

OEC 2018 Programming

University of Toronto A





Problem Description

Try to make the most money using a stock trading bot

Given: current and past prices of a set of stocks every minute

Unknown: future values of stocks



Problem Analysis

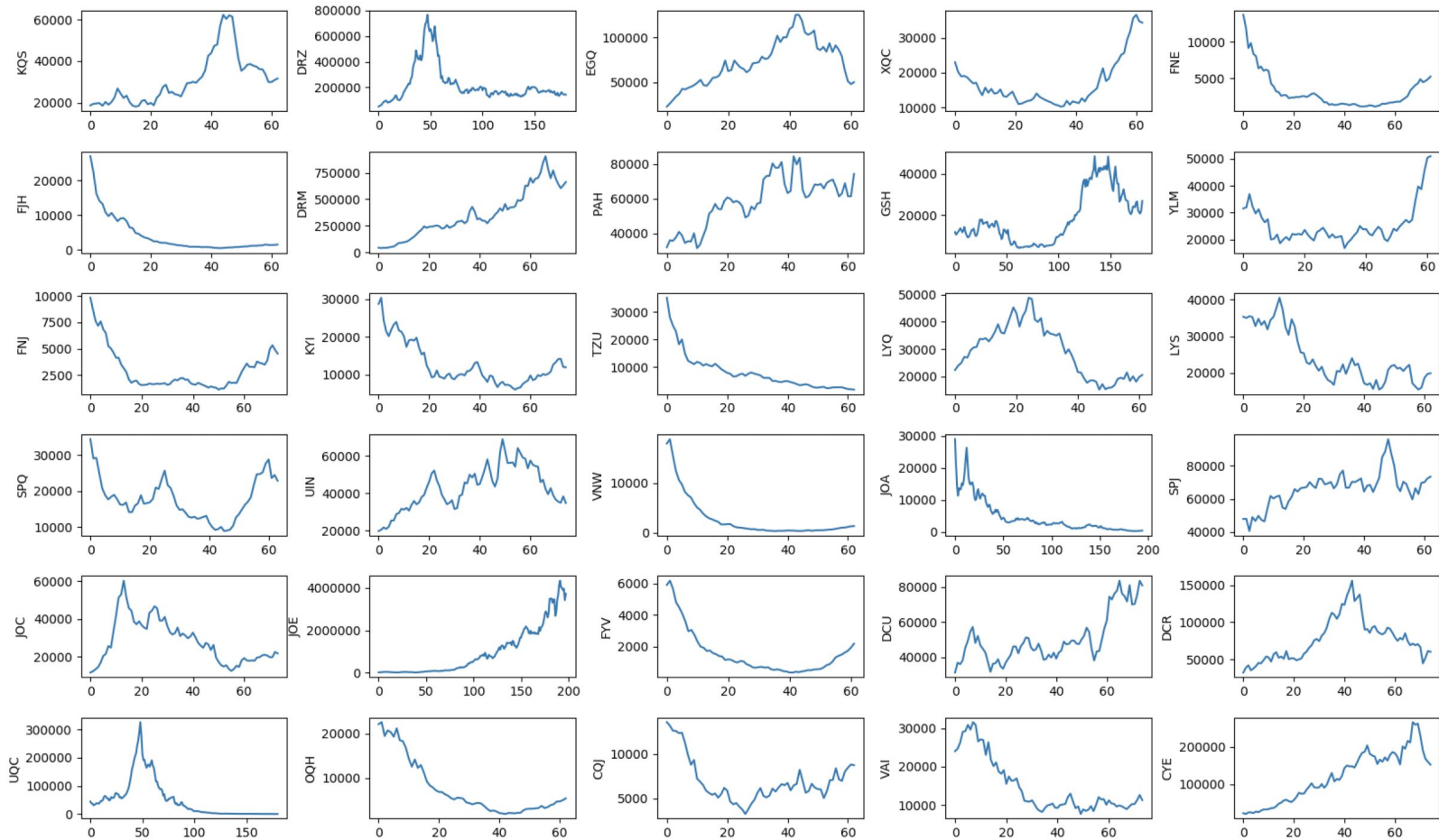
Information given is purely numerical

Market cap, company metrics (earnings, debt) are not given

Observed that the majority of stocks had either “smooth” or “unsmooth” price histories

Smooth stocks did not transition into unsmooth and vice versa

Idea- if volatile stocks appear to stay volatile, can take advantage of this via short-term transactions





Solution

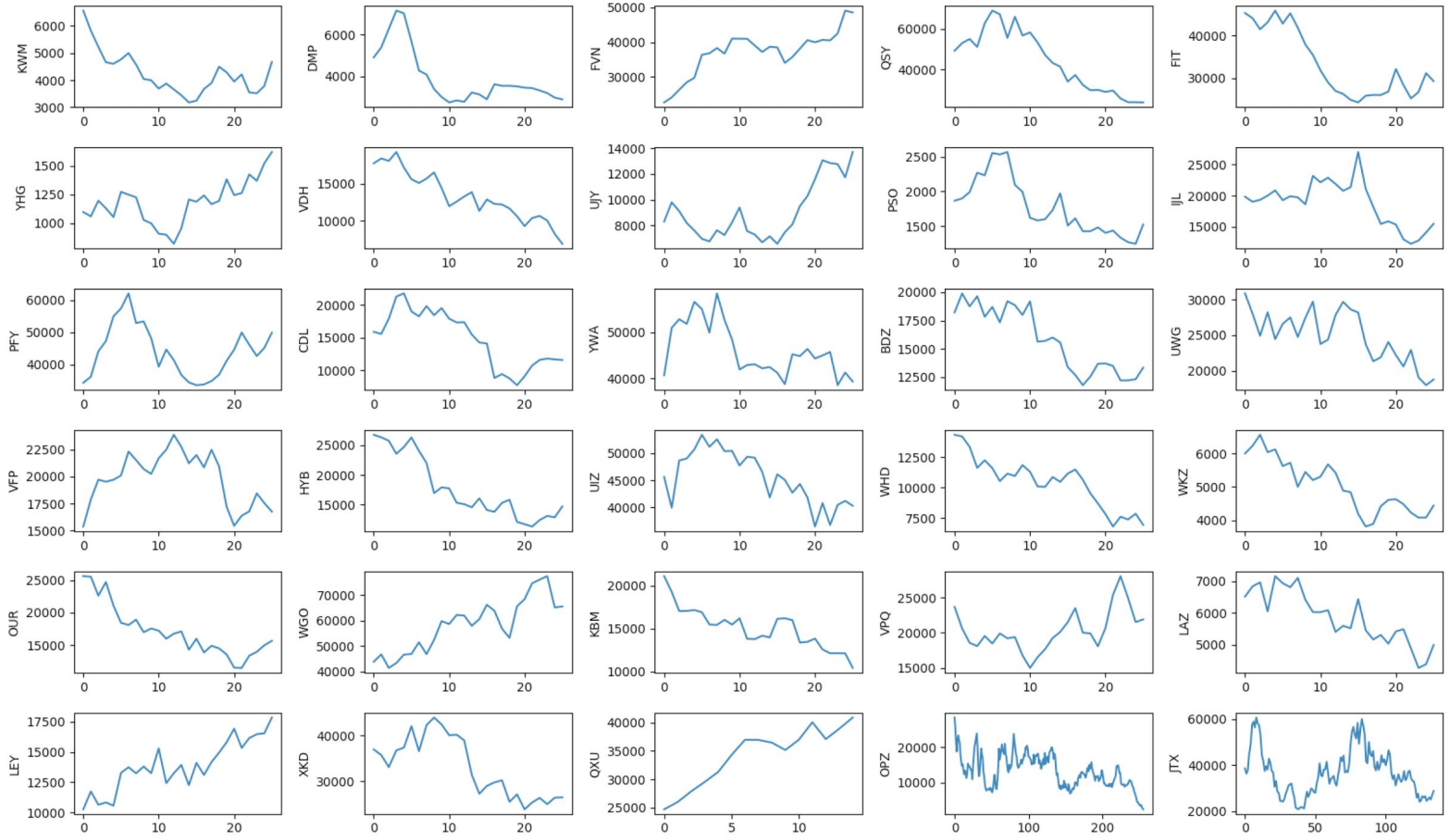
Solution takes advantage of volatile nature of certain stocks

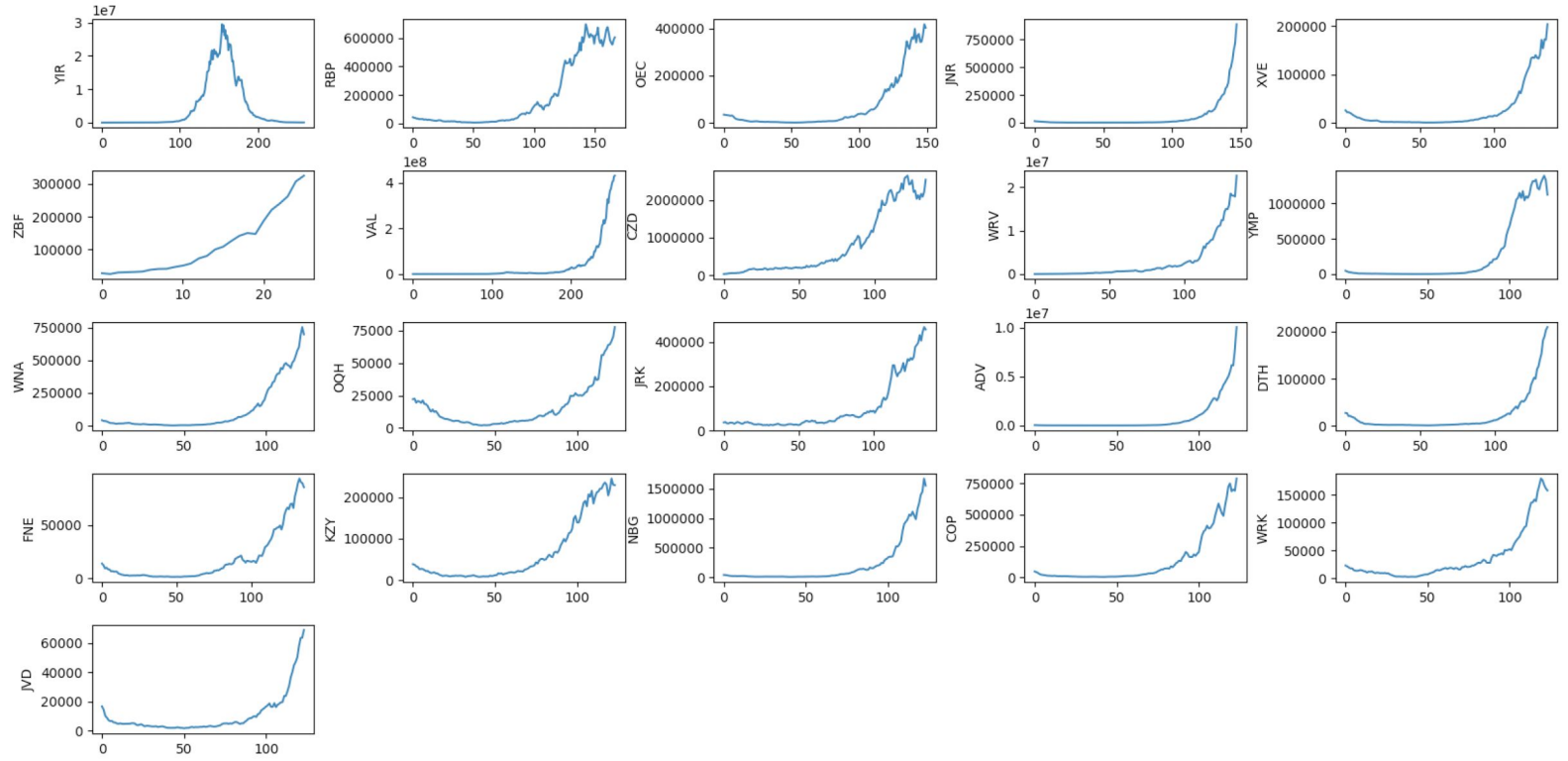
Buy when the stock starts to rise

Sell when the stock starts to fall

Avoid “smooth” stocks- no potential for short-term gains

Smoothness determined by autocorrelation coefficient







Prediction Algorithm

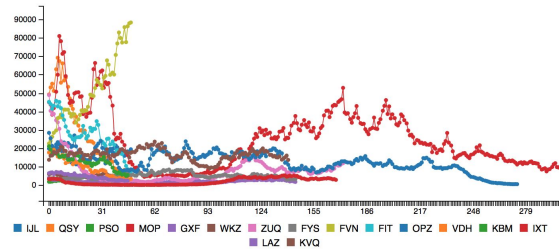
- Buy low sell high
- Smoothed first and second derivatives
- Also considered autocorrelation

User Dashboard

Real-time status of our account status as well as the historical prices of any stock

OEC 2018 - UofT A - Stock Bot Dashboard

Stock Prices



Click to show:

ADV	AES	AIU	ARW	BDZ	BHP	BIR	BVJ	BVY	CDL	CMQ	COP	CQJ
CQW	CRA	CRH	CTR	CVA	CYE	CZD	DAV	DBC	DCR	DCU	DMP	DRM
DRZ	DTH	DYJ	EFQ	EVI	FIG	FIT	FJH	FNE	FNJ	FVN	FYS	FYV
FZO	GBO	GSH	GVI	GXF	HDA	HNO	HQB	HQK	HUX	HXG	HYB	HYS
IBM	IJL	IKG	ILV	IXT	IYG	IZA	JAR	JNR	JOC	JOE	JRK	JTX
JVD	JXV	JYW	KBM	KBP	KEG	KIR	KIV	KIY	KJX	KQS	KRA	KVQ
KWM	KXU	KYI	KZY	LAZ	LCH	LDO	LEY	LFW	LKY	LOT	LWV	LYQ
LYS	MFA	MLC	MOE	MOP	MPB	MTG	NBQ	NBH	NDP	NGV	NJD	NTK
NVF	OEC	OGN	OGW	OLE	OLS	OPZ	OQH	OUR	QVM	PAH	PFY	PHA
PDQ	PSO	PUF	PVH	QFI	QIS	QVY	QWY	QXU	QYI	QYU	QYV	QYU

Account Status

Cash on hand:

20327

Holdings:

QSY: 18900, Δ : -20.96%

IJL: 136395, Δ : 2.90%

PSO: 172602, Δ : -41.21%

GXF: 783640, Δ : -11.22%

MOP: 231525, Δ : -60.94%

WKZ: 35833, Δ : 13.76%

ZUQ: 131318, Δ : -22.89%

FYS: 165903, Δ : 9.27%

FVN: 441300, Δ : 47.05%

FIT: 113160, Δ : -65.65%

OPZ: 170240, Δ : -48.34%

VDH: 27696, Δ : -16.60%

KBM: 5508, Δ : -21.91%

IXT: 115800, Δ : -32.63%

LAZ: 1399540, Δ : -38.18%

KVQ: 2898296, Δ : -24.29%

Total performance:

-31.32%



Testing (Simulation)

Testing was done on historical pricing data

Historical pricing resulted in a 2400x increase in net value to \$240 mil

Simulation testing performed on a 173-step period

