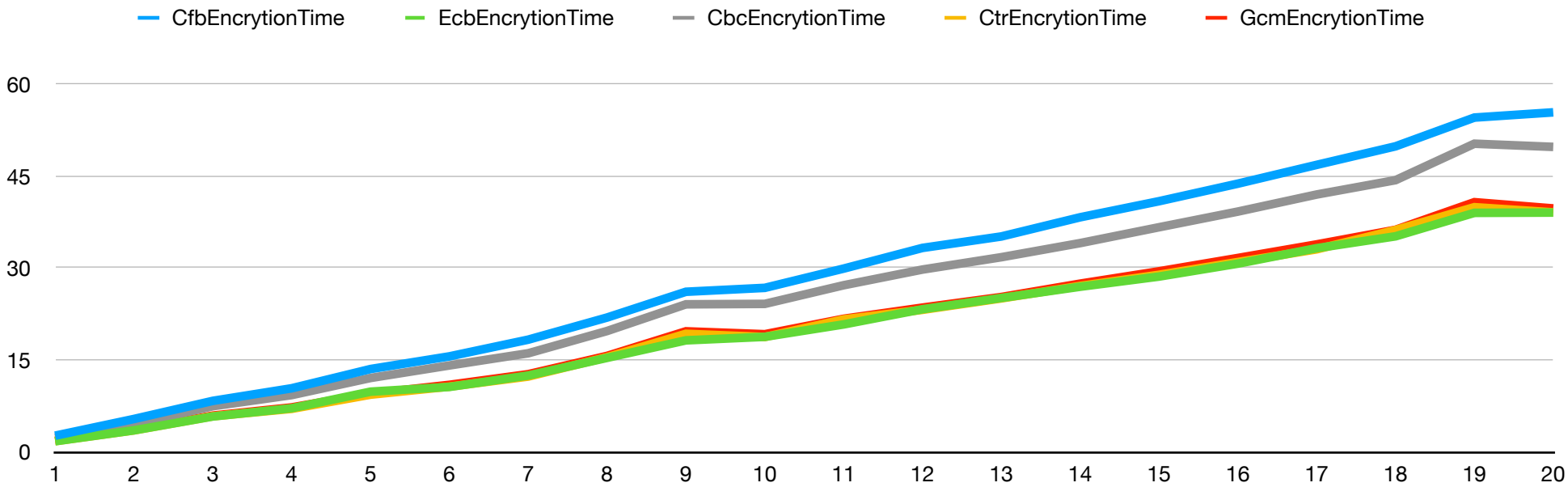
Encryption: The encryption time data is based from various algorithms (AES_CFB, AEC_ECB, AES_CBC, AES_CTR, AES_GCM) across multiple sizes (1 MB to 20 MB) and time consuming are in millisecond.

	CfbEncrytionTime	EcbEncrytionTime	CbcEncrytionTime	CtrEncrytionTime	GcmEncrytionTime
1	2.59644985198974609375	1.68335437774658203125	2.23984718322753906250	1.70011520385742187500	1.76794528961181640625
2	5.32851219177246093750	3.46848964691162109375	4.51042652130126953125	3.47309112548828125000	3.59017848968505859375
3	8.28909873962402343750	5.73647022247314453125	7.41415023803710937500	5.76910972595214843750	5.87737560272216796875
4	10.34681797027587890625	7.08348751068115234375	9.23264026641845703125	6.98757171630859375000	7.21683502197265625000
5	13.49115371704101562500	9.79120731353759765625	12.03017234802246093750	9.30345058441162109375	9.47308540344238281250
6	15.56129455566406250000	10.56671142578125000000	14.07911777496337890625	10.61096191406250000000	10.91012954711914062500
7	18.29538345336914062500	12.43185997009277343750	16.06807708740234375000	12.26565837860107421875	12.65010833740234375000
8	21.91264629364013671875	15.32068252563476562500	19.70784664154052734375	15.42739868164062500000	15.64078330993652343750
9	26.12421512603759765625	18.18025112152099609375	24.07262325286865234375	19.25122737884521484375	19.65711116790771484375
10	26.76384449005126953125	18.75495910644531250000	24.14391040802001953125	18.72518062591552734375	19.18513774871826171875
11	29.91185188293457031250	20.78537940979003906250	27.18994617462158203125	21.60730361938476562500	21.70748710632324218750
12	33.29243659973144531250	23.26703071594238281250	29.75664138793945312500	23.17342758178710937500	23.53408336639404296875
13	35.16550064086914062500	25.11305809020996093750	31.77394866943359375000	25.04327297210693359375	25.26462078094482421875
14	38.30163478851318359375	26.94876194000244140625	34.08200740814208984375	27.07562446594238281250	27.45249271392822265625
15	40.92888832092285156250	28.60939502716064453125	36.67171001434326171875	28.89816761016845703125	29.47051525115966796875
16	43.79997253417968750000	30.72249889373779296875	39.23463821411132812500	30.98459243774414062500	31.64737224578857421875
17	46.87194824218750000000	33.25071334838867187500	42.02518463134765625000	33.06734561920166015625	33.87041091918945312500
18	49.90401268005371093750	35.19020080566406250000	44.37210559844970703125	36.22136116027832031250	36.25574111938476562500
19	54.60493564605712890625	39.02597427368164062500	50.33121109008789062500	39.95273113250732421875	40.77179431915283203125
20	55.45911788940429687500	39.07322883605957031250	49.81117248535156250000	39.10448551177978515625	39.74678516387939453125
Ratio	2.64313340187073	1.86949372291565	2.3785662651062	1.87021851539612	1.89894199371338



1. **Performance Comparison**:

   - **CTR, GCM** and **ECB** consistently shows the fastest encryption times.
   - **CBC** has moderate performed.
   - **CFB** has least performances.

2. **Scalability**:

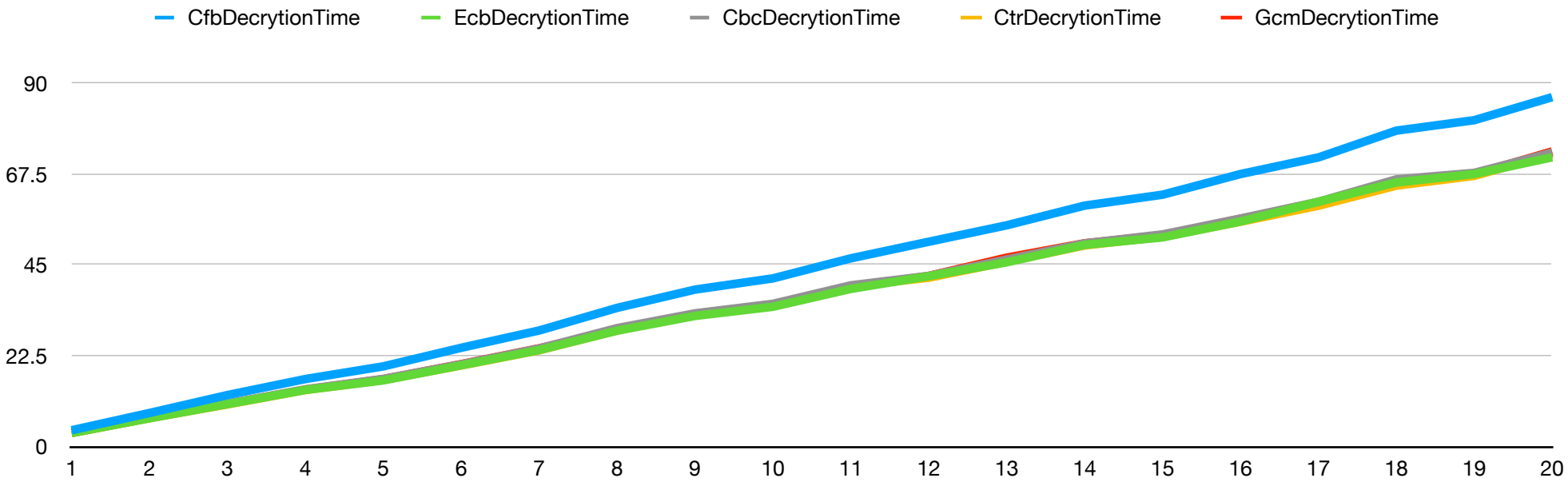
   - All modes show an increasing trend in encryption time as the size increases, which is expected. However, the rate of increase varies:
     - **CFB** has a ratio about 2.64313340187073
     - **ECB** has a ratio about 1.86949372291565
     - **CBC** has a ratio about 2.3785662651062
     - **CTR** has a ratio about 1.87021851539612
     - **GCM** has a ratio about 1.89894199371338

3. **Time Efficiency**:

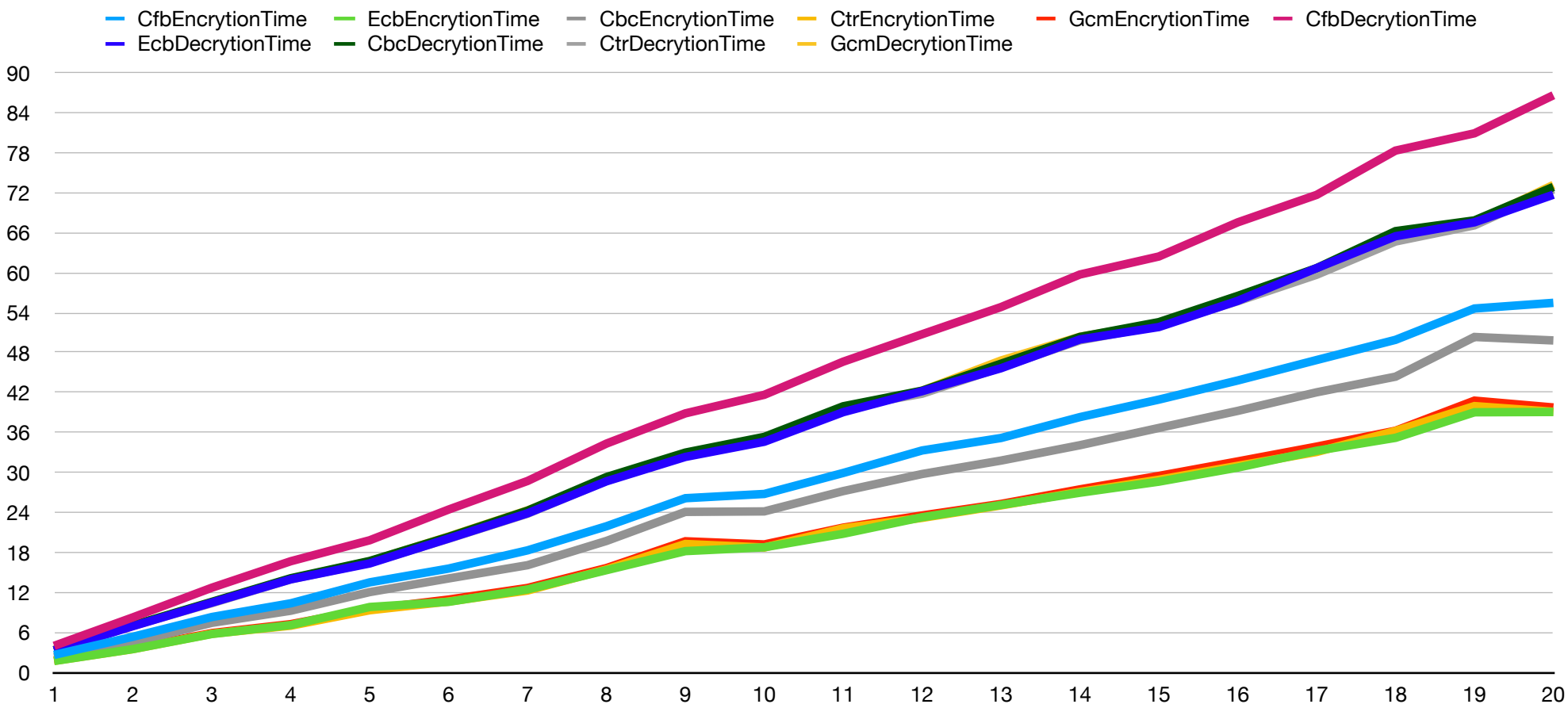
   - At the 20 MB size, the encryption times are about CFB: 55.46 ms, ECB: 39.07 ms, CBC: 49.81 ms, CTR: 39.10 ms and GCM: 39.75 ms.
   - Base on the performance of the time consuming, ECB, CTR and GCM not only perform faster overall but also remain more efficient with larger data sizes.

Decryption: The decryption time data is based from various algorithms (AES_CFB, AES_ECB, AES_CBC, AES_CTR, AES_GCM) across multiple sizes (1 MB to 20 MB) and time consuming are in millisecond.

	CfbDecrytionTime	EcbDecrytionTime	CbcDecrytionTime	CtrDecrytionTime	GcmDecrytionTime
1	3.95860671997070312500	3.26883792877197265625	3.31509113311767578125	3.26879024505615234375	3.30953598022460937500
2	8.24098587036132812500	6.91967010498046875000	7.05347061157226562500	6.97710514068603515625	6.99863433837890625000
3	12.69109249114990234375	10.44661998748779296875	10.56625843048095703125	10.36865711212158203125	10.50789356231689453125
4	16.66579246520996093750	13.94813060760498046875	14.11218643188476562500	13.94422054290771484375	14.03982639312744140625
5	19.81182098388671875000	16.33210182189941406250	16.70060157775878906250	16.42098426818847656250	16.64392948150634765625
6	24.42357540130615234375	20.07508277893066406250	20.31764984130859375000	20.03741264343261718750	20.36938667297363281250
7	28.71189117431640625000	23.85818958282470703125	24.25258159637451171875	23.79734516143798828125	24.29296970367431640625
8	34.32612419128417968750	28.66320610046386718750	29.30169105529785156250	28.71565818786621093750	28.78565788269042968750
9	38.86392116546630859375	32.32429027557373046875	32.97429084777832031250	32.75332450866699218750	32.84351825714111328125
10	41.65019989013671875000	34.60359573364257812500	35.33363342285156250000	34.73539352416992187500	35.21218299865722656250
11	46.62413597106933593750	39.04304504394531250000	39.92657661437988281250	39.69826698303222656250	39.43159580230712890625
12	50.74388980865478515625	42.19150543212890625000	42.26882457733154296875	41.81265830993652343750	42.26164817810058593750
13	54.82332706451416015625	45.63939571380615234375	46.31767272949218750000	45.75955867767333984375	46.79756164550781250000
14	59.71145629882812500000	49.96218681335449218750	50.34096240997314453125	49.82292652130126953125	50.36263465881347656250
15	62.41502761840820312500	51.82273387908935546875	52.56254673004150390625	52.01821327209472656250	52.36389636993408203125
16	67.54236221313476562500	55.75556755065917968750	56.49886131286621093750	55.70015907287597656250	56.45041465759277343750
17	71.66724205017089843750	60.67051887512207031250	60.67271232604980468750	59.67402458190917968750	60.37969589233398437500
18	78.31742763519287109375	65.45758247375488281250	66.22371673583984375000	64.66815471649169921875	65.39957523345947265625
19	80.90987205505371093750	67.54772663116455078125	67.83642768859863281250	67.09089279174804687500	67.50791072845458984375
20	86.62459850311279296875	71.69263362884521484375	72.85742759704589843750	72.48027324676513671875	73.15814495086669921875



1. **Performance Overview**:
    - **ECB, CTR, CBC** and **GCM** have the fastest decryption times overall.
    - **CFB** has the slowest decryption time.
2. **Scaling Behavior**:
    - All algorithms exhibit an increasing trend in decryption time as data size increases, which is expected.
        - **CFB** has a ratio about 4.1332995891571
        - **ECB** has a ratio about 3.42118978500366
        - **CBC** has a ratio about 3.47711682319641
        - **CTR** has a ratio about 3.46057415008545
        - **GCM** has a ratio about 3.4924304485321
3. **Time Efficiency at 20 MB**:
    - At 20 MB, the decryption times are approximately about CFB: 86.62 ms, ECB: 71.69 ms, CBC: 72.86 ms, CTR: 72.48 ms and GCM: 73.16 ms.
    - Base on the performance of the time consuming, ECB, CBC, CTR and GCM not only perform faster overall but also remain more efficient with larger data sizes.



Conclusion: As the figures shown, time consuming more as the data size increases. This is expected. On overall, ECB, CTR and GCM performance don't have much difference. ECB is insecure against EVA, CPA and CCA. CTR is secure against EVA and CPA. GCM is secure against EVA, CPA and CCA. Due to the performance and security, CTR and GCM would be recommended. CFB takes most of the time for encryption and decryption. One of the possible reason would be CFB is more like a stream cipher than the other four modes. This would be probably the reason why CFB has the highest cost. CTR and GCM have the best performance overall is quite surprising, because CTR and GCM have some extra step need to do compare to ECB and CBC. One of the probably reason is that the encryption and decryption process is not strongly dependent on the previous messages block. Another probably reason would be that the hardware has done some optimized processing. All tasks is performed on Apple Silicon M3 Max, which have provided the AES-IN. All the key, iv and none are prepare in advance. Only the encryption processing time and decryption processing time are in counter.