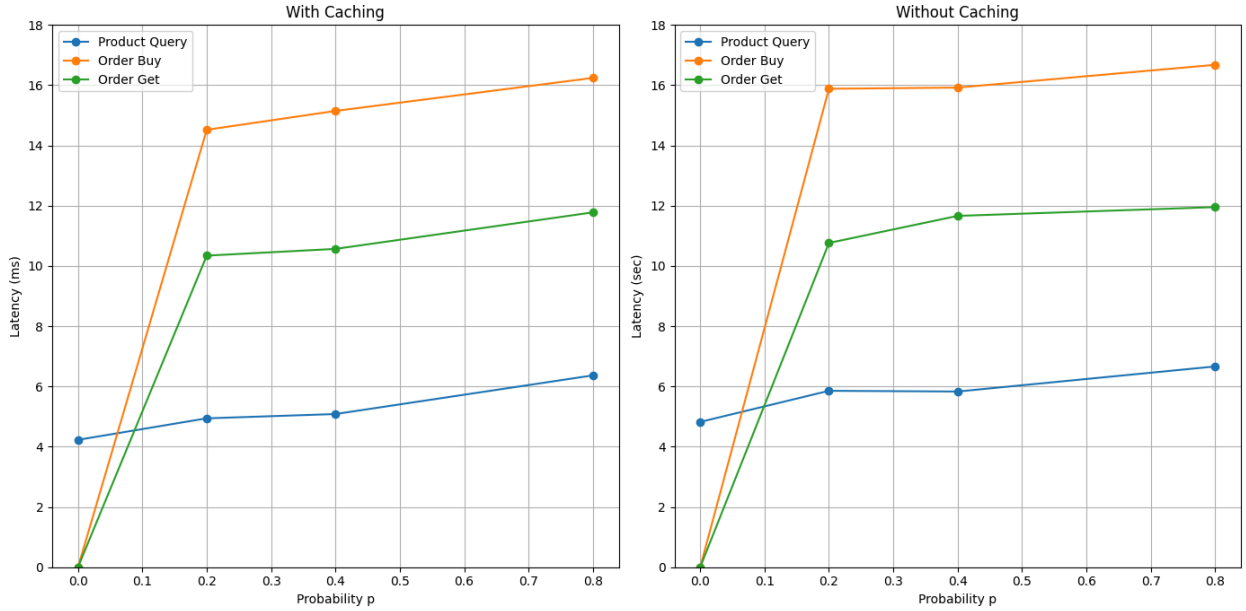
LATENCY EVALUATION DOCUMENT:

We run our 3 microservices and AWS and client on local. We run our client for ‘20’ iterations and vary the probability from 0 to 0.8 and measure latencies. We measure latency for 3 requests: product query, order buy and order get. We run 5 client instances concurrently on our local setup and the services on AWS to plot the graphs. We take the average of these latencies as latency is calculated for a single request so for 20 iterations and 5 clients we calculate the average via code (for 20 iterations) and manually (for 5 clients) and dump them in a table to plot the graphs.

Pls see spring24-lab3-spring24-lab3-shreya-simran\src\latencyCalc.ipynb for the code to plot graphs and calculate % improvement in latency using caching for our different requests for different values of p

Outputs:




```
Probability: 0.0, Request Type: Product Query, Improvement: 12.32%
Probability: 0.2, Request Type: Product Query, Improvement: 15.60%
Probability: 0.4, Request Type: Product Query, Improvement: 12.82%
Probability: 0.8, Request Type: Product Query, Improvement: 4.44%
Probability: 0.0, Request Type: Order Buy, Improvement: 0.00%
Probability: 0.2, Request Type: Order Buy, Improvement: 8.58%
Probability: 0.4, Request Type: Order Buy, Improvement: 4.86%
Probability: 0.8, Request Type: Order Buy, Improvement: 2.61%
Probability: 0.0, Request Type: Order Get, Improvement: 0.00%
Probability: 0.2, Request Type: Order Get, Improvement: 3.91%
Probability: 0.4, Request Type: Order Get, Improvement: 9.39%
Probability: 0.8, Request Type: Order Get, Improvement: 1.45%
```

		WITH CACHING						**WITHOUT CACHING**			
	p=0						p=0				
	client	product query	order buy	order get			client	product query	order buy	order get	
	5	4.22871	0	0			5	4.82267	0	0	
		WITH CACHING						**WITHOUT CACHING**			
	p=0.2						p=0.2				
	client	product query	order buy	order get			client	product query	order buy	order get	
	5	4.94261	14.52089	10.34376			5	5.85645	15.88343	10.76438	
		WITH CACHING						**WITHOUT CACHING**			
	p=0.4						p=0.4				
	client	product query	order buy	order get			client	product query	order buy	order get	
	5	5.08454	15.14781	10.56752			5	5.83243	15.92214	11.66326	
		WITH CACHING						**WITHOUT CACHING**			
	p=0.8						p=0.8				
	client	product query	order buy	order get			client	product query	order buy	order get	
	5	6.36845	16.24354	11.78032			5	6.66454	16.67835	11.95421	

Additionally, out of curiosity, we also evaluated the latencies when we vary the clients from 1-5 for different requests with and without caching. The results are as follows:

	WITH CACHING				WITHOUT CACHING			
p=0				p=0			
client	product query	order buy	order get	client	product query	order buy	order get
1	3.13569	0	0	1	3.34228	0	0
2	3.14023	0	0	2	3.39913	0	0
3	3.56713	0	0	3	3.73211	0	0
4	4.06112	0	0	4	4.13211	0	0
5	4.22871	0	0	5	4.82267	0	0
	WITH CACHING				WITHOUT CACHING		
p=0.2				p=0.2			
client	product query	order buy	order get	client	product query	order buy	order get
1	3.13764	12.18887	8.11528	1	3.15008	12.36871	9.00235
2	3.31179	12.64219	8.90023	2	3.51129	13.17863	9.46234
3	3.78611	13.00988	9.43299	3	4.06699	13.95622	10.34732
4	4.22965	13.82332	9.84374	4	4.71143	14.67823	10.96432
5	4.94261	14.52089	10.34376	5	5.85645	15.88343	12.76438
	WITH CACHING				WITHOUT CACHING		
p=0.4				p=0.4			
client	product query	order buy	order get	client	product query	order buy	order get
1	3.37658	12.34523	8.14795	1	3.88621	12.78943	9.00142
2	3.84372	12.69634	8.90567	2	3.99901	13.42431	9.73241
3	4.26743	13.44658	9.68347	3	4.69743	13.99843	10.49523
4	4.77895	14.68523	10.16871	4	5.24397	15.24314	10.74512
5	5.08454	15.14781	10.56752	5	5.83243	15.92214	11.66326
	WITH CACHING				WITHOUT CACHING		
p=0.8				p=0.8			
client	product query	order buy	order get	client	product query	order buy	order get
1	3.94159	12.88343	8.28134	1	4.14638	13.89432	8.68432
2	4.39763	13.45476	9.03264	2	4.64323	14.04358	8.87583
3	5.16435	14.17854	9.76734	3	5.24353	14.68932	9.22456
4	5.86524	14.95424	10.85324	4	6.09343	15.57835	9.46343
5	6.36845	16.24354	11.78032	5	6.66454	16.67835	9.95421