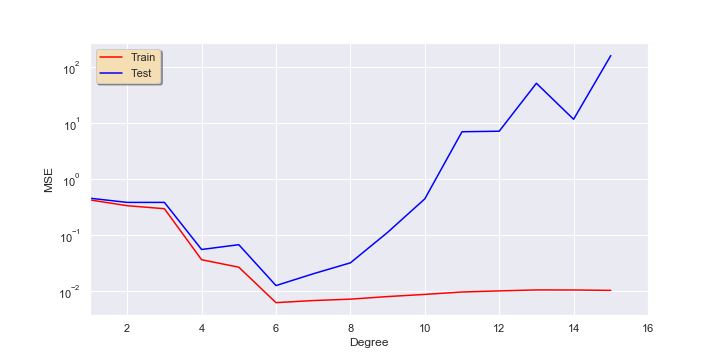
**Description :**

How does the MSE vary with polynomial degree?

**Sources:**

show\_links\_between\_MSE\_overfitting\_and\_underfitting.ipynb

MSE varies with polynomial degree.png



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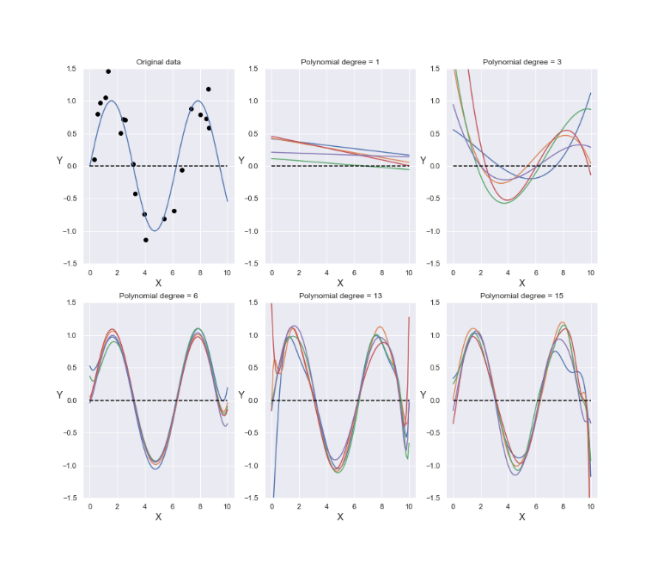
**Description :**

Various examples of polynomial fits showing bias and variability

**Sources:**

show\_links\_between\_MSE\_overfitting\_and\_underfitting.ipynb

Various examples of polynomial fits.png



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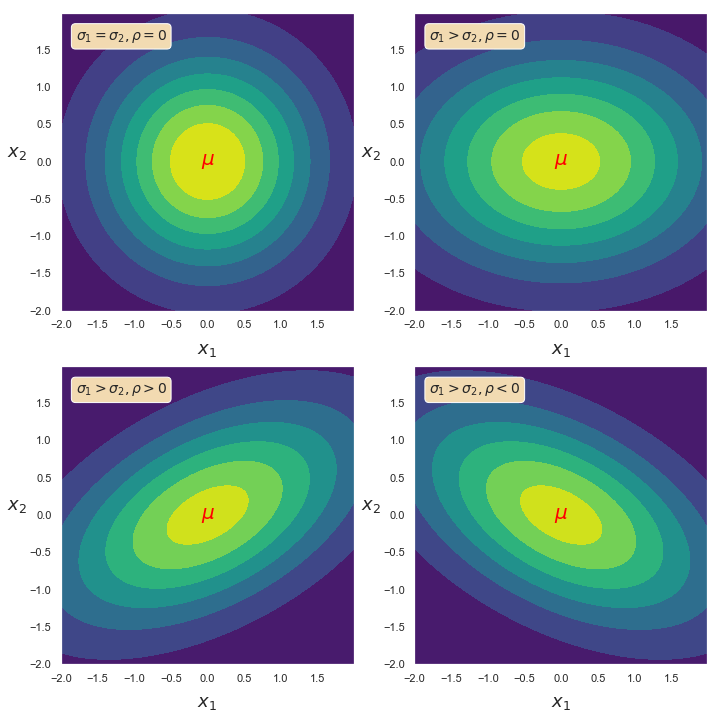
**Description :**

Examples of 2-D PDF with isotropy and correlation

**Sources:**

genere\_examples\_of\_PDF\_isotropy\_and\_correlation.ipynb

Examples\_of\_PDF\_isotropy\_and\_correlation.png



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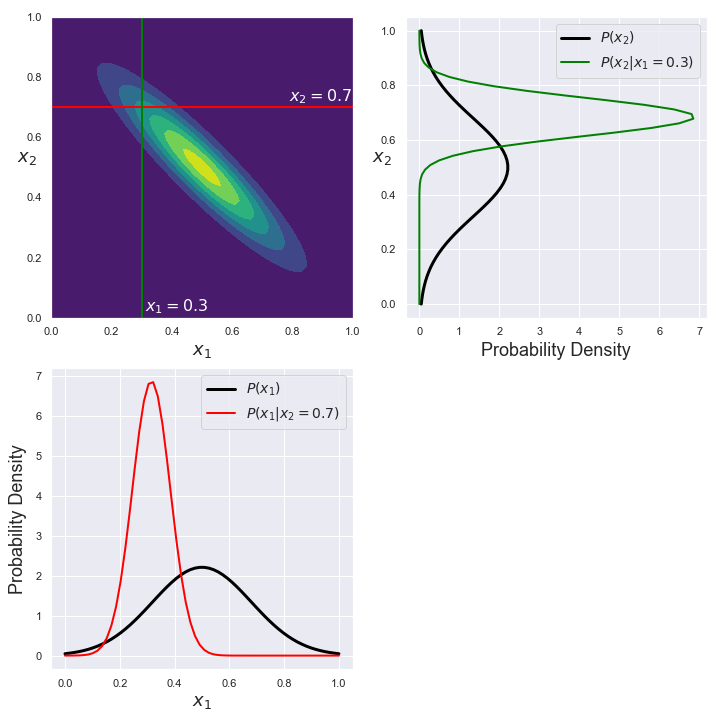
**Description :**

Example of 2D PDF with conditional 1D probabilities

**Sources:**

generate\_example\_of\_2D\_PDF\_with\_conditional\_1D\_PDF.ipynb

Example\_of\_2D\_PDF\_with\_conditional\_1D.png



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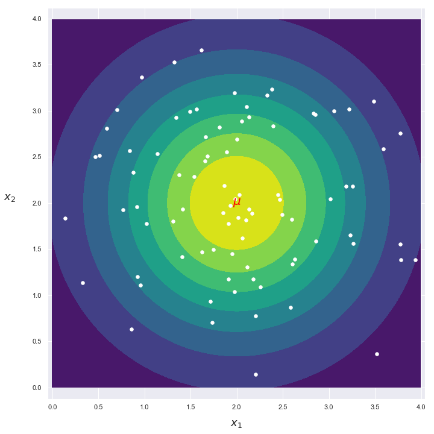
**Description :**

Example\_of\_isotropic\_2D\_gaussian\_PDF\_without\_correlation

**Sources:**

generate\_examples\_of\_2D\_gaussian\_PDF.ipynb

Example\_of\_isotropic\_2D\_gaussian\_PDF\_without\_correlation.png



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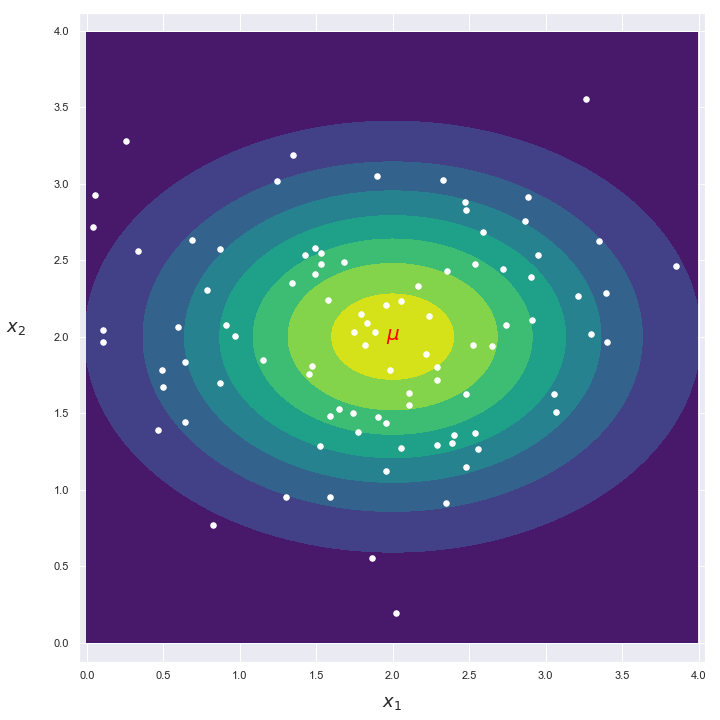
**Description :**

Example\_of\_anisotropic\_2D\_gaussian\_PDF\_without\_correlation

**Sources:**

generate\_examples\_of\_2D\_gaussian\_PDF.ipynb

Example\_of\_anisotropic\_2D\_gaussian\_PDF\_without\_correlation.png



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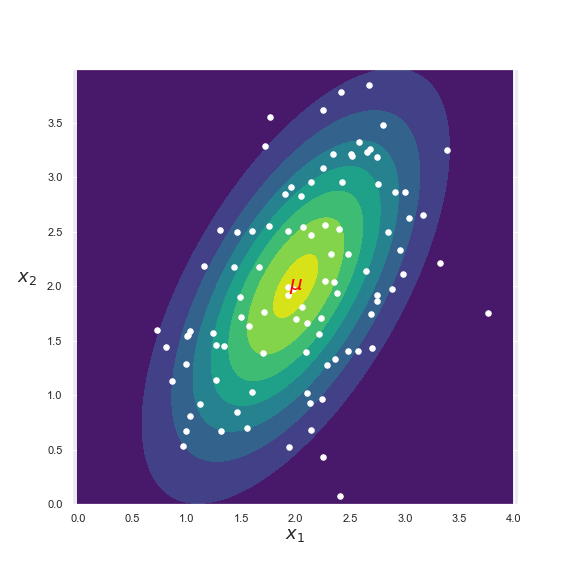
**Description :**

Example\_of\_correlated\_2D\_gaussian\_PDF

**Sources:**

generate\_examples\_of\_2D\_gaussian\_PDF.ipynb

Example\_of\_correlated\_2D\_gaussian\_PDF.png



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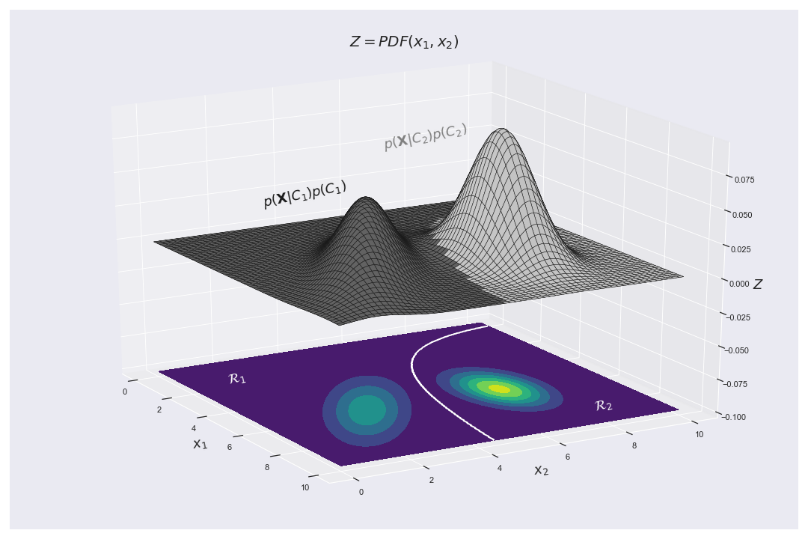
**Description :**

Explanatory diagram for influence zones in 2-class segmentation

**Sources:**

generate\_explanatory\_diagram\_for\_influence\_zones\_in\_two\_class\_segmentation.ipynb

Influence\_zones\_in\_gaussian\_PDF\_classification.png



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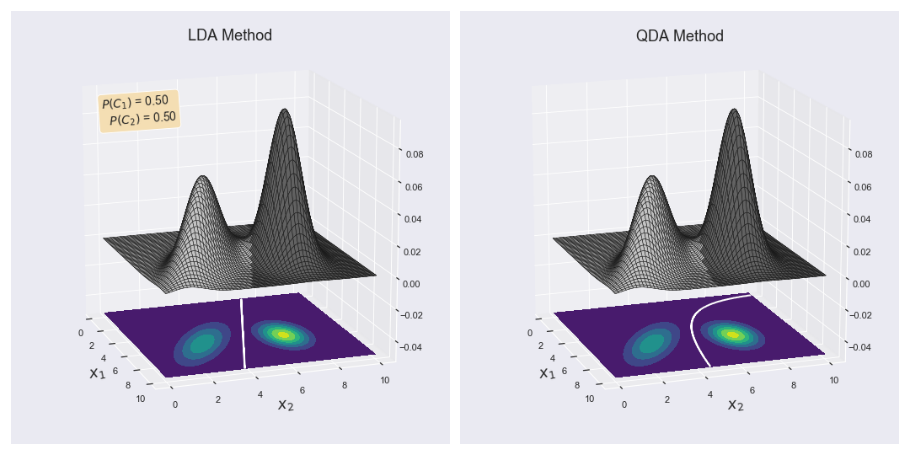
**Description :**

Generate surface classification examples with LDA and QDA methods

**Sources:**

Generate\_surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

Surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods.png



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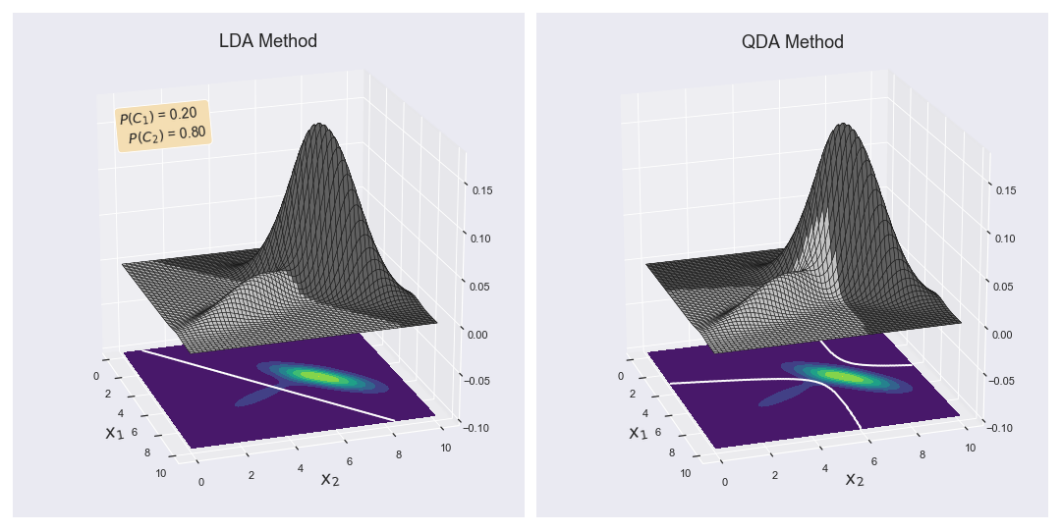
**Description :**

Generate surface classification examples with LDA and QDA methods; P(C1)=20%, P(C2)=80%

**Sources:**

Generate\_surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

Surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods\_20%\_80%.png



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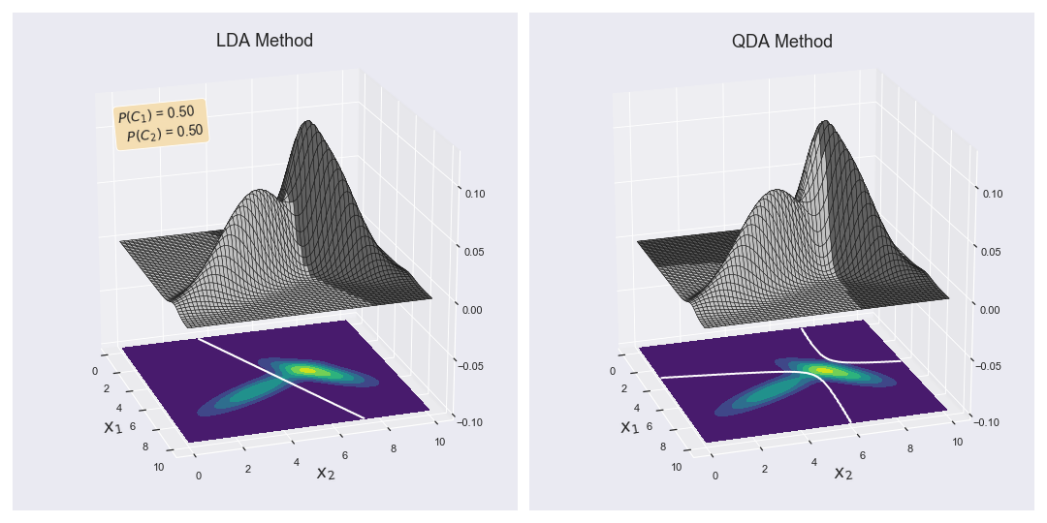
**Description :**

Generate surface classification examples with LDA and QDA methods; P(C1)=50%, P(C2)=50%

**Sources:**

Generate\_surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

Surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods\_50%\_50%.png



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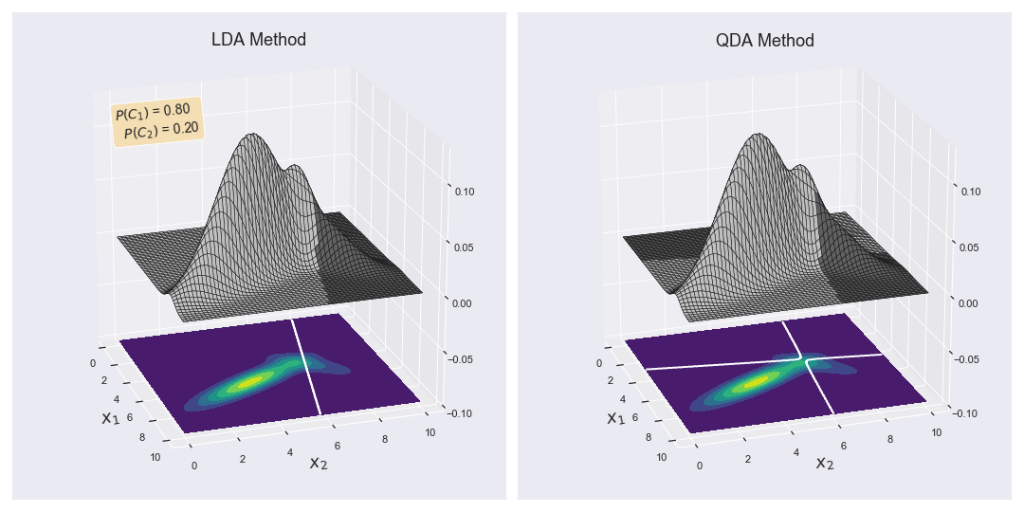
**Description :**

Generate surface classification examples with LDA and QDA methods; P(C1)=80%, P(C2)=20%

**Sources:**

Generate\_surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

Surface\_classification\_examples\_with\_LDA\_and\_QDA\_methods\_80%\_20%.png



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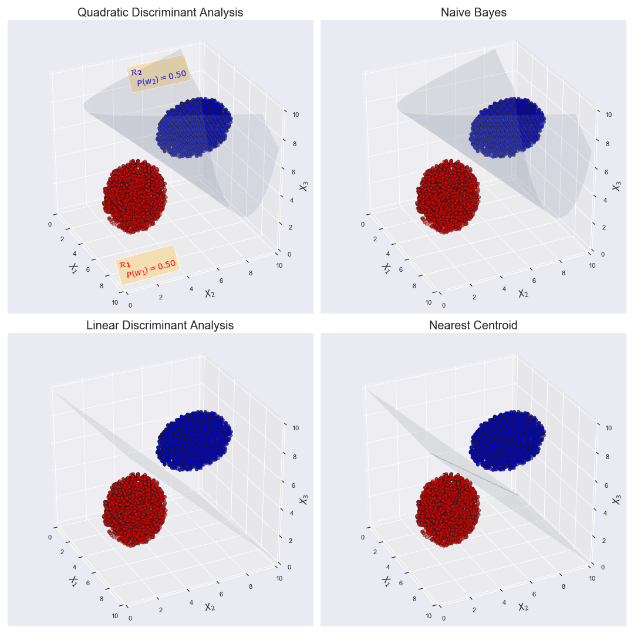
**Description :**

**Different distributions with the same *a priori* probability**𝑃(𝐶𝑖)=50%

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_1.png



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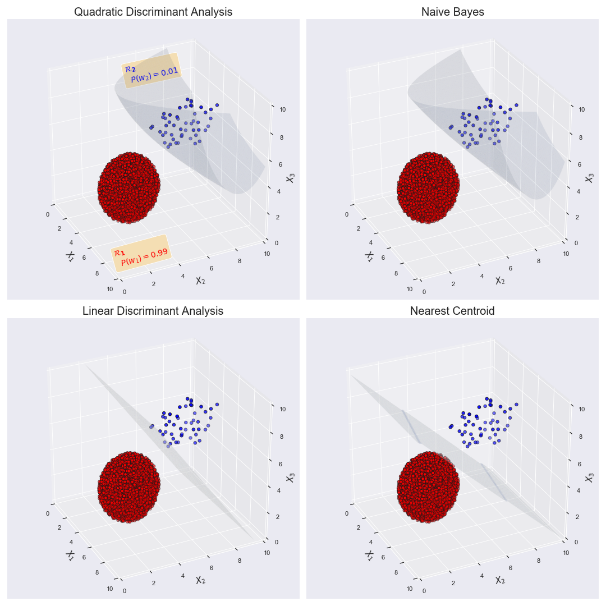
**Description :**

**Different distributions with very different *a priori* probabilities**𝑃(𝐶𝑖)

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_2.png



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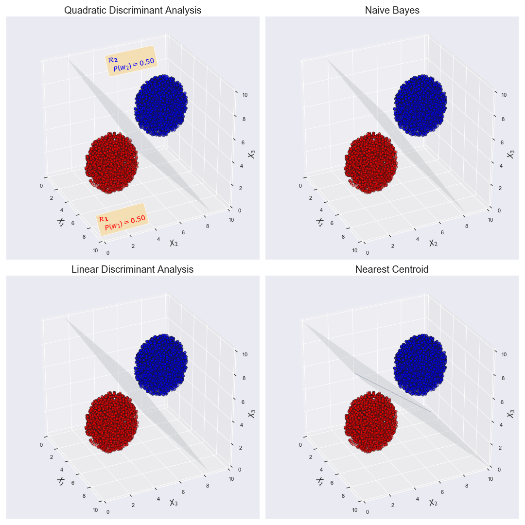
**Description :**

**Identical distributions with the same *a priori* probability**𝑃(𝐶𝑖)=50%

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_3.png



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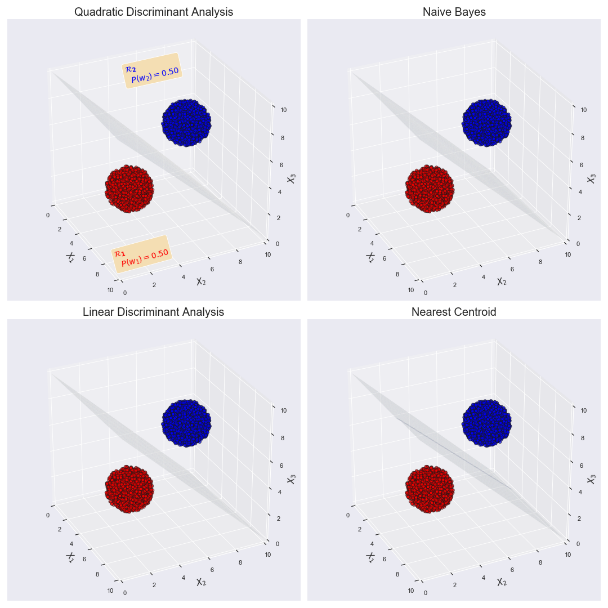
**Description :**

### Identical spherical distributions with the same *a priori* probability 𝑃(𝐶𝑖)=50%

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_4.png



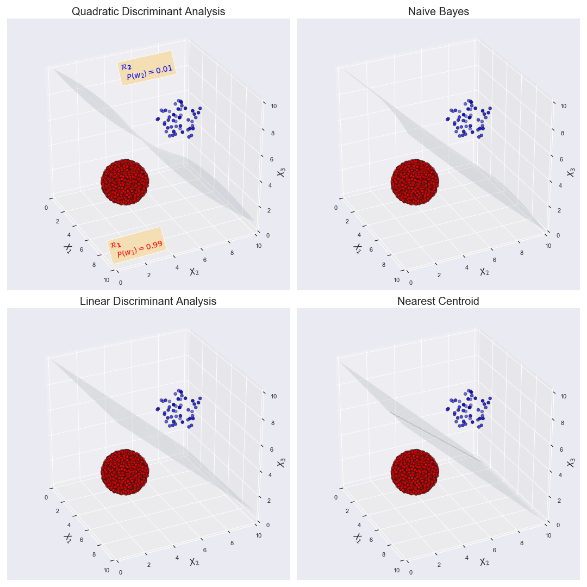
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

**Identical spherical distributions with very different *a priori* probabilities**𝑃(𝐶𝑖)**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_5.png



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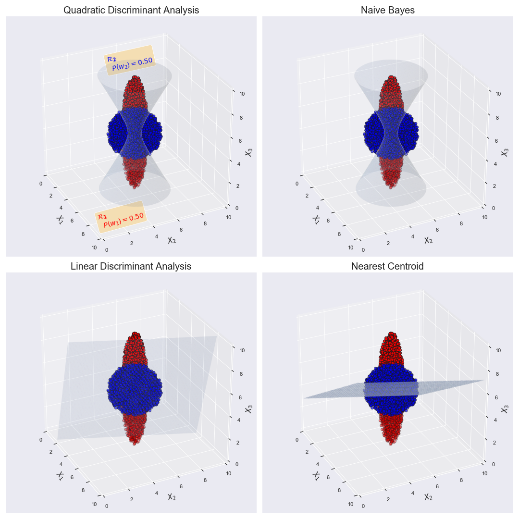
**Description :**

### Superposed spherical and ellipsoidal distributions with the same *a priori* probability 𝑃(𝐶𝑖)=50%

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_6.png



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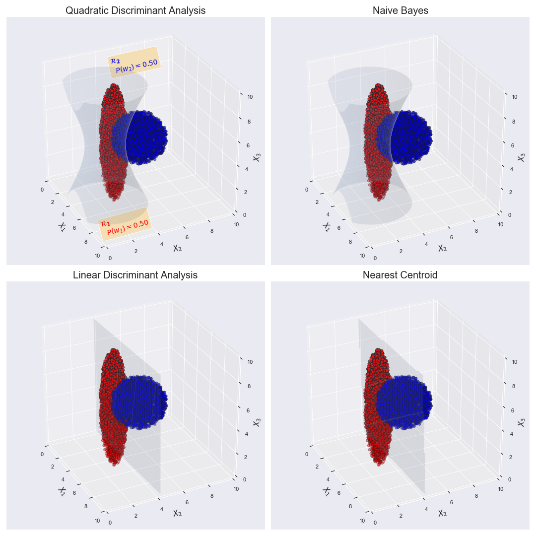
**Description :**

**Touching spherical and ellipsoidal distributions with the same *a priori* probability**𝑃(𝐶𝑖)=50%

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_7.png



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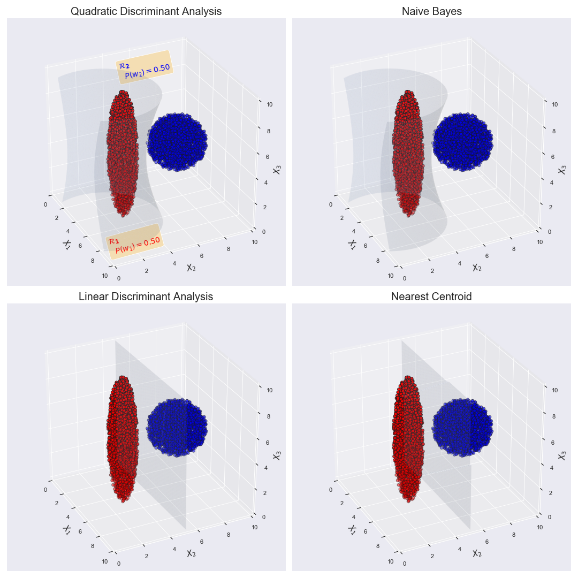
**Description :**

### Separated spherical and ellipsoidal distributions with the same *a priori* probability 𝑃(𝐶𝑖)=50%

**Sources:**

generate\_3D\_classification\_examples\_with\_LDA\_QDA\_NaiveBayes\_NearestCentroid\_methods.ipynb

3D\_classification\_4\_methods\_8.png



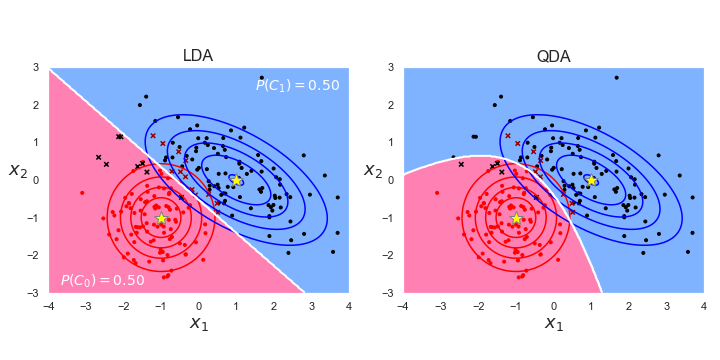
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**Description :**

**2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods:**

Generate\_2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

'Classification\_examples\_with\_LDA\_and\_QDA\_methods\_1.png



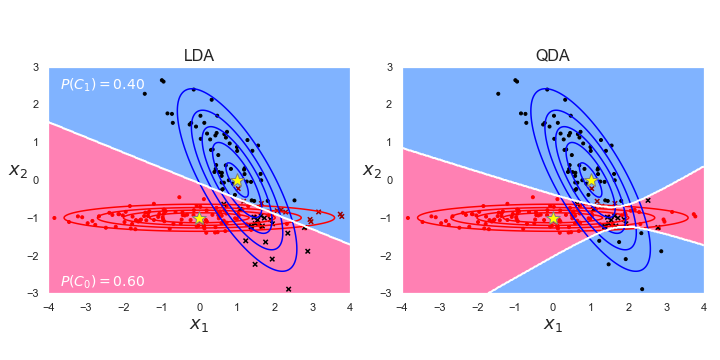
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

**2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods:**

Generate\_2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

'Classification\_examples\_with\_LDA\_and\_QDA\_methods\_2.png



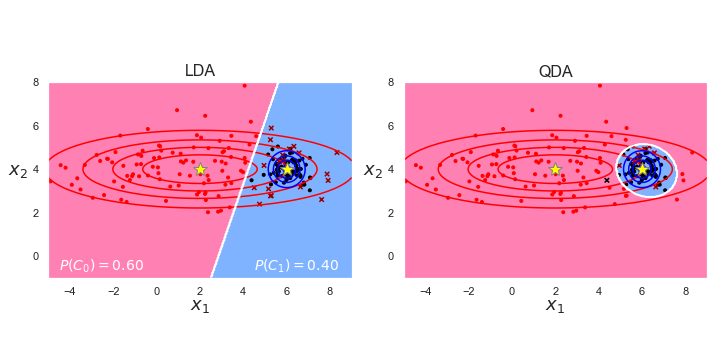
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**Description :**

**2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods:**

Generate\_2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

'Classification\_examples\_with\_LDA\_and\_QDA\_methods\_3.png



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**Description :**

**2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods:**

Generate\_2D\_classification\_examples\_with\_LDA\_and\_QDA\_methods.ipynb

'Classification\_examples\_with\_LDA\_and\_QDA\_methods\_4.png



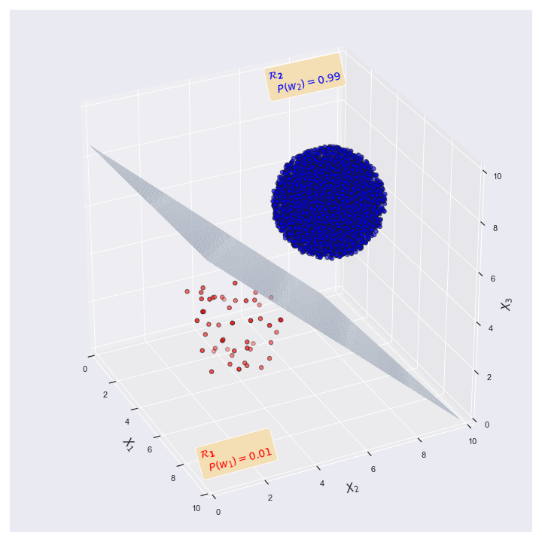
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**Description :**

**3D\_classification\_examples\_with\_LDA\_method: P(C1) = 1%**

generate\_3D\_LDA\_segmentations\_with\_influences\_zones.ipynb

3D\_LDA\_classification\_0.01.png



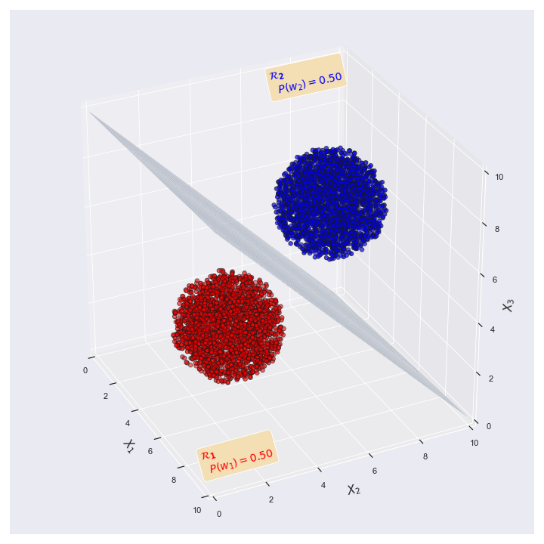
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**Description :**

**3D\_classification\_examples\_with\_LDA\_method: P(C1) = 50%**

generate\_3D\_LDA\_segmentations\_with\_influences\_zones.ipynb

3D\_LDA\_classification\_0.50.png



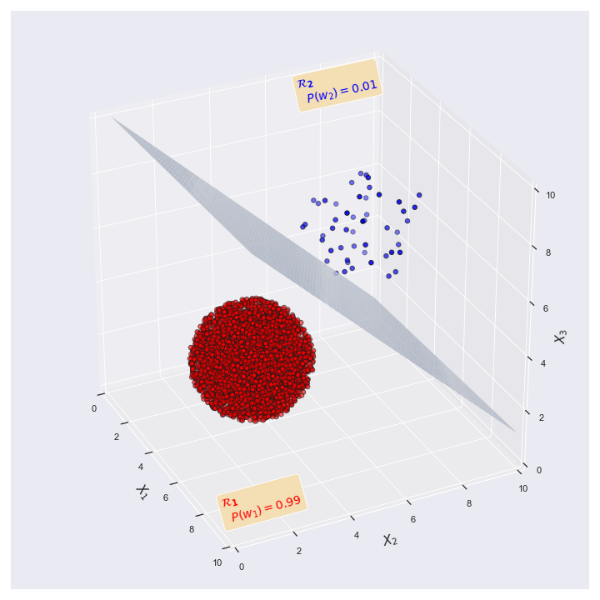
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**Description :**

**3D\_classification\_examples\_with\_LDA\_method: P(C1) = 99%**

generate\_3D\_LDA\_segmentations\_with\_influences\_zones.ipynb

3D\_LDA\_classification\_0.99.png



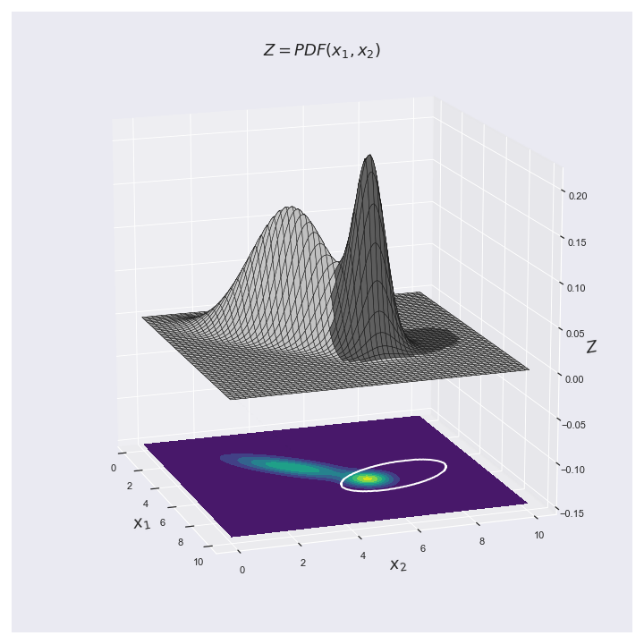
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**Description :**

**QDA classification results for 2 gaussian PDF generated with 100 data points**

effect\_of\_number\_of\_data\_points\_on\_classification\_results.ipynb

Classification\_results\_for\_2\_gaussian\_PDF\_generated\_with\_100\_data\_points.png



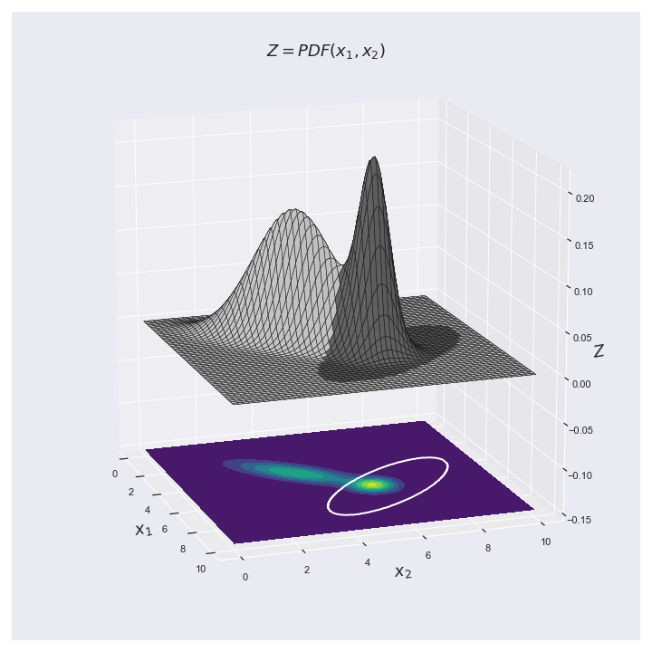
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**Description :**

**QDA classification results for 2 gaussian PDF generated with 1000 data points**

effect\_of\_number\_of\_data\_points\_on\_classification\_results.ipynb

Classification\_results\_for\_2\_gaussian\_PDF\_generated\_with\_1000\_data\_points.png



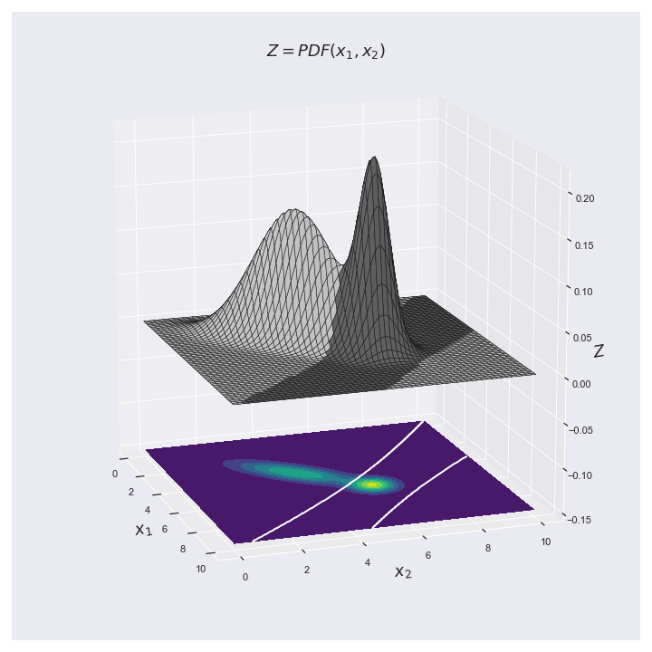
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**Description :**

**QDA classification results for 2 gaussian PDF generated with 10, 000 data points**

effect\_of\_number\_of\_data\_points\_on\_classification\_results.ipynb

Classification\_results\_for\_2\_gaussian\_PDF\_generated\_with\_10K\_data\_points.png



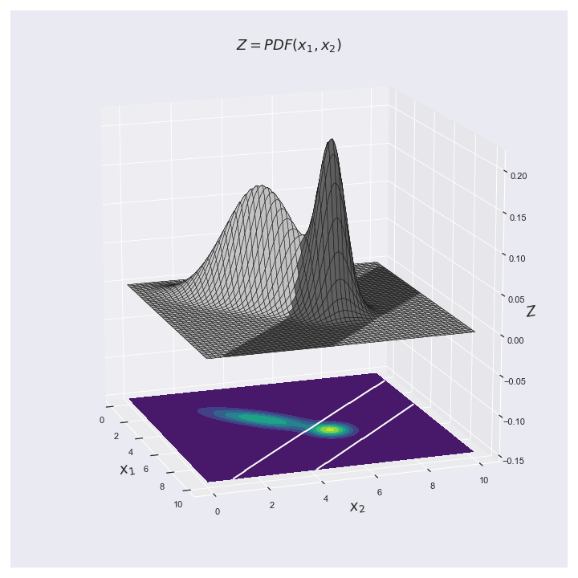
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**Description :**

**QDA classification results for 2 gaussian PDF generated with 100, 000 data points**

effect\_of\_number\_of\_data\_points\_on\_classification\_results.ipynb

Classification\_results\_for\_2\_gaussian\_PDF\_generated\_with\_100K\_data\_points.png



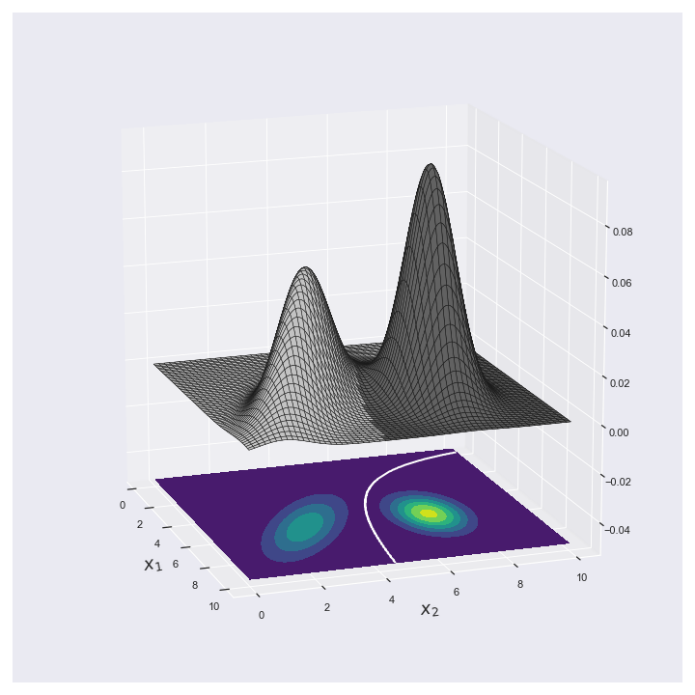
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

# **Various examples of 2-D classification using QDA**

Detailed\_example\_of\_QDA\_classification.ipynb

Various\_2D\_classification\_examples\_with\_quadratic\_discriminant\_1.png



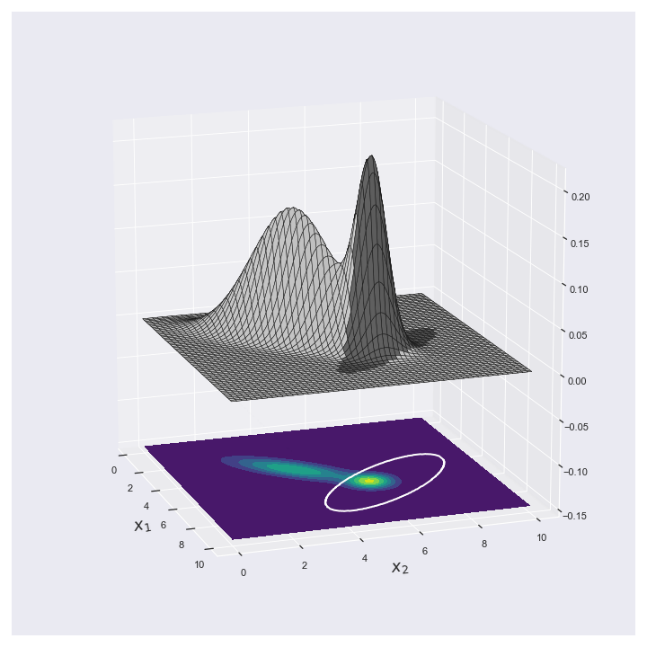
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**Description :**

# **Various examples of 2-D classification using QDA**

Detailed\_example\_of\_QDA\_classification.ipynb

Various\_2D\_classification\_examples\_with\_quadratic\_discriminant\_2.png



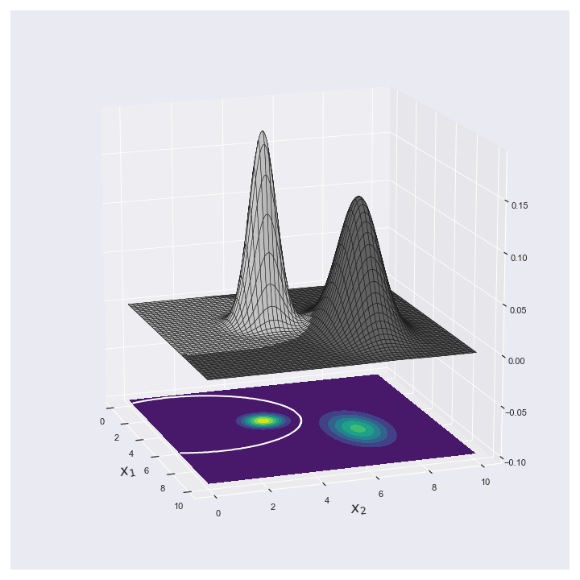
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**Description :**

# **Various examples of 2-D classification using QDA**

Detailed\_example\_of\_QDA\_classification.ipynb

Various\_2D\_classification\_examples\_with\_quadratic\_discriminant\_3.png



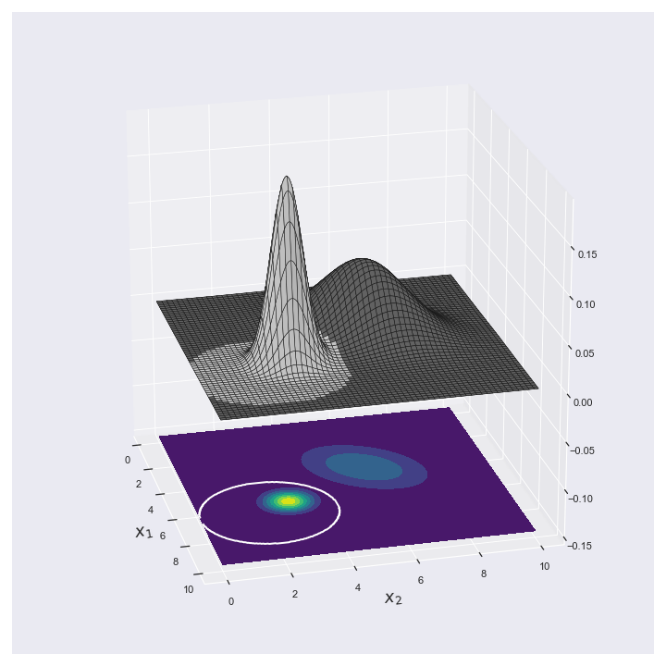
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

# **Various examples of 2-D classification using QDA**

Detailed\_example\_of\_QDA\_classification.ipynb

Various\_2D\_classification\_examples\_with\_quadratic\_discriminant\_4.png



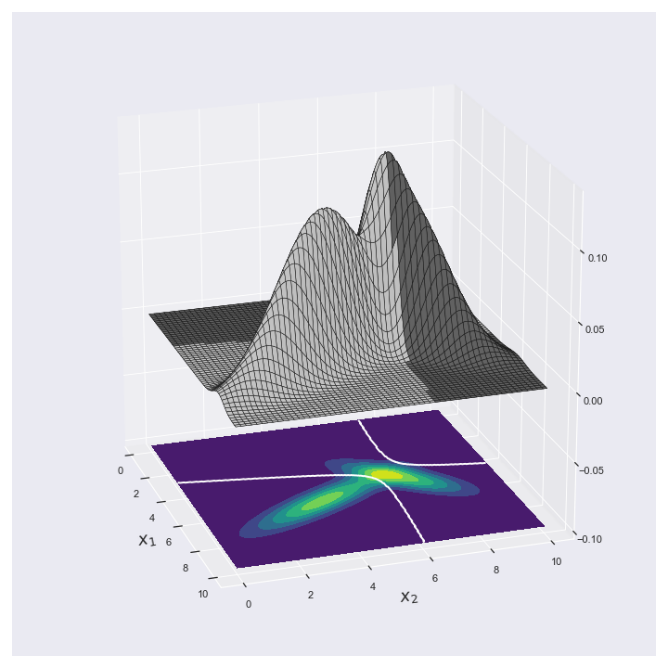
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

# **Various examples of 2-D classification using QDA**

Detailed\_example\_of\_QDA\_classification.ipynb

Various\_2D\_classification\_examples\_with\_quadratic\_discriminant\_5.png



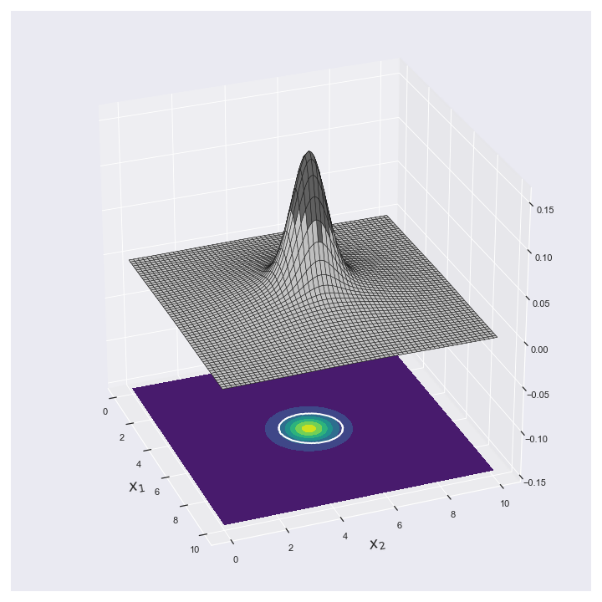
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

# **Various examples of 2-D classification using QDA**

Detailed\_example\_of\_QDA\_classification.ipynb

Various\_2D\_classification\_examples\_with\_quadratic\_discriminant\_6.png



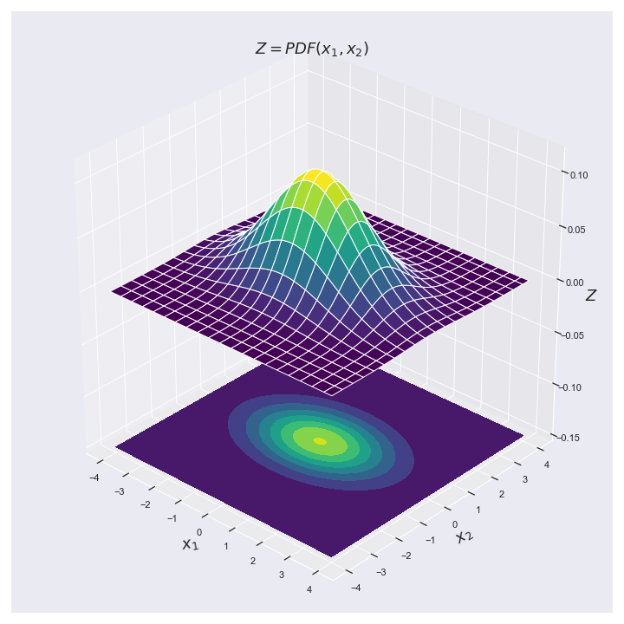
**------------------------------------------------------------------------------------------------------------------------------------------**

**Description :**

# **Various examples of 2-D classification using QDA**

generate\_surface\_visualizations\_of\_2D\_gaussian\_PDF.ipynb

Surface\_visualization\_of\_2D\_gaussian\_PDF\_without\_correlation.png



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**Description :**

# **Various examples of 2-D classification using QDA**

generate\_surface\_visualizations\_of\_2D\_gaussian\_PDF.ipynb

Surface\_visualization\_of\_2D\_gaussian\_PDF\_with\_correlation.png

