



Support Vector Machine



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1. Introduction

NextGen Invent corporation is a leading global technology services provider. Our multi-disciplinary teams, Data Scientists, Change Agents, Strategists and Process Analysis framework are delivering Robotic Process Automation solution to its clients.

NGI in partnership with Automation Anywhere is delivering Stats/ML/AI/NLP/OR/Deep Learning models as ready to use Cloud Bots that are providing efficiencies across business processes, improved customer conversion rate and reduced churn rate.

1.1.Overview

A business user could use this bot to classify a large volume high dimensional data to solve a business classification problem (Principles of Support Vector Machine). This Bot takes input data in CSV file and performs the SVM algorithm driven classification and provides output in the MS excel.

1.2.Use cases

- SVM could be used to create 'Response Models' in direct marketing where intelligent identification of prospects is required.
- SVM could be used as a robust tool for customer targeting and campaign design.
- SVMs have been successfully used for classifying the polarity and preferences.
- This bot could predict the multiclass classification problems of the target variable.



2. Requirements & Prerequisites

2.1. System Requirements

For the PC or server where the bot needs to run:

Device	Processor	RAM	Storage	Network
Machine	Intel Core i5 or higher	8GB or higher	16GB	1GbE
Bot Creator and Bot Runner	No additions to the machine requirements	No additions to the machine requirements	No additions to the machine requirements	No additions to the machine requirements

2.2. Prerequisites

Software's required -

Automation Anywhere Plugin version	Excel Requirement Version
11.x	2013 version or higher

Data requirement -

Data should be pre-processed before feeding it to the bot and it should contain at least 5,000 rows for training with around 8-9 minimum features every time to obtain desired accuracy.



3. Getting Started

3.1.Skill Matrix

- Support vector machines (SVMs) are powerful yet flexible supervised machine learning algorithms which are used both for classification.
- SVM extremely effective is its ability to model complex, real-world classification problems even non-linear classification.
- The Bot ingests labeled input data in CSV file and performs the SVM algorithm driven classification and provides output in the MS excel of binary and multi-class output.

3.2.Installation Hierarchy

- Download the bot from Bot Store.
- Double click on the .msi file.
- On Welcome to Installation wizard, click Next to continue.
- Click I agree to the terms in the license agreement radio button to accept the agreement.
- Get/Copy the License key from Bot Store Downloads into License Key, click Next to continue.
- Click Install to begin the installation.
- Click Finish to complete the installation.
- To view the installation, go to 'My Tasks' folder on AAE Client to see bot files.

3.3.Configuration

Inputs:

Parameter	Type	Direction	Additional Info
Path	String	Input	Path of the CSV file For example: C:\~\ Marketing-Customer-Value-Analysis.csv
ColumnCount	Numeric	Input	Count of columns available in CSV file being provided with input data
InputColumnNames	String	Input	Name of columns being provided in CSV file. For example: 'Customer ID','Coverage','Gender','Income','Marital Status','Monthly Premium Auto','Months Since Last Claim','Policy Type','Sales Channel','Total Claim Amount','Vehicle Class','Vehicle Size','Response'
InputColumnDataType	String	Input	Data Type of columns being provided in CSV file in the same order as column names. For example:



MissingNumberValueReplacement	String	Input	'String','String','String','Numeric','String','Numeric','Numeric','String','String','Numeric','String','String','String'
IgnoreColumns	String	Input	Names of the column that model should ignore while calculating correlation. For example: ' Marital Status
PredictionColumnName	String	Input	Header of the Column on which you want to predict Ex: 'Response'

Input Sample:

The below examples shows that the responses of the customer value analysis for the car and getting the response in yes or no i.e. if the customer is satisfied or not

Coverage	Gender	Income	Marital Status	Monthly Premium Auto	Months Since Last Claim	Policy Type	Sales Channel	Total Claim Amount	Vehicle Class	Vehicle Size	Response
Extended	F	18,213	Divorced	96	12	Corporate Auto	Branch	460.80	Four-Door Car	Large	Yes
Extended	F	0	Single	91	3	Personal Auto	Agent	655.20	Four-Door Car	Medsize	No
Basic	F	0	Divorced	116	25	Corporate Auto	Branch	556.80	SUV	Medsize	No
Basic	M	0	Married	102	13	Personal Auto	Call Center	610.62	SUV	Large	No
Premium	F	30,361	Married	119	28	Personal Auto	Branch	373.29	Four-Door Car	Medsize	Yes
Premium	M	0	Married	105	3	Personal Auto	Branch	504.00	Four-Door Car	Large	No
Basic	F	0	Single	68	2	Personal Auto	Branch	326.40	Two-Door Car	Small	No
Premium	M	96,060	Married	117	6	Corporate Auto	Branch	561.60	Four-Door Car	Large	No
Basic	F	25,398	Married	74	23	Personal Auto	Branch	465.92	Four-Door Car	Large	Yes
Basic	F	29,031	Married	61	7	Personal Auto	Agent	292.80	Four-Door Car	Medsize	No
Basic	M	92,949	Married	74	21	Personal Auto	Web	337.31	Two-Door Car	Medsize	No
Basic	F	0	Single	68	3	Corporate Auto	Agent	356.08	Four-Door Car	Medsize	No
Basic	M	46,900	Married	66	13	Corporate Auto	Web	316.60	Four-Door Car	Medsize	
Premium	M	97,024	Married	177	0	Personal Auto	Branch	686.62	SUV	Medsize	
Extended	F	0	Single	94	15	Corporate Auto	Branch	648.74	Two-Door Car	Small	
Basic	F	61,896	Married	104	25	Personal Auto	Call Center	461.31	SUV	Medsize	
Basic	F	39,317	Single	64	22	Personal Auto	Branch	77.70	Four-Door Car	Medsize	
Extended	M	43,987	Married	96	29	Personal Auto	Call Center	460.80	Four-Door Car	Medsize	
Basic	M	37,722	Single	116	8	Personal Auto	Agent	158.08	Sports Car	Medsize	
Basic	M	78,618	Divorced	66	7	Corporate Auto	Agent	225.58	Two-Door Car	Medsize	
Basic	F	30,205	Single	155	24	Personal Auto	Agent	1,329.96	Luxury SUV	Large	
Basic	M	57,023	Single	67	11	Personal Auto	Agent	250.65	Four-Door Car	Medsize	
Extended	M	36,918	Divorced	76	28	Personal Auto	Branch	364.80	Two-Door Car	Medsize	
Basic	M	0	Single	102	5	Corporate Auto	Agent	956.69	SUV	Medsize	
Premium	M	0	Married	153	25	Corporate Auto	Web	1,027.00	SUV	Medsize	
Basic	F	0	Single	109	2	Personal Auto	Agent	666.04	SUV	Medsize	
Basic	M	0	Single	108	23	Corporate Auto	Branch	1,254.16	SUV	Medsize	

Outputs:

- Output: the result in the form of the Excel
- Binary class prediction output

Ex: The below the example shows the Predicted class which states that the response yes or no

Output Sample:



Coverage	Gender	Income	Marital Status	Monthly Premium Auto	Months Since Last Claim	Policy Type	Sales Channel	Total Claim Amount	Vehicle Class	Vehicle Size	Gold_Class	Predicted_Class
Extended	F	18,213	Divorced	96	12	Corporate Auto	Branch	460.80	Four-Door Car	Large	Yes	Yes
Extended	F	0	Single	91	3	Personal Auto	Agent	655.20	Four-Door Car	Medsize	No	No
Basic	F	0	Divorced	116	25	Corporate Auto	Branch	556.80	SUV	Medsize	No	No
Basic	M	0	Married	102	13	Personal Auto	Call Center	610.62	SUV	Large	No	No
Premium	F	30,361	Married	119	28	Personal Auto	Branch	373.29	Four-Door Car	Medsize	Yes	Yes
Premium	M	0	Married	105	3	Personal Auto	Branch	504.00	Four-Door Car	Large	No	No
Basic	F	0	Single	68	2	Personal Auto	Branch	326.40	Two-Door Car	Small	No	No
Premium	M	96,060	Married	117	6	Corporate Auto	Branch	561.60	Four-Door Car	Large	No	No
Basic	F	25,396	Married	74	23	Personal Auto	Branch	465.92	Four-Door Car	Large	Yes	Yes
Basic	F	29,031	Married	61	7	Personal Auto	Agent	292.80	Four-Door Car	Medsize	No	Yes
Basic	M	92,949	Married	74	21	Personal Auto	Web	337.31	Two-Door Car	Medsize	No	No
Basic	F	0	Single	68	3	Corporate Auto	Agent	356.08	Four-Door Car	Medsize	No	No
Basic	M	46,900	Married	66	13	Corporate Auto	Web	316.80	Four-Door Car	Medsize		No
Premium	M	97,024	Married	177	0	Personal Auto	Branch	686.82	SUV	Medsize		No
Extended	F	0	Single	94	15	Corporate Auto	Branch	848.74	Two-Door Car	Small		No
Basic	F	61,896	Married	104	25	Personal Auto	Call Center	461.31	SUV	Medsize		Yes
Basic	F	39,317	Single	64	22	Personal Auto	Branch	77.70	Four-Door Car	Medsize		No
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Basic	F	30,205	Single	195	24	Personal Auto	Agent	1,329.96	Luxury SUV	Large		Yes
Basic	M	57,023	Single	67	11	Personal Auto	Agent	250.65	Four-Door Car	Medsize		No
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Basic	F	0	Single	109	2	Personal Auto	Agent	666.04	SUV	Medsize		No
Basic	M	0	Single	108	23	Corporate Auto	Branch	1,254.18	SUV	Medsize		No

4. Logs

Error Handling In case of Errors, Error Logs & Screenshots are generated within Error Folder.

Each Bot folder contains the below hierarchy.

1 Error Folder

1.1 Logs

1.1.1 ErrorLogsMonth-Day-Year.txt: In case of any error, this file logs error message along with timestamp

1.2 Snapshots

1.2.1 Error SnapMonth-Day-Year-Hour-Minute-SecondMillisecond.png: In case of any error, this file captures screenshot of error.

Task Status of bot is set to failed in case of error.



5. Troubleshooting & Support

5.1 Support

Please Email bot.support@nextgeninvent.com for any support related questions.



Appendix A - Record of Changes

Version #	Date of Change	Author	Notes
V1.0	June 26 th 2020	Nextgen Invent Corporation	

Appendix B - Acronyms

#	Acronym	Description
1.	AA	Automation Anywhere
2.	API	Application Programming Interface
3.	RAM	Random Access Memory
4.	OS	Operating System

Appendix C - References

#	Topic	Reference Link
1.	Nextgen Invent Corporation	https://www.nextgeninvent.com/

