# EXPERIMENT NUMBER: 04

**Date of Performance: Date of Submission:**

**Aim:** Python Implementation of Support Vector Machine

**Software:** Python

**Software Platform:** Anaconda, Google Colab, Visual Studio

**Lab Outcome:** LO1: Implement various Machine learning models

**Theory:** Support Vector Machine (SVM) is a supervised machine learning algorithm used for both classification and regression. Though we say regression problems as well it is best suited for classification. The main objective of the SVM algorithm is to find the optimal hyper plane in an N-dimensional space that can separate the data points in different classes in the feature space. The hyperplane tries that the margin between the closest points of different classes should be as maximum as possible. The dimension of the hyperplane depends upon the number of features. If the number of input features is two, then the hyperplane is just a line. If the number of input features is three, then the hyperplane becomes a 2-D plane. It becomes difficult to imagine when the number of features exceeds three.

Let’s consider two independent variables x1, x2, and one dependent variable which is either a blue circle or a red circle.

# https://media.geeksforgeeks.org/wp-content/uploads/20201211162942/Capture.JPG

# One reasonable choice as the best hyperplane is the one that represents the largest separation or margin between the two classes. So we choose the hyperplane whose distance from it to the nearest data point on each side is maximized. If such a hyperplane exists it is known as the **maximum-margin hyperplane/hard margin**.

# Methodology: Write a python code to implement Linear Regression.

# Output: Python Program with output

Conclusion: We study Support Vector Machine in ML.

Compare with simple linear regression and justify for the given problem

statement which one is more suitable

Marks Obtained and Signature:-

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| R1  (2 Marks) | R2  (3 Marks) | R3  (4 Marks) | R4  (4 Marks) | R5  (2 Marks) | Signature |
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