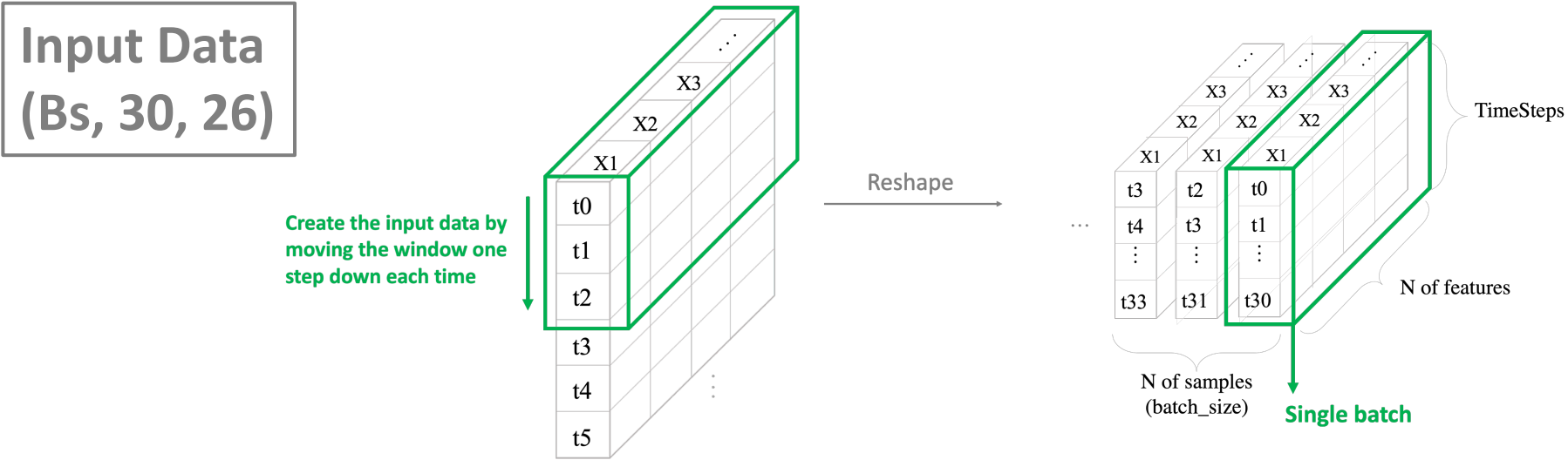


Original Data

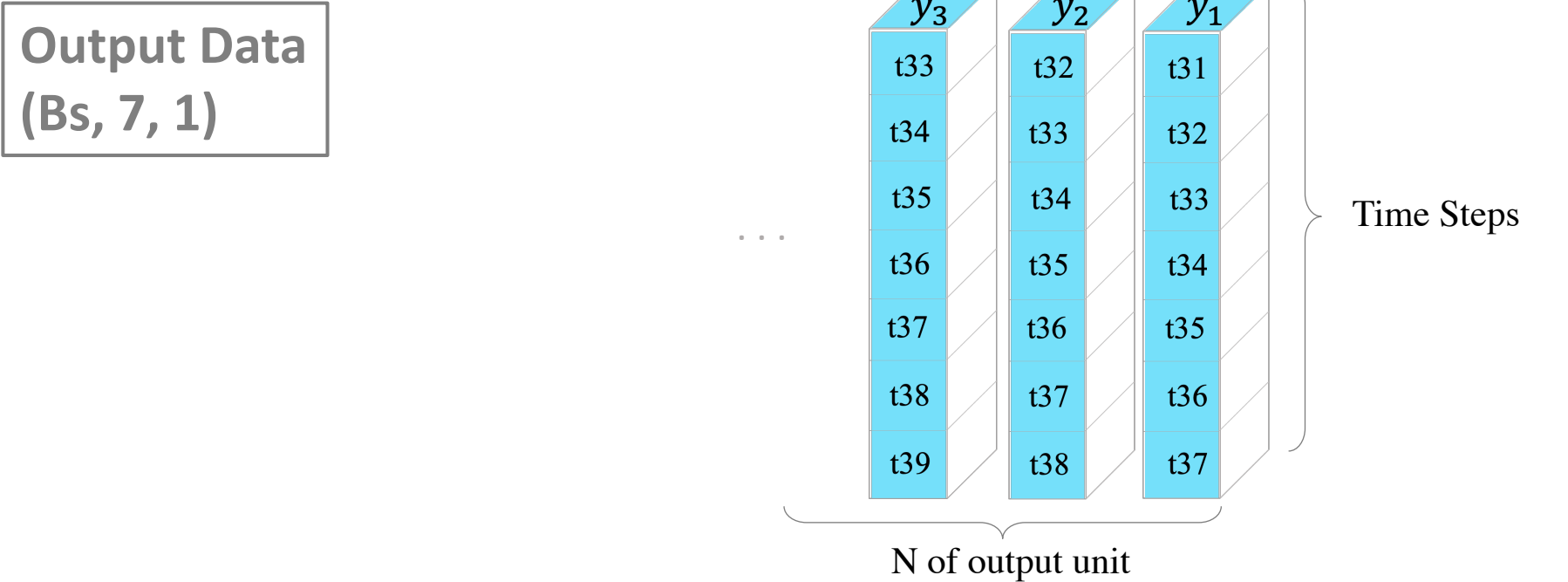
- Dataset: 2518 rows * 27 columns

	Date	Open	High	Low	Close	Volume	NASDAQ	NYSE	S&P 500	FTSE100	NIKKI225	BSE SENSEX	RUSSELL2000	HENG SENG
1														
2	2010/7/1	9.082143	9.1	8.686429	8.874286	1022896000	2101.360107	6462.029785	1027.369995	4805.75	9191.599609	17509.33008	604.76001	#N/A
3	2010/7/2	8.946072	8.961785	8.685715	8.819285	693842800	2091.790039	6434.810059	1022.580017	4838.09	9203.709961	17460.94922	598.969971	19905.32031
4	2010/7/6	8.964286	9.028571	8.791429	8.879642	615235600	2093.879883	6486.089844	1028.060059	4965	9338.040039	17614.48047	590.030029	20084.11914
5	2010/7/7	8.946072	9.241786	8.919642	9.238214	654556000	2159.469971	6685.779785	1060.27002	5014.82	9279.650391	17471.0293	611.659973	19857.07031
6	2010/7/8	9.374286	9.389286	9.103214	9.2175	738144400	2175.399902	6755.810059	1070.25	5105.45	9535.740234	17651.73047	620.27002	20050.56055
7	2010/7/9	9.174643	9.282143	9.112857	9.272142	433322400	2196.449951	6808.709961	1077.959961	5132.94	9585.320313	17833.53906	629.429993	20378.66016
8	2010/7/12	9.233214	9.351786	9.102143	9.188929	562878400	2198.360107	6794.47998	1078.75	5167.02	9548.110352	17937.19922	621.609985	20467.42969
9	2010/7/13	9.154285	9.157143	8.801071	8.992857	1190924000	2242.030029	6907.779785	1095.339966	5271.02	9537.230469	17985.90039	642.820007	20431.06055
10	2010/7/14	8.906428	9.135715	8.892858	9.026072	812047600	2249.840088	6903.359863	1095.170044	5253.52	9795.240234	17938.16016	640.159973	20560.81055
11	2010/7/15	8.865357	9.1775	8.832143	8.980357	824866000	2249.080078	6916.810059	1096.47998	5211.29	9685.530273	17909.46094	634.619995	20255.61914
12	2010/7/16	9.042143	9.106071	8.871786	8.925	1039858400	2179.050049	6709.509766	1064.880005	5158.85	9408.360352	17955.82031	610.390015	20250.16016

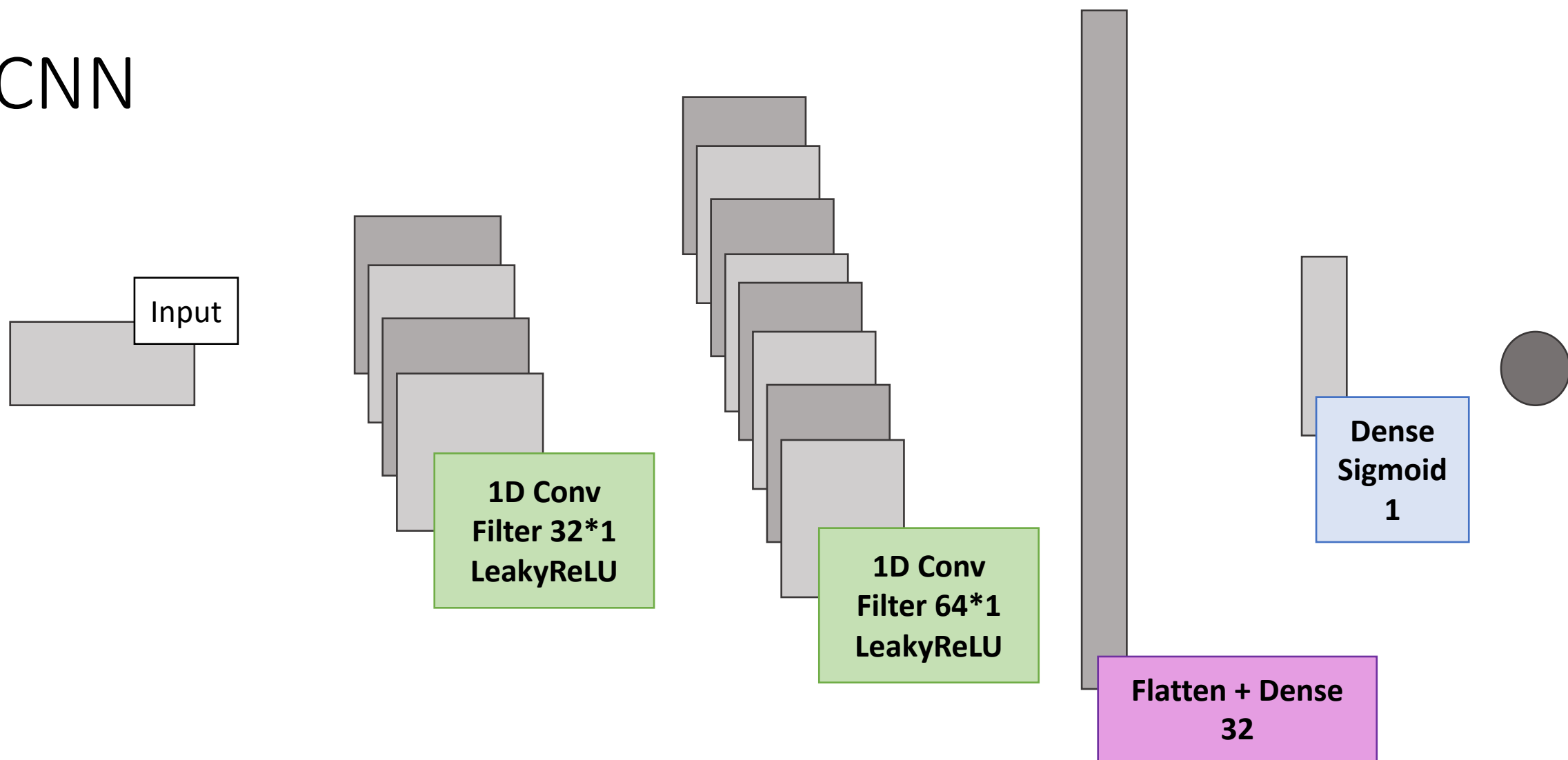
LSTM



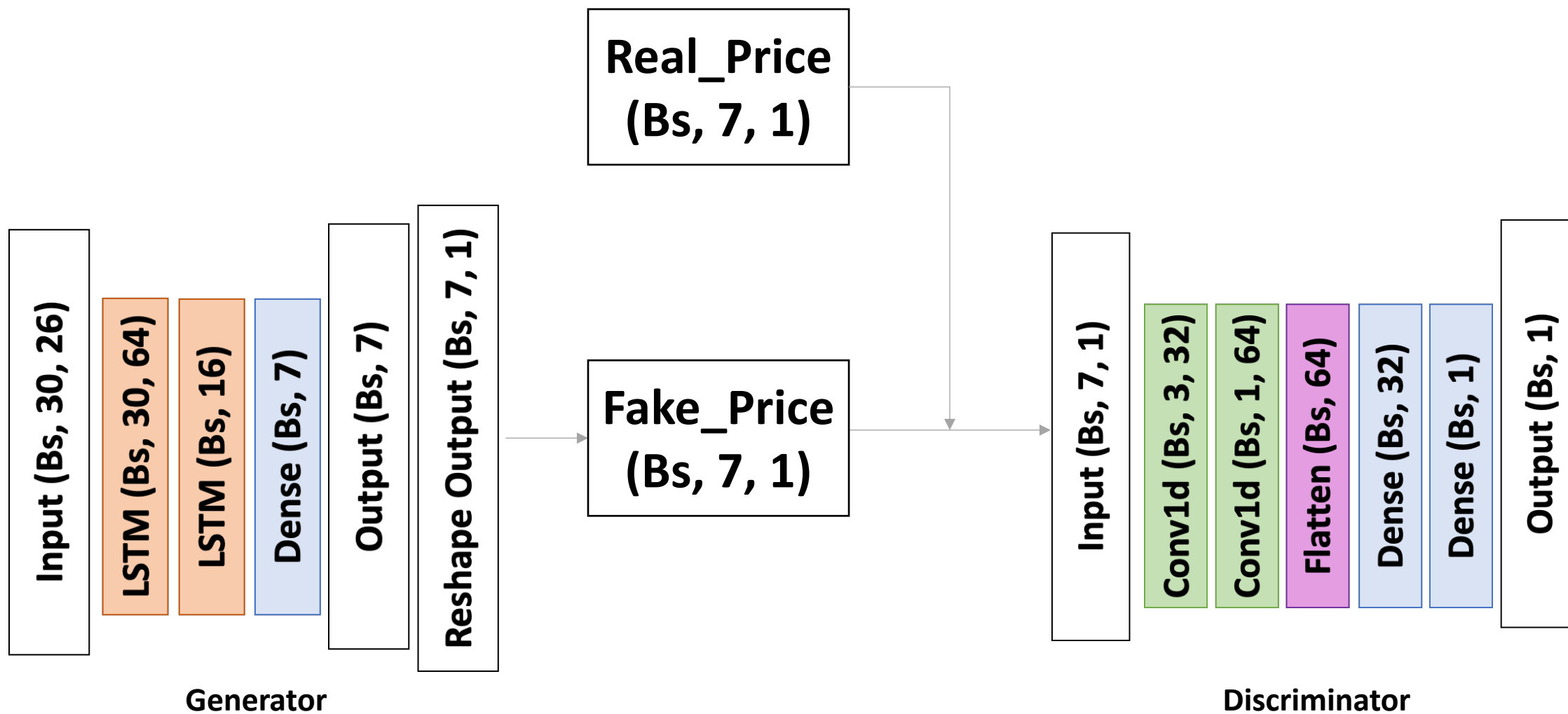
LSTM



CNN



GAN



GAN Math

- *Learning D*

Maximize the objective function:

$$\hat{V} = \frac{1}{m} \sum_{i=1}^m \log D(y^i) + \sum_{i=1}^m (1 - \log D(G(x^i)))$$

- *Learning G*

Minimize the objective function:

$$\hat{V} = \frac{1}{m} \sum_{i=1}^m (1 - \log D(G(x^i)))$$