



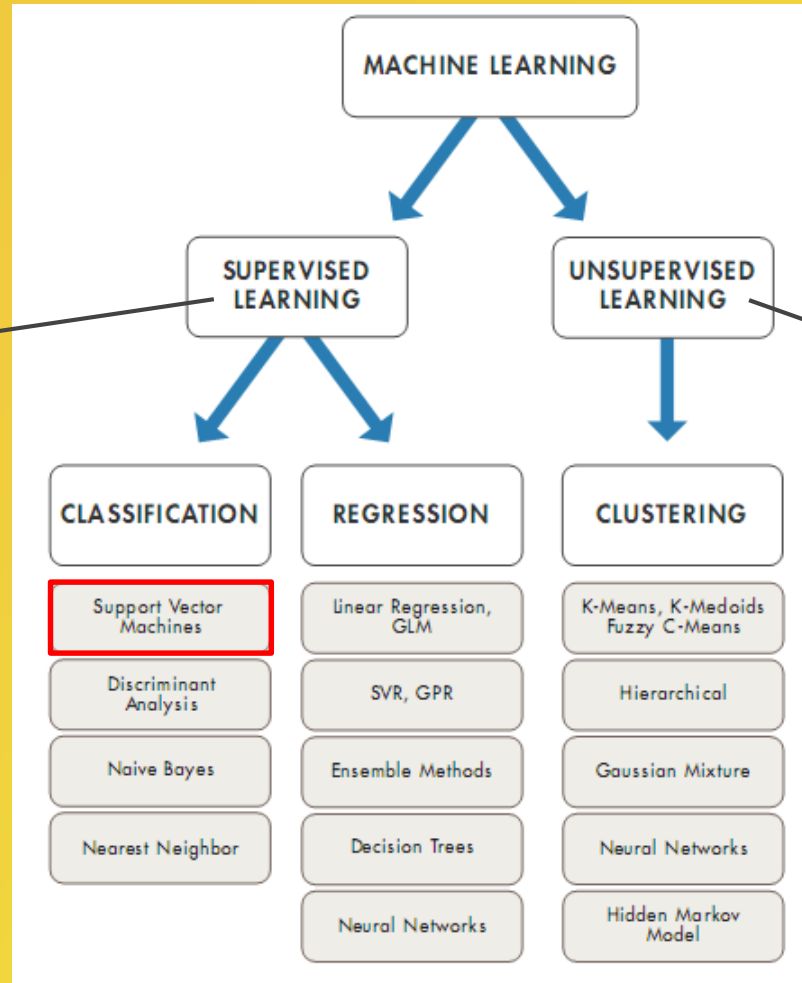
# Support Vector Machine (SVM)



Study Club IKS 2021 – Wanda Listathea Putri  
(17 Oktober 2021)



Data **dengan**  
label/target



Data **tanpa**  
label/target





## Regresi

Independent Variable (X)				Dependent Variable (Y)
body-style	engine-size	horsepower	peak-rpm	price
convertible	130	111	5000	13495
convertible	130	111	5000	16500
hatchback	152	154	5000	16500
sedan	109	102	5500	13950
sedan	136	115	5500	17450
wagon	136	110	5500	18920
hatchback	131	160	5500	?

prediksi harga mobil

## Klasifikasi

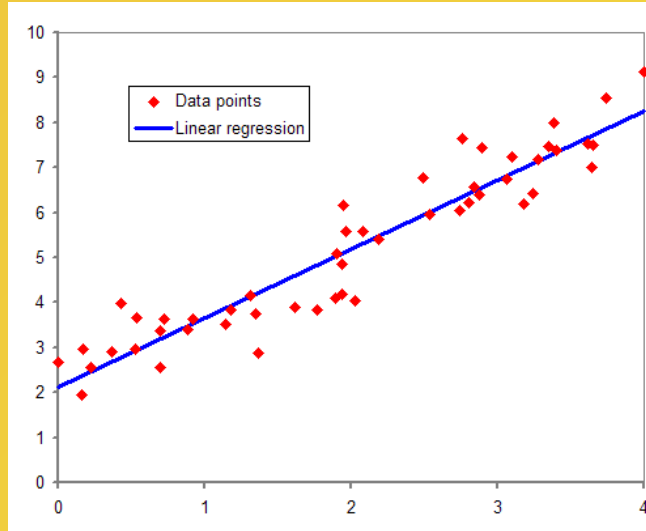
Feature Variables				Target Variable
sepal-length	sepal-width	petal-length	petal-width	class
5.1	3.5	1.4	0.2	Iris-setosa
5.4	3.9	1.7	0.4	Iris-setosa
5.9	3.2	4.8	1.8	Iris-versicolor
6.8	2.8	4.8	1.4	Iris-versicolor
6.9	3.2	5.7	2.3	Iris-virginica
7.4	2.8	6.1	1.9	Iris-virginica
6.2	2.8	4.8	1.8	?

prediksi jenis bunga iris

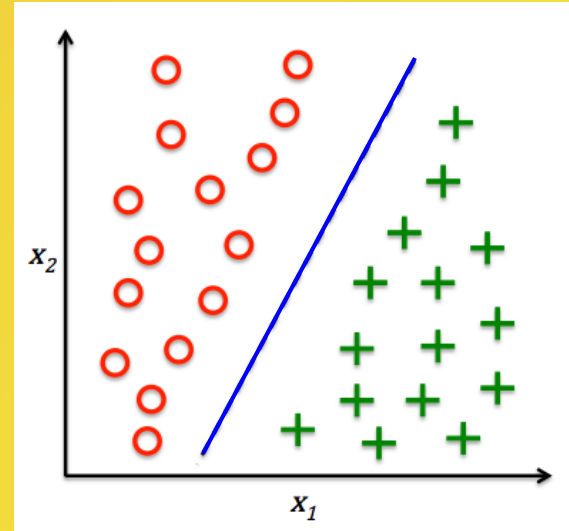


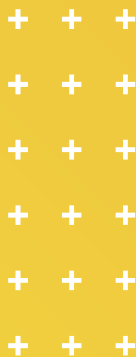


## Regresi



## Klasifikasi



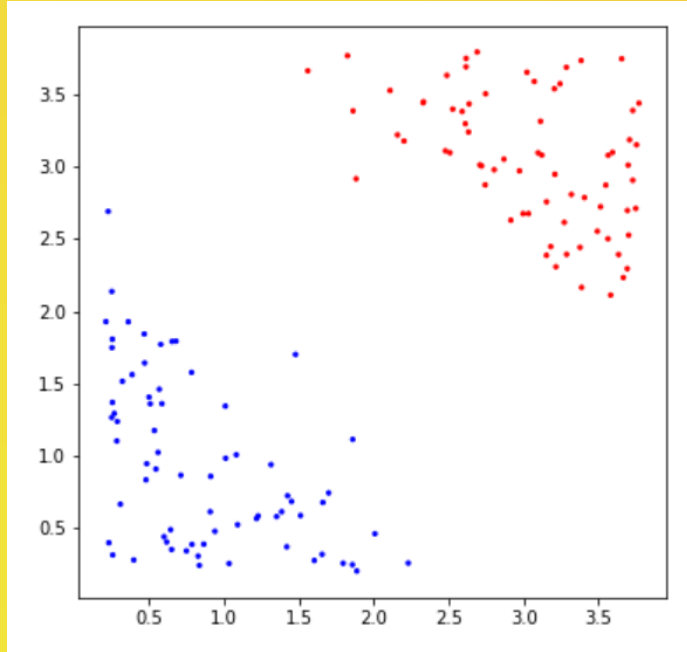


Algoritma supervised untuk  
klasifikasi yang bekerja dengan  
cara mencari **hyperplane** dengan  
**margin** terbesar

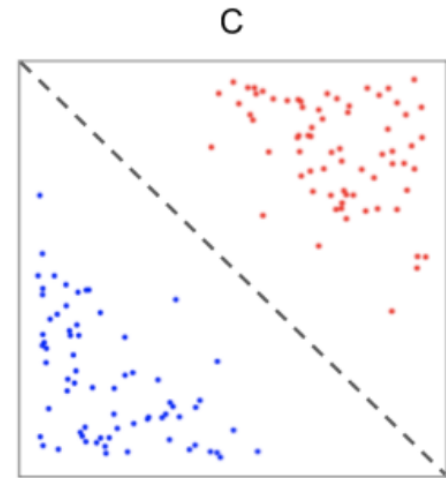
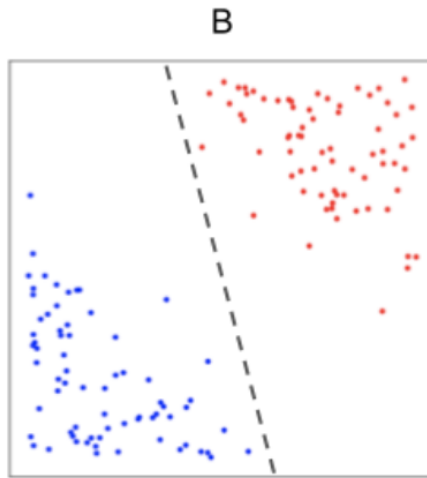
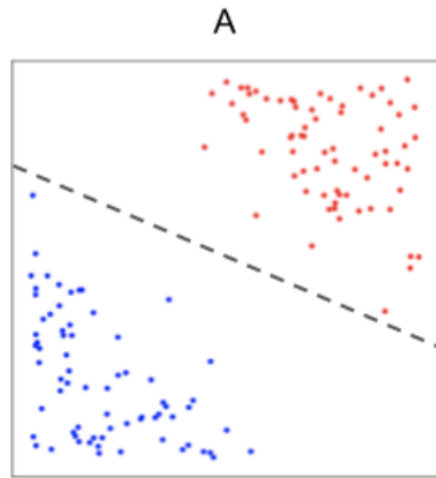
# SVM

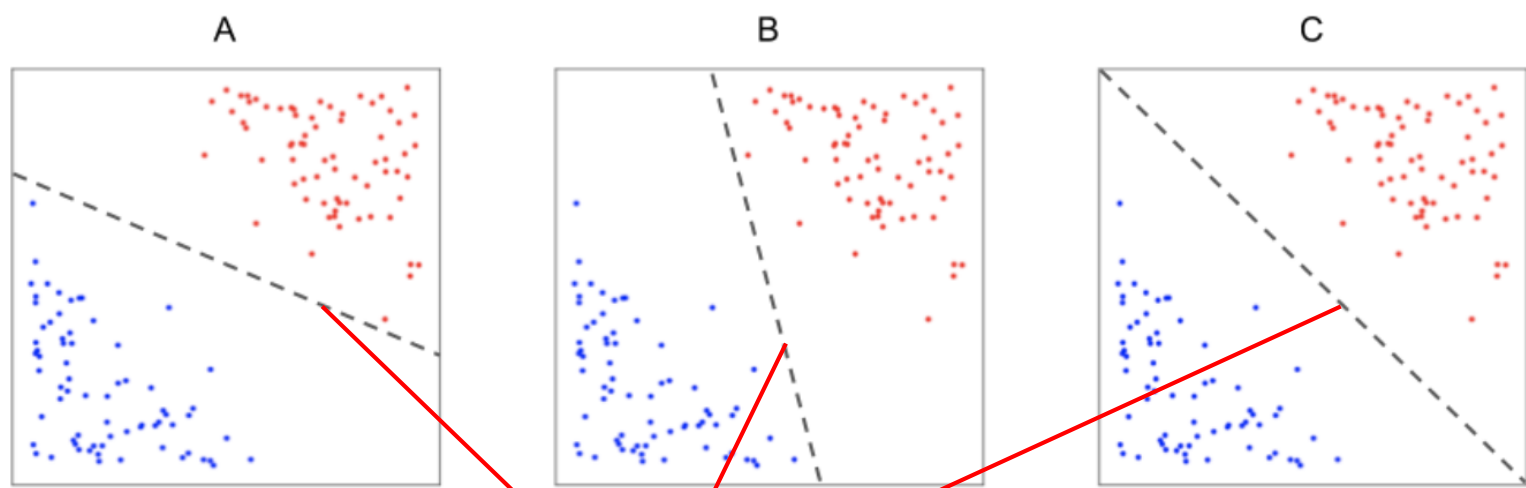


# Ilustrasi SVM



Manakah garis yang paling baik dalam memisahkan kedua kelas?





**Decision Boundary  
(Hyperplane)**

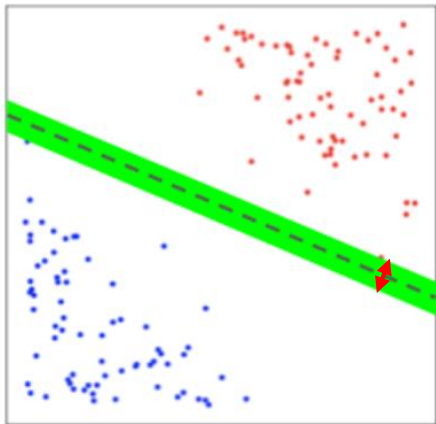
Pemisah Kelas:

- 2D -> Line
- 3D -> Plane
- Multidimensi -> Hyperplane

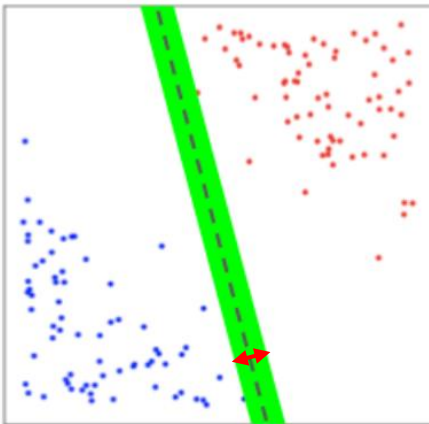


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+ + +  
+ + +

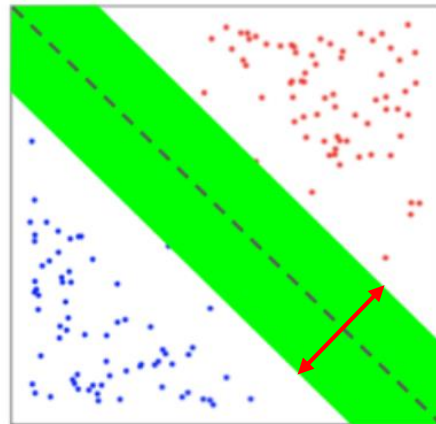
A



B

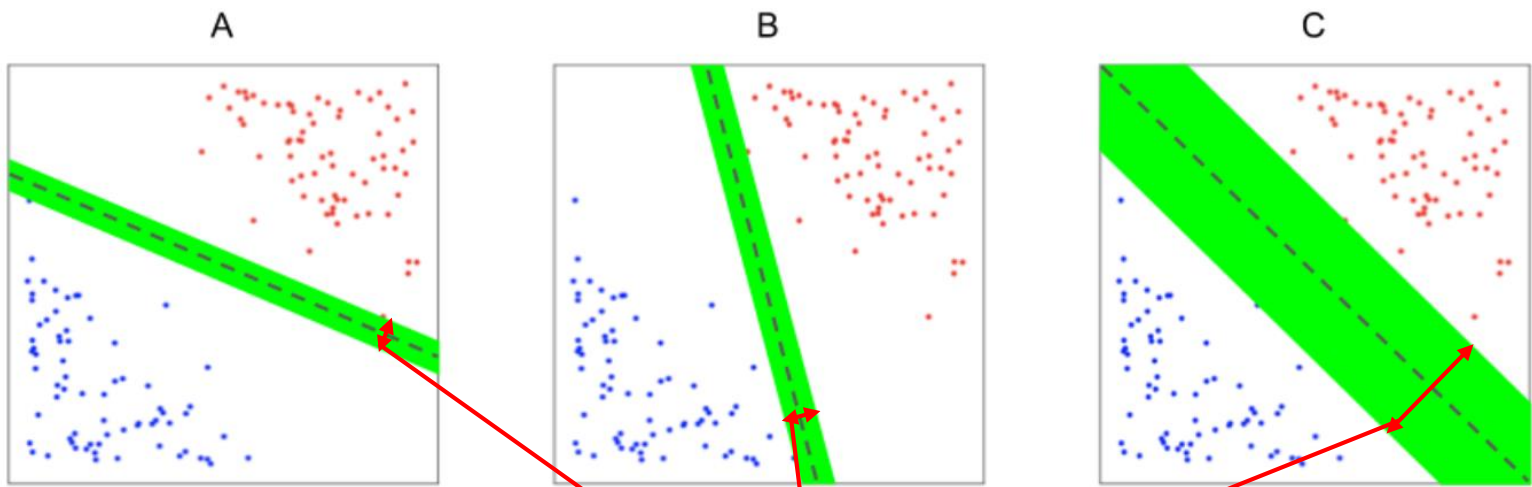


C



+

+

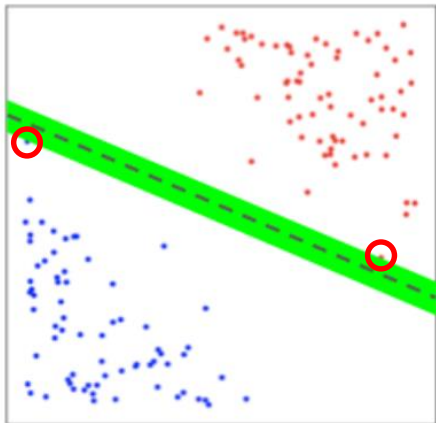


**Margin**

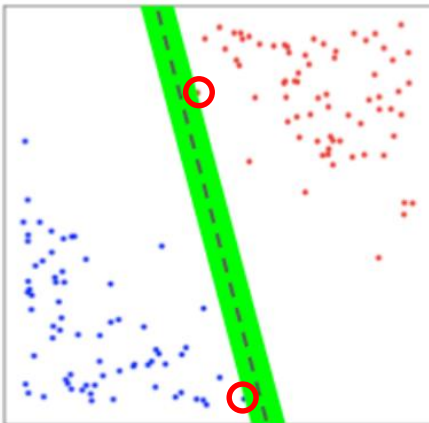
SVM akan memilih margin terbesar (maximum margin)

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+ + +  
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+ + +

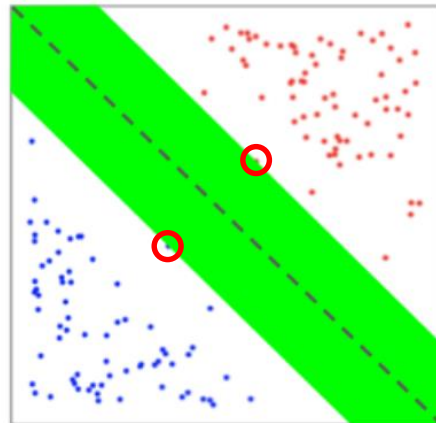
A



B

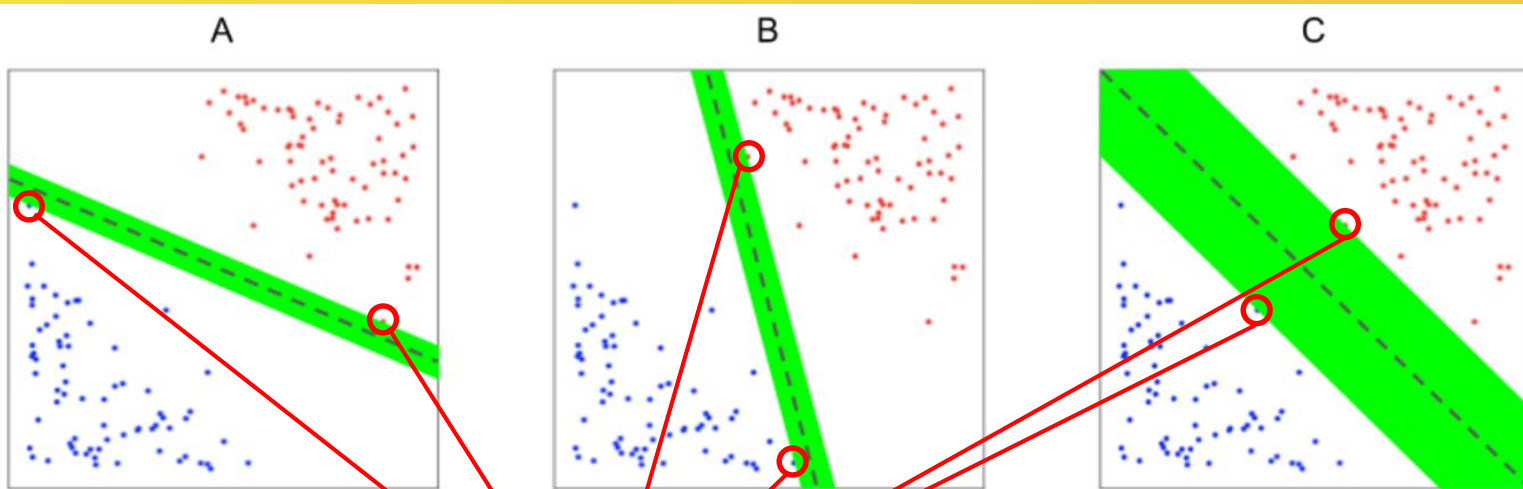


C



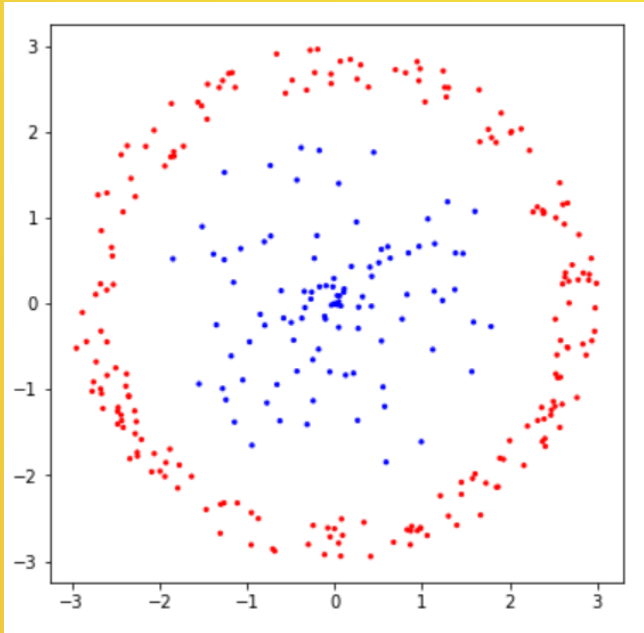
+

+



**Support Vector**

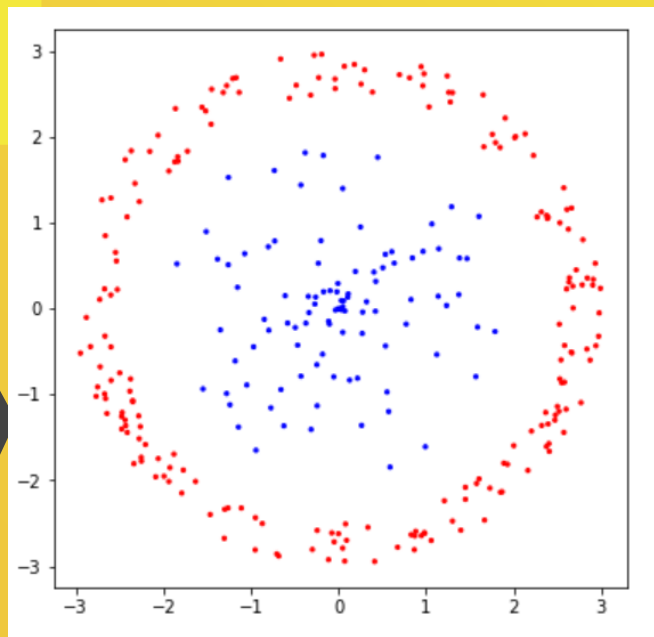
# Bagaimana jika data tidak linear?



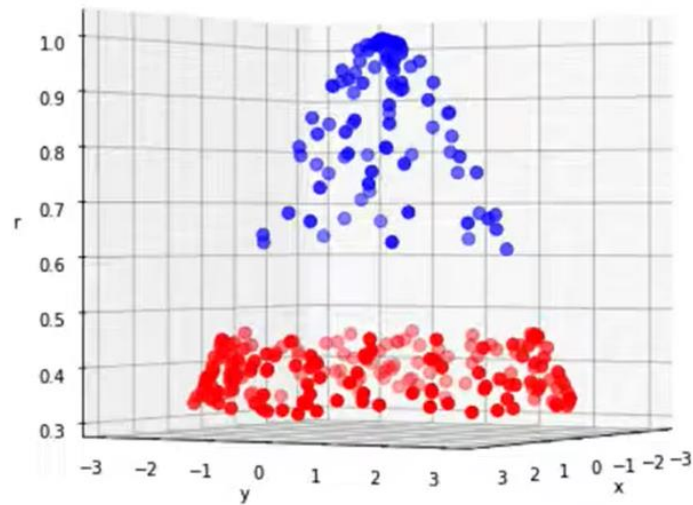
Ada cara yang bernama **Kernel Trick** dimana data akan diproyeksikan ke dimensi yang lebih tinggi (higher dimension)



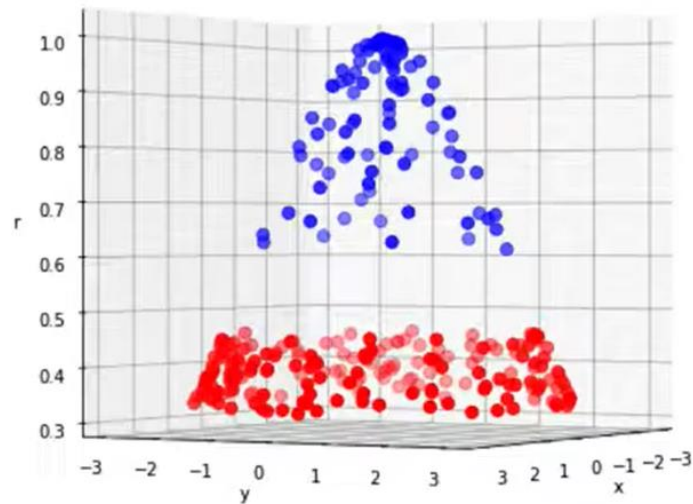
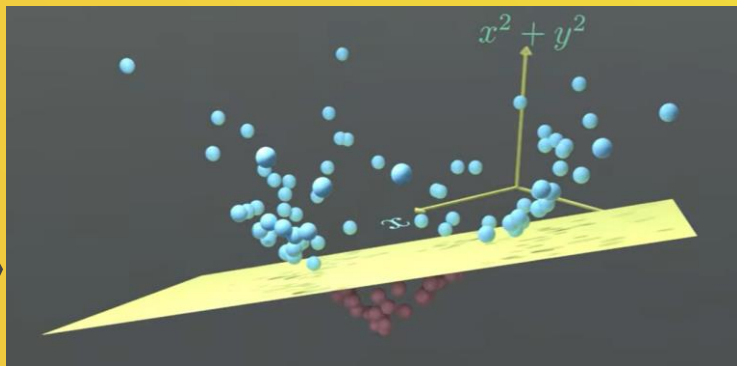
# 2D



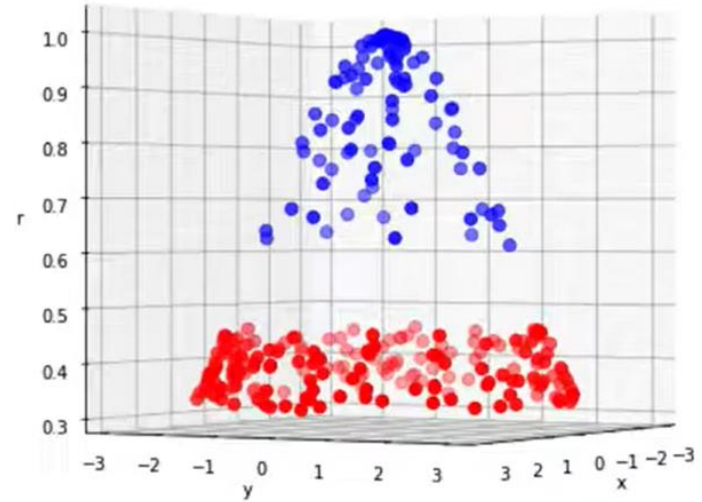
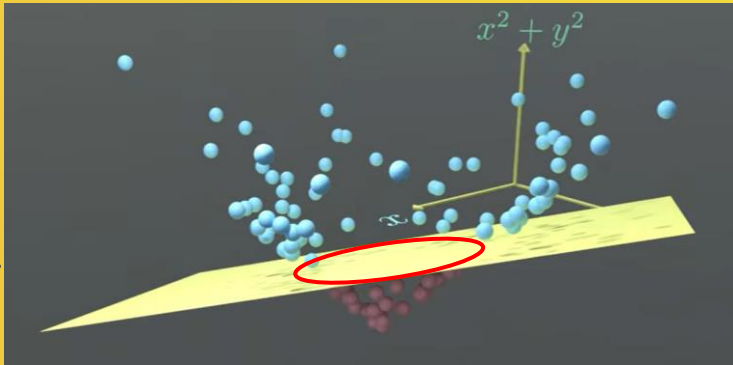
# 3D



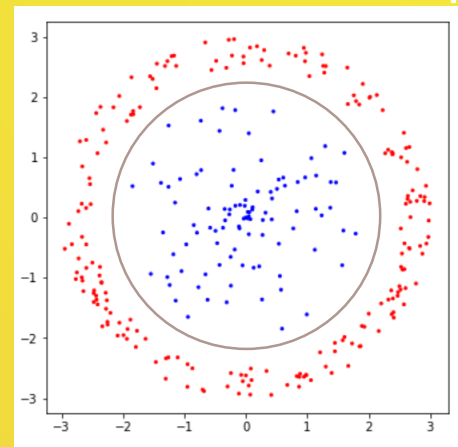
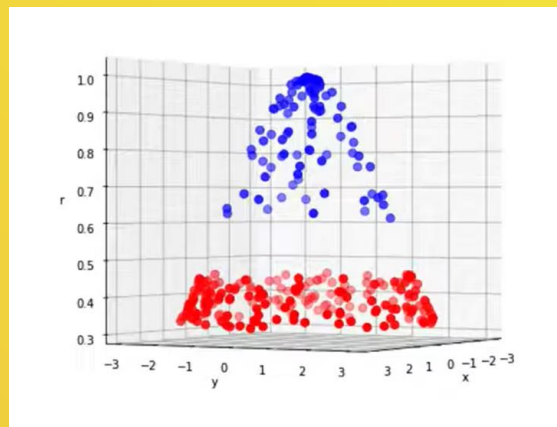
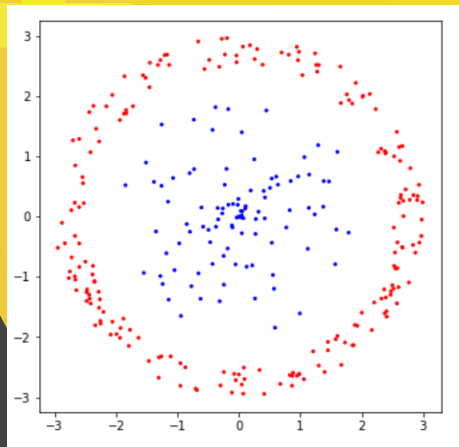
# 3D



# 3D







# Jenis Kernel



- Polinomial
- Sigmoid
- RBF (Radial Basis Function)
- dll





# Referensi

1. <https://medium.com/@samsudiney/penjelasan-sederhana-tentang-apa-itu-svm-149fec72bd02>
2. <https://ilmudatapy.com/apa-itu-regresi-klasifikasi-dan-clustering-klasterisasi/>
3. <https://towardsdatascience.com/supervised-learning-basics-of-classification-and-main-algorithms-c16b06806cd3>
4. [https://www.youtube.com/watch?v=\\_YPScrckx28](https://www.youtube.com/watch?v=_YPScrckx28)
5. <https://www.youtube.com/watch?v=MQBBE0m9pkl>
6. <https://www.youtube.com/watch?v=z69XYXpvVrE>
7. <https://www.youtube.com/watch?v=xqun1sHGuS4>





# Mari Praktik!





# Terima Kasih

