

CC Lab 2

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Section : C

Github link : https://github.com/Chaitu-03/CC_Lab2_PES1UG23CS157

Screenshots:

SS1:

The screenshot shows a web browser window for the 'Fest Monolith' application at localhost:8000/events?user=PES1UG23CS157. The page displays a grid of nine event cards. Each card includes an event ID, price, event name, a brief description, and a 'Register' button.

Event ID	Price	Event Name	Description	Action
1	₹ 500	Hackathon	Includes certificate • instant registration • limited seats	Register
2	₹ 300	Dance	Includes certificate • instant registration • limited seats	Register
3	₹ 500	Hackathon	Includes certificate • instant registration • limited seats	Register
4	₹ 300	Dance Battle	Includes certificate • instant registration • limited seats	Register
5	₹ 400	AI Workshop	Includes certificate • instant registration • limited seats	Register
6	₹ 200	Photography Walk	Includes certificate • instant registration • limited seats	Register
7	₹ 350	Gaming Tournament	Includes certificate • instant registration • limited seats	Register
8	₹ 250	Music Night	Includes certificate • instant registration • limited seats	Register
9	₹ 150	Treasure Hunt	Includes certificate • instant registration • limited seats	Register

SS2:

The screenshot shows a web browser window with the URL `localhost:8000/checkout`. The title bar says "Fest Monolith". The main content area has a red header "Monolith Failure" with a star icon. Below it, a message states: "One bug in one module impacted the entire application." A pink box contains the "Error Message": "division by zero". To the right, a red button says "HTTP 500". Below the error message, there are two sections: "Why did this happen?" (explaining it's a monolithic application) and "What should you do in the lab?" (listing tasks like taking a screenshot, fixing the bug, and restarting the server). At the bottom are "Back to Events" and "Login" buttons.

SS3:

The screenshot shows a web browser window with the URL `localhost:8000/checkout`. The title bar says "Fest Monolith". The main content area has a green header "Checkout". Below it, a message says: "This route is used to demonstrate a monolith crash + optimization." A white box displays "Total Payable" and "₹ 6600". Below this, a green box contains a checked checkbox: "After fixing + optimizing checkout logic, re-run Locust and compare results." To the right, a yellow box titled "What you should observe" lists: "One buggy feature can crash the entire monolith.", "Inefficient loops cause high response times under load.", and "Optimization improves performance but architecture still scales as one unit." It also includes a note: "Next Lab: Split this monolith into Microservices (Events / Registration / Checkout)."

SS4:

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OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS zsh + × ⌂ ⌂ ⌂ ⌂

```
> locust -f locust/checkout_locustfile.py
[2026-01-29 20:23:58,205] Chaitis-MacBook-Pro/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 20:23:58,208] Chaitis-MacBook-Pro/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 20:24:09,298] Chaitis-MacBook-Pro/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 20:24:09,299] Chaitis-MacBook-Pro/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T14:54:58Z
[2026-01-29 20:24:58,921] Chaitis-MacBook-Pro/INFO/locust.main: Shutting down (exit code 0)
```

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/checkout	20	0(0.00%)	4	1	21	3	0.68	0.00
	Aggregated	20	0(0.00%)	4	1	21	3	0.68	0.00

Response time percentiles (approximated)

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/checkout	4	4	7	7	9	22	22	22	22	22	22	20
	Aggregated	4	4	7	7	9	22	22	22	22	22	22	20

LOCUST Host http://localhost:8000 Status CLEANUP RPS 0.8 Failures 0% EDIT STOP RESET

STATISTICS CHARTS FAILURES EXCEPTIONS CURRENT RATIO DOWNLOAD DATA LOGS

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	20	0	3	22	22	4.48	2	22	2797	0.8	0
	Aggregated	20	0	3	22	22	4.48	2	22	2797	0.8	0

SS5:

PES1UG23CS157

OUTPUT DEBUG CONSOLE TERMINAL PORTS GITLENS zsh + × ⌂ ⌂ ⌂ ⌂

```
> locust -f locust/checkout_locustfile.py
[2026-01-29 20:21:05,057] Chaitis-MacBook-Pro/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 20:21:05,076] Chaitis-MacBook-Pro/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 20:21:28,025] Chaitis-MacBook-Pro/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 20:21:28,026] Chaitis-MacBook-Pro/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T14:52:15Z
[2026-01-29 20:22:15,254] Chaitis-MacBook-Pro/INFO/locust.main: Shutting down (exit code 0)
```

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/checkout	20	0(0.00%)	4	1	14	4	0.69	0.00
	Aggregated	20	0(0.00%)	4	1	14	4	0.69	0.00

Response time percentiles (approximated)

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/checkout	4	6	6	6	8	15	15	15	15	15	15	20
	Aggregated	4	6	6	6	8	15	15	15	15	15	15	20

LOCUST Host http://localhost:8000 Status CLEANUP RPS 0.7 Failures 0% EDIT STOP RESET

STATISTICS CHARTS FAILURES EXCEPTIONS CURRENT RATIO DOWNLOAD DATA LOGS

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/checkout	20	0	4	15	15	4.38	1	15	2797	0.7	0
	Aggregated	20	0	4	15	15	4.38	1	15	2797	0.7	0

SS6:

The screenshot shows the Locust terminal and web interface for a test labeled "SS6".

Terminal Output:

```
> locust -f locust/events_locustfile.py
[2026-01-29 20:27:43,116] Chaitis-MacBook-Pro/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 20:27:43,118] Chaitis-MacBook-Pro/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 20:27:53,820] Chaitis-MacBook-Pro/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 20:27:53,820] Chaitis-MacBook-Pro/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T14:58:39Z
[2026-01-29 20:28:39,328] Chaitis-MacBook-Pro/INFO/locust.main: Shutting down (exit code 0)
```

Aggregated Requests Table:

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/events?user=locust_user	20	0(0.00%)	109	94	128	110	0.69	0.00
	Aggregated	20	0(0.00%)	109	94	128	110	0.69	0.00

Response time percentiles (approximated) Table:

Type	Name	50%	66%	75%	80%	90%	95%	98%	99.9%	99.99%	100% # reqs
GET	/events?user=locust_user	110	110	120	120	130	130	130	130	130	20
	Aggregated	110	110	120	120	130	130	130	130	130	20

Locust Web Interface Statistics:

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/events?user=locust_user	20	0	110	130	109.36	94	128	21138	0.6	0
	Aggregated	20	0	110	130	109.36	94	128	21138	0.6	0

SS7:

The screenshot shows the Locust terminal and web interface for a test labeled "SS7".

Terminal Output:

```
> locust -f locust/events_locustfile.py
[2026-01-29 20:38:04,451] Chaitis-MacBook-Pro/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 20:38:04,453] Chaitis-MacBook-Pro/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 20:39:54,774] Chaitis-MacBook-Pro/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 20:39:54,774] Chaitis-MacBook-Pro/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T15:10:35Z
[2026-01-29 20:40:35,535] Chaitis-MacBook-Pro/INFO/locust.main: Shutting down (exit code 0)
```

Aggregated Requests Table:

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/events?user=locust_user	21	0(0.00%)	104	94	122	98	0.70	0.00
	Aggregated	21	0(0.00%)	104	94	122	98	0.70	0.00

Response time percentiles (approximated) Table:

Type	Name	50%	66%	75%	80%	90%	95%	98%	99.9%	99.99%	100% # reqs
GET	/events?user=locust_user	98	110	110	110	120	120	120	120	120	21
	Aggregated	98	110	110	110	120	120	120	120	120	21

Locust Web Interface Statistics:

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s
GET	/events?user=locust_user	21	0	98	120	104.29	95	123	21138	0.7	0
	Aggregated	21	0	98	120	104.29	95	123	21138	0.7	0

SS8:

Chaitu-03, 4 hours ago | 1 author (Chaitu-03)
PES1UG23CS157 Chaitu-03, 4 hours ago + PES1UG23CS157

TERMINAL

```
> locust -f locust/myevents_locustfile.py
[2026-01-29 20:47:38,437] Chaitis-MacBook-Pro/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 20:47:38,440] Chaitis-MacBook-Pro/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 20:47:47,242] Chaitis-MacBook-Pro/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 20:47:47,242] Chaitis-MacBook-Pro/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T15:18:57Z
[2026-01-29 20:48:57,557] Chaitis-MacBook-Pro/INFO/locust.main: Shutting down (exit code 0)
```

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/my-events?user=locust_user	20	0 (0.00%)	48	36	77	48	0.70	0.00
	Aggregated	20	0 (0.00%)	48	36	77	48	0.70	0.00

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/my-events?user=locust_user	50	53	55	55	65	78	78	78	78	78	78	20
	Aggregated	50	53	55	55	65	78	78	78	78	78	78	20

LOCUST

STATISTICS		CHARTS		FAILURES		EXCEPTIONS		CURRENT RATIO		DOWNLOAD DATA		LOGS		
Host	http://localhost:8000	Status	STOPPED	RPS	0.7	Failures	0%					NEW	RESET	⚙️
Request Statistics														
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s		
GET	/my-events?user=locust_user	20	0	48	78	78	48.99	36	78	3144	0.7	0		
	Aggregated	20	0	48	78	78	48.99	36	78	3144	0.7	0		

SS9:

PES1UG23CS157 Chaitu-03, 4 hours ago + PES1UG23CS157

TERMINAL

```
> locust -f locust/myevents_locustfile.py
[2026-01-29 20:46:08,946] Chaitis-MacBook-Pro/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 20:46:08,947] Chaitis-MacBook-Pro/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 20:46:17,409] Chaitis-MacBook-Pro/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 20:46:17,410] Chaitis-MacBook-Pro/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T15:17:11Z
[2026-01-29 20:47:11,939] Chaitis-MacBook-Pro/INFO/locust.main: Shutting down (exit code 0)
```

Type	Name	# reqs	# fails	Avg	Min	Max	Med	req/s	failures/s
GET	/my-events?user=locust_user	22	0 (0.00%)	48	35	65	48	0.74	0.00
	Aggregated	22	0 (0.00%)	48	35	65	48	0.74	0.00

Type	Name	50%	66%	75%	80%	90%	95%	98%	99%	99.9%	99.99%	100%	# reqs
GET	/my-events?user=locust_user	48	57	59	59	62	65	66	66	66	66	66	22
	Aggregated	48	57	59	59	62	65	66	66	66	66	66	22

LOCUST

STATISTICS		CHARTS		FAILURES		EXCEPTIONS		CURRENT RATIO		DOWNLOAD DATA		LOGS	
Host	http://localhost:8000	Status	CLEANUP	RPS	0.7	Failures	0%	EDIT	STOP	RESET	⚙️		
Request Statistics													
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)	Current RPS	Current Failures/s	
GET	/my-events?user=locust_user	22	0	48	65	66	48.6	35	66	3144	0.7	0	
	Aggregated	22	0	48	65	66	48.6	35	66	3144	0.7	0	

Answers

- 1) The bottle neck point was the nested loop and a double variable updation under `__init__.py` which was unnecessary and made the time complexity as $O(n^2)$.
- 2) This bottleneck issue of nested loop and double variable updation was resolved by only updating a single variable under a single looping condition, hence making the time complexity as $O(n)$.
- 3) Reduced time complexity: Changed from $O(n^2)$ to $O(n)$ - linear time instead of quadratic time.