

比特幣以時間序列作為預測實驗記錄

- 資料集：全部歷史資料、去除前兩年歷史資料、去除前四年歷史資料
- 測試集：30%、20%、10%、7 筆
- 基礎模型：線性回歸(LR)、支持向量機(SVM)、隨機森林(RF)、Holt-Winters(HW)、ARIMA、Prophet
- 指標：MAE、RMSE
- 合計：3*4*6=72 個組合
- 實際收益：假設一直持有該金融產品，測試集中持有最後一天價格減去持有第一天價格，以符合正情況。
- 預期收益：使用該預測模型進行買賣金融產品，如預測明天會漲，則今天就買進，反之。其中包括獲利與止損。

- 比特幣全部歷史資料(測試集=30%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	137.7124	289.4985	956.6456	1394.8989	11.1660	-25.1117
SVM	135.1549	295.1449	912.4505	1365.1765	11.1660	-44.2423
RF	92.4403	136.9155	16280.2714	20772.2527	11.1660	25.9078
HW	476.5141	907.6942	3388.9858	4754.4289	11.1660	-50.8768
ARIMA	134.6812	292.9861	16727.4768	21144.4220	11.1660	-32.2823
Prophet	951.4799	1456.9989	18831.0226	23806.2874	11.1660	-54.3303

- 比特幣全部歷史資料(測試集=20%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	299.1729	715.7188	1207.4761	1435.4923	-50.0142	30.1615
SVM	299.4418	720.6602	871.2547	1141.5552	-50.0142	44.1637
RF	282.9675	406.3982	5141.4172	5603.3220	-50.0142	13.5845
HW	1075.0056	2470.8969	2484.4030	3558.3361	-50.0142	4.9771
ARIMA	291.9234	720.4557	32147.3485	34092.6781	-50.0142	-16.5843
Prophet	2808.1543	4352.5959	59365.1517	64822.6680	-50.0142	-51.0586

- 比特幣全部歷史資料(測試集=10%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	361.7959	802.0467	374.0793	563.6780	32.5272	5.9714
SVM	364.9187	805.2678	378.3588	565.6379	32.5272	-3.3879

RF	307.6436	435.5870	1563.4940	1976.8621	32.5272	24.0570
HW	1328.2435	2781.3692	1642.7106	2173.1682	32.5272	-54.6753
ARIMA	357.9975	803.3335	5313.6661	6430.5176	32.5272	-5.4960
Prophet	2992.0678	4425.4472	8003.9794	9065.4144	32.5272	-0.8223

● 比特幣全部歷史資料(測試集=7)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	363.7813	782.1170	177.5363	260.7088	59.2500	113.9629
SVM	364.8807	785.2084	163.1277	256.4969	59.2500	113.9629
RF	299.8742	419.9437	202.1724	240.5839	59.2500	23.7546
HW	1362.6025	2728.9943	187.1406	229.2648	59.2500	135.6309
ARIMA	360.0922	783.4747	228.8358	293.9485	59.2500	-91.6634
Prophet	3392.8547	5151.0740	13743.3535	13747.5065	59.2500	-59.2500

● 比特幣歷史資料去除前兩年(測試集=30%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	349.8536	757.9405	861.0209	1204.8450	-2.6383	16.4954
SVM	347.2656	765.6565	1147.0644	1413.7620	-2.6383	37.2278
RF	266.5376	389.8285	5142.8048	5944.5961	-2.6383	30.0183
HW	1339.7939	2757.0381	2695.5066	3771.9016	-2.6383	-2.6391
ARIMA	347.4149	764.6884	10571.0182	12752.8289	-2.7898	16.0874
Prophet	3114.2710	4524.8053	64351.3929	73707.6464	-2.7898	11.3744

● 比特幣歷史資料去除前兩年(測試集=20%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	459.9930	917.6840	749.8365	934.1522	-29.6603	-29.4272
SVM	456.8791	922.3858	638.1438	841.7617	-29.6603	-13.4393
RF	325.9556	472.3749	6326.9336	6718.4269	-29.6603	41.5333
HW	1664.2842	3141.2639	2099.2234	2939.6406	-29.6603	-36.3475
ARIMA	455.2227	920.7802	19195.1458	20264.0526	-30.0224	1.9860
Prophet	2988.5762	4252.7395	20860.0738	21993.9635	-30.0224	-13.8101

● 比特幣歷史資料去除前兩年(測試集=10%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	478.3779	915.1068	466.9845	640.7243	49.1671	-25.0259
SVM	473.9315	918.9813	417.1298	598.7634	49.1671	-26.1085
RF	325.7061	461.8139	1154.5675	1462.9379	49.1671	14.4751
HW	1752.3951	3179.2223	1754.1013	2300.3094	49.1671	-62.7144
ARIMA	470.7024	917.8075	8184.3856	9297.3885	50.0854	3.0684
Prophet	3248.2623	4469.6431	18964.3080	22299.1754	50.0854	-54.5875

● 比特幣歷史資料去除前兩年(測試集=7)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	466.3863	888.7746	176.8809	261.0616	59.2500	113.9629
SVM	464.6195	893.0523	172.2085	259.1532	59.2500	67.7220
RF	316.0384	449.5560	162.7401	221.9851	59.2500	113.8724
HW	1756.9940	3105.7558	187.1406	229.2648	59.2500	135.6309

ARIMA	462.7511	890.2117	228.8358	293.9487	59.2500	-91.6634
Prophet	3973.1855	5347.9099	10765.1355	10768.8396	59.2500	-137.9043

● 比特幣歷史資料去除前四年(測試集=30%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	596.5676	1088.8634	844.3521	1058.4416	-16.7944	-24.0245
SVM	587.8500	1097.8551	822.4535	1022.7547	-16.7944	-24.6592
RF	363.8530	530.4038	7349.1592	7962.2961	-16.7944	2.2211
HW	2190.5232	3809.7067	2215.6589	3108.3053	-16.7944	-0.7767
ARIMA	593.2303	1113.2386	13089.3220	14422.1116	-14.2910	-14.8841
Prophet	3263.4717	4213.8655	27304.2607	28730.7826	-14.2910	36.7465

● 比特幣歷史資料去除前四年(測試集=20%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	625.5768	1101.3973	769.6357	996.3484	17.4142	-3.0056
SVM	617.3041	1107.4037	506.2214	694.7119	17.4142	-9.1893
RF	377.1698	535.6765	1705.6093	2197.4185	17.4142	5.9425
HW	2343.4300	3896.6292	1632.4026	2150.6341	17.4142	-57.7784
ARIMA	621.2062	1119.9366	4265.6570	4771.1281	24.0226	9.5865
Prophet	2276.6193	2906.8701	27912.5603	33176.1195	24.0226	-7.5644

● 比特幣歷史資料去除前四年(測試集=10%)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	592.6256	1055.5321	690.6409	852.5735	42.8174	-40.2788
SVM	587.4012	1060.3533	495.7383	669.7878	42.8174	-23.5622
RF	363.7260	521.5083	1354.5580	1617.7870	42.8174	18.6534
HW	2226.7828	3714.2035	1947.0890	2505.0841	42.8174	-107.8707
ARIMA	590.4307	1071.9694	5838.4346	6295.7907	40.7276	17.9969
Prophet	2391.3731	3148.3133	17139.3132	19127.4340	40.7276	53.2821

● 比特幣歷史資料去除前四年(測試集=7)

基礎模型	訓練集		測試集		實際收益	預期收益
	MAE	RMSE	MAE	RMSE		
LR	576.6509	1023.8132	166.1067	259.3265	59.2500	67.7220
SVM	572.9972	1027.7055	166.0129	239.2898	59.2500	67.7220
RF	346.8168	493.3013	195.3610	243.8312	59.2500	67.7220
HW	2206.2858	3616.5547	187.1406	229.2648	59.2500	135.6309

ARIMA	575.9716	1037.6511	229.0523	294.7772	59.2500	-91.6634
Prophet	2026.5089	2717.0845	2301.3280	2311.5153	59.2500	59.2500