CC LAB 2 - MONOLITHIC ARCHITECTURE

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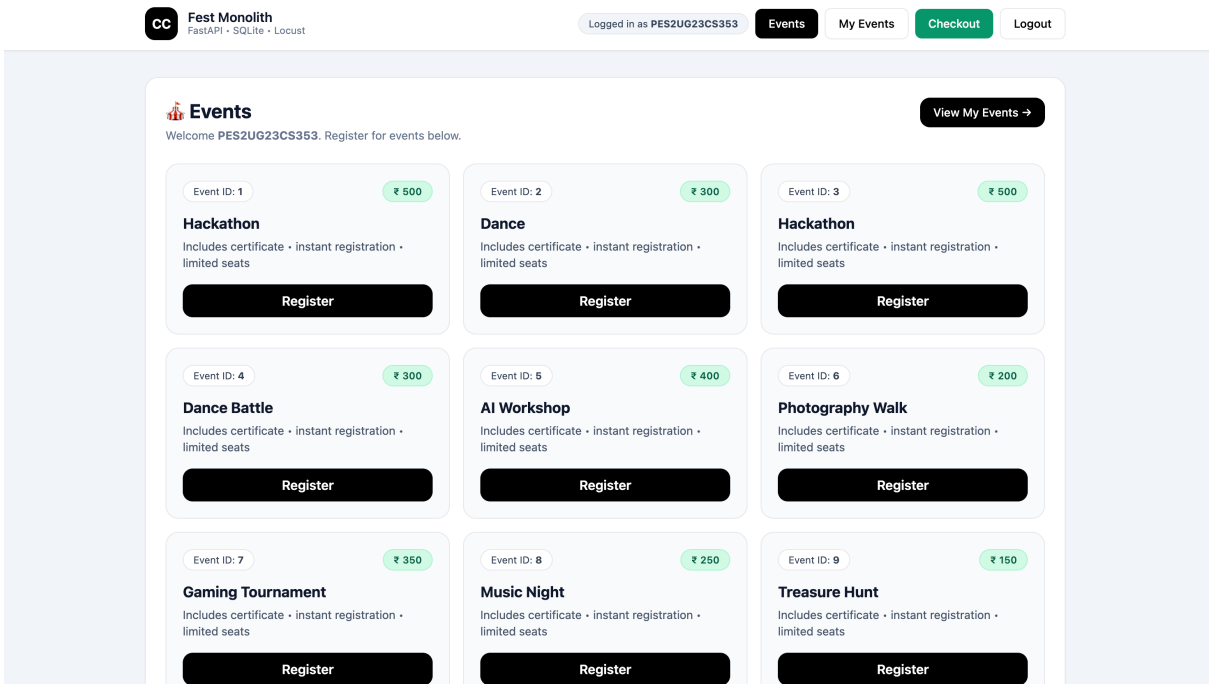
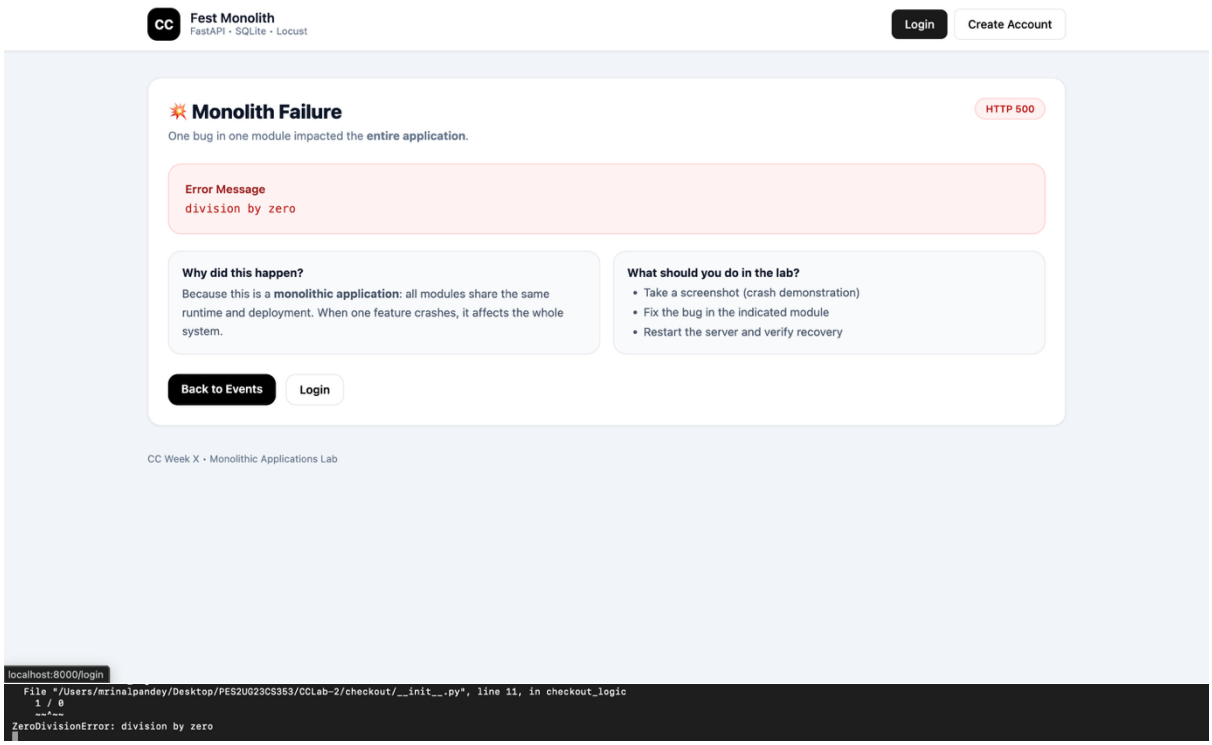
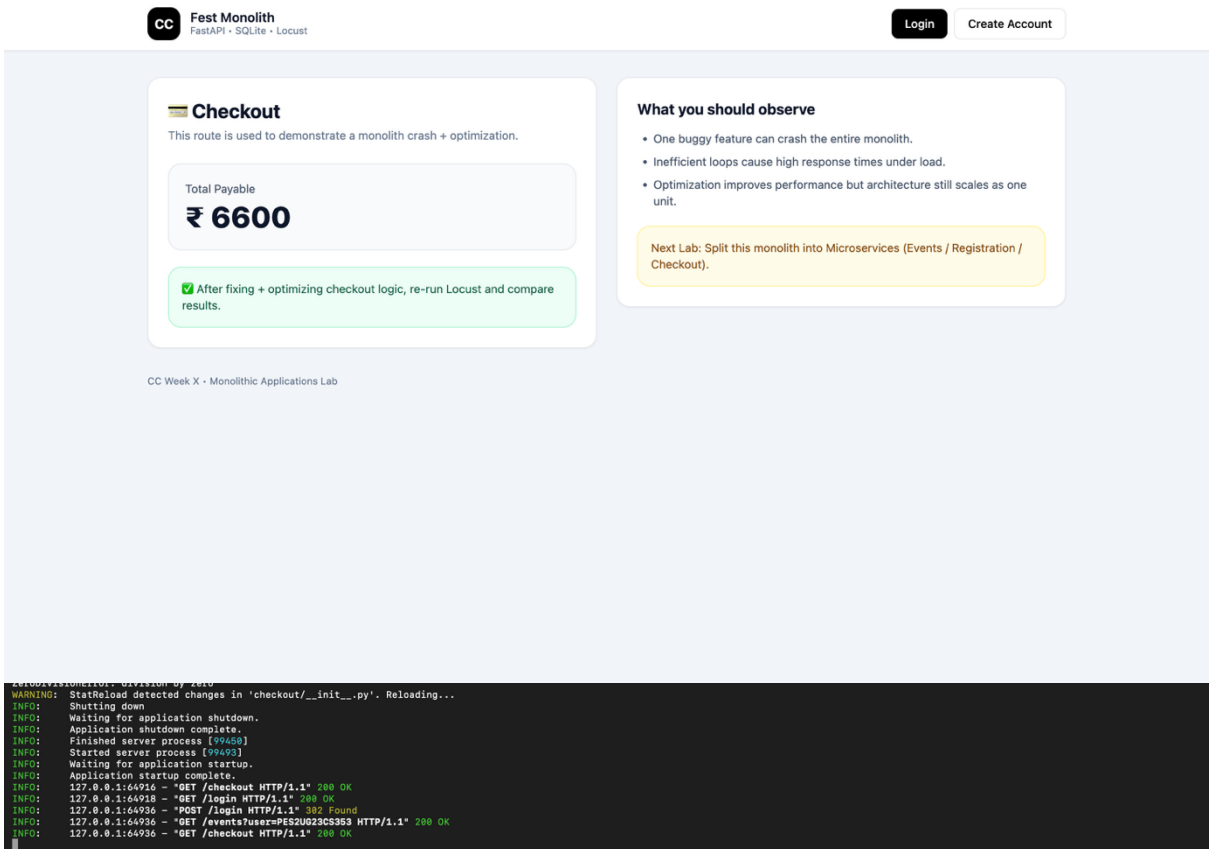
SS1



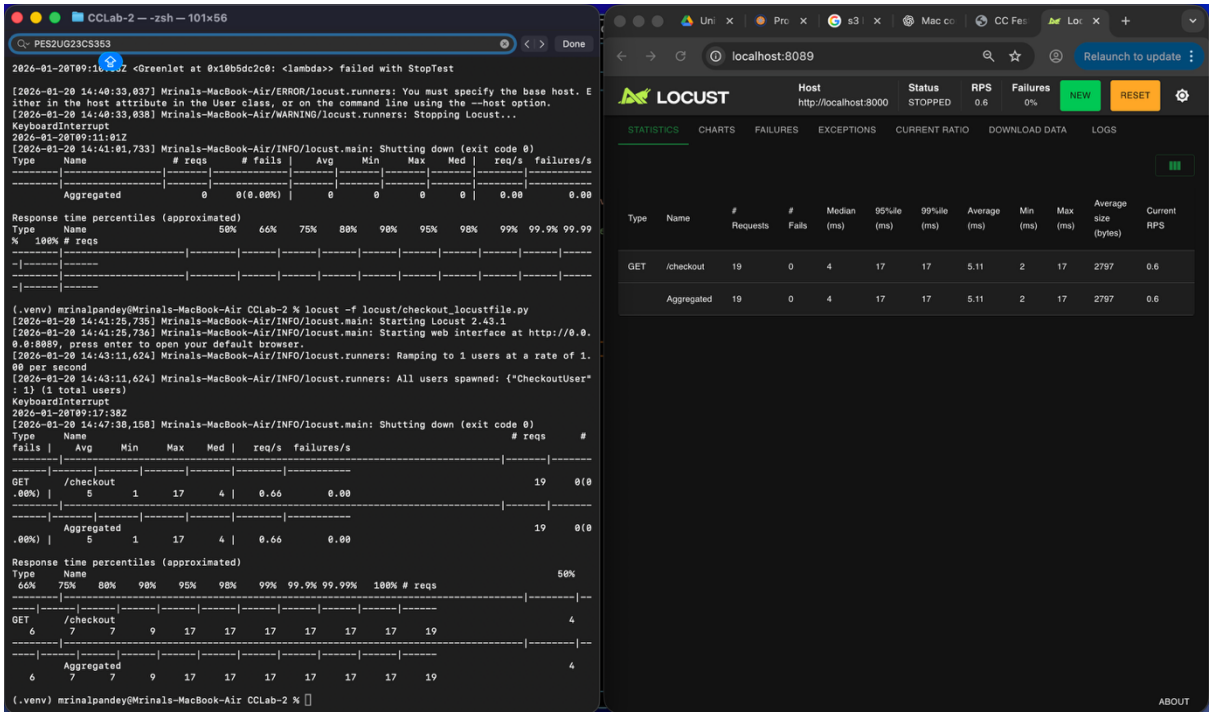
SS2



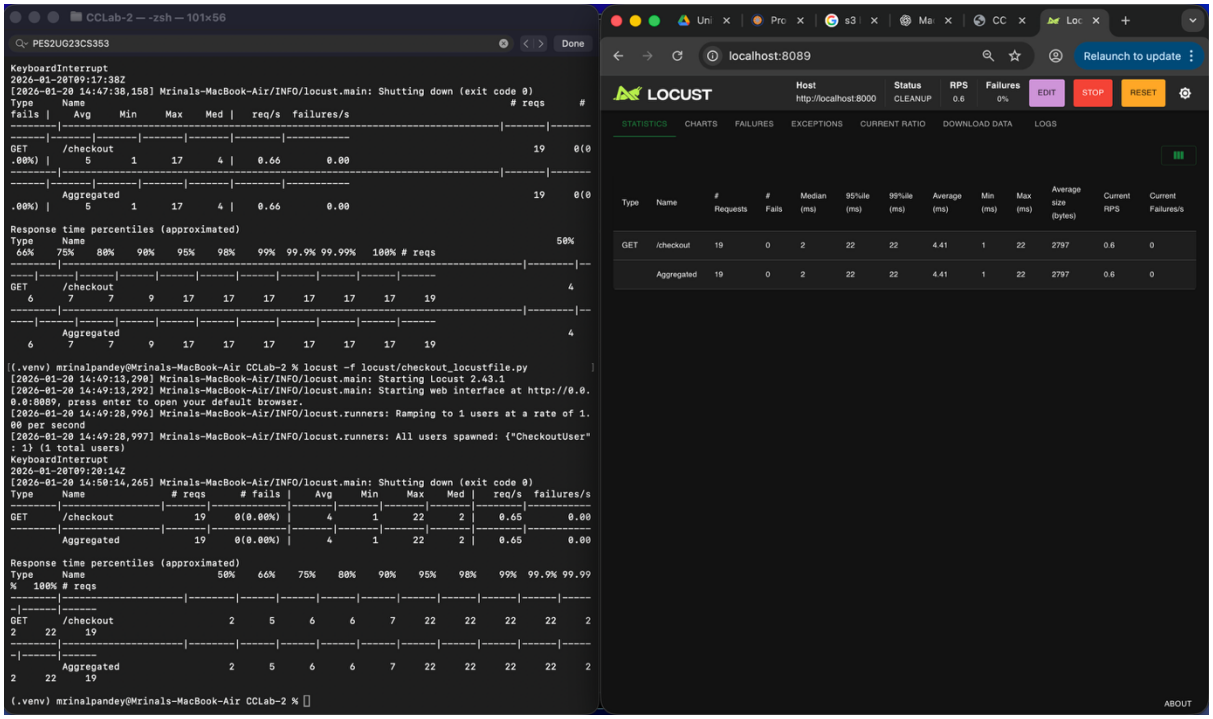
SS3


Fest Monolith
FastAPI • SQLite • Locust
Login
Create Account
Checkout
This route is used to demonstrate a monolith crash + optimization.
Total Payable
₹ 6600
✅ After fixing + optimizing checkout logic, re-run Locust and compare results.
What you should observe
One buggy feature can crash the entire monolith.
Inefficient loops cause high response times under load.
Optimization improves performance but architecture still scales as one unit.
Next Lab: Split this monolith into Microservices (Events / Registration / Checkout).
CC Week X • Monolithic Applications Lab
WARNING: StatReload detected changes in 'checkout/__init__.py'. Reloading...
INFO: Shutting down
INFO: Waiting for application shutdown.
INFO: Application shutdown complete.
INFO: Finished server process [99458]
INFO: Started server process [99493]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:64916 - "GET /checkout HTTP/1.1" 200 OK
INFO: 127.0.0.1:64918 - "GET /login HTTP/1.1" 200 OK
INFO: 127.0.0.1:64936 - "POST /login HTTP/1.1" 302 Found
INFO: 127.0.0.1:64936 - "GET /events?user=PES2UG23CS353 HTTP/1.1" 200 OK
INFO: 127.0.0.1:64936 - "GET /checkout HTTP/1.1" 200 OK

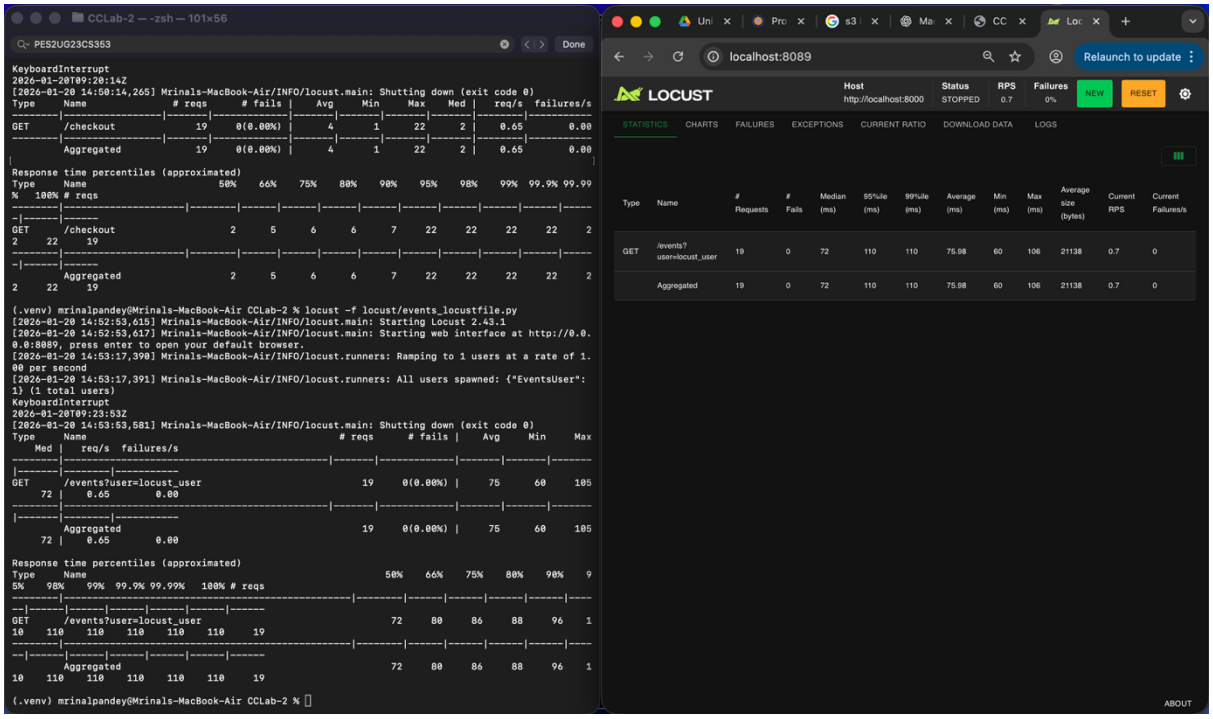
SS4


CCLab-2 — -zsh — 101×56
PES2UG23CS353
Done
2026-01-20T09:16:38Z <Greenlet at 0x10b5dc2c0: <lambda>> failed with StopTest
[2026-01-20 14:40:33,037] Mrinals-MacBook-Air/ERROR/locust.runners: You must specify the base host. Either in the host attribute in the User class, or on the command line using the --host option.
[2026-01-20 14:40:33,038] Mrinals-MacBook-Air/WARNING/locust.runners: Stopping Locust...
KeyboardInterrupt
2026-01-20T09:11:01Z
[2026-01-20 14:41:01,733] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
Aggregated 0 0(0.00%) | 0 0 0 0 | 0.00 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 % locust -f locust/checkout_locustfile.py
[2026-01-20 14:41:25,735] Mrinals-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:41:25,736] Mrinals-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-20 14:43:11,624] Mrinals-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:43:11,624] Mrinals-MacBook-Air/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
KeyboardInterrupt
2026-01-20T09:17:38Z
[2026-01-20 14:47:38,158] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
GET /checkout 19 0(0.00%) | 5 1 17 4 | 0.66 0.00
Aggregated 19 0(0.00%) | 5 1 17 4 | 0.66 0.00
GET /checkout 4 6 7 7 9 17 17 17 17 17 19
Aggregated 4 6 7 7 9 17 17 17 17 17 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 %
localhost:8089
Relaunch to update
LOCUST
Host http://localhost:8000
Status STOPPED
RPS 0.6
Failures 0%
NEW
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
GET /checkout 19 0 4 17 17 5.11 2 17 2797 0.6
Aggregated 19 0 4 17 17 5.11 2 17 2797 0.6
ABOUT

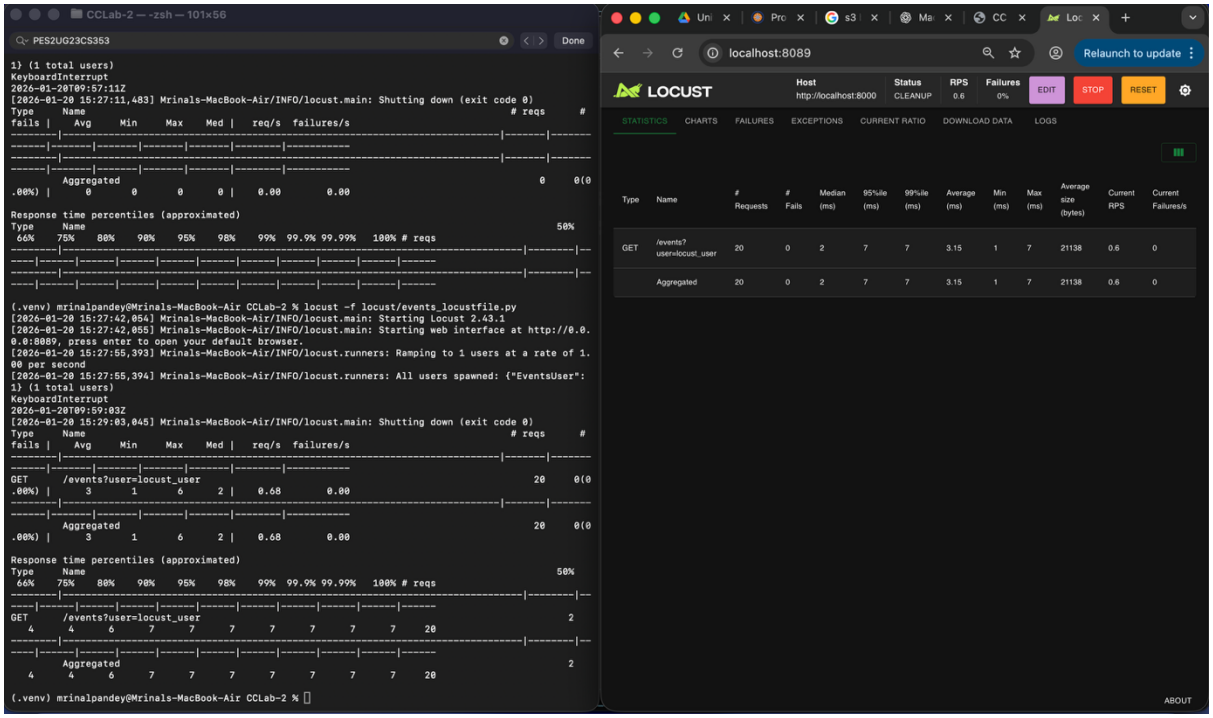
SS5


CCLab-2 — -zsh — 101×56
PES2UG23CS353
Done
KeyboardInterrupt
2026-01-20T09:17:38Z
[2026-01-20 14:47:38,158] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs #
fails | Avg Min Max Med | req/s failures/s
GET /checkout 19 0(0
.00%) | 5 1 17 4 | 0.66 0.00
Aggregated 19 0(0
.00%) | 5 1 17 4 | 0.66 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 7 7 9 17 17 17 17 17 19
Aggregated 4
6 7 7 9 17 17 17 17 17 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 % locust -f locust/checkout_locustfile.py
[2026-01-20 14:49:13,290] Mrinals-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:49:13,292] Mrinals-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-20 14:49:28,996] Mrinals-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:49:28,997] Mrinals-MacBook-Air/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
KeyboardInterrupt
2026-01-20T09:20:14Z
[2026-01-20 14:50:14,265] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /checkout 19 0(0.00%) | 4 1 22 2 | 0.65 0.00
Aggregated 19 0(0.00%) | 4 1 22 2 | 0.65 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /checkout 2 5 6 6 7 22 22 22 22 2 2 22 19
Aggregated 2 5 6 6 7 22 22 22 22 2 2 22 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 %
localhost:8089
Relaunch to update
LOCUST
Host http://localhost:8000
Status CLEANUP
RPS 0.6
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 19 0 2 22 22 4.41 1 22 2797 0.6 0
Aggregated 19 0 2 22 22 4.41 1 22 2797 0.6 0
ABOUT

SS6


CCLab-2 — -zsh — 101×56
PES2UG23CS353
Done
KeyboardInterrupt
2026-01-20T09:20:14Z
[2026-01-20 14:50:14,265] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /checkout 19 0(0.00%) | 4 1 22 2 | 0.65 0.00
Aggregated 19 0(0.00%) | 4 1 22 2 | 0.65 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /checkout 2 5 6 6 7 22 22 22 22 2 2 22 19
Aggregated 2 5 6 6 7 22 22 22 22 2 2 22 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 % locust -f locust/events_locustfile.py
[2026-01-20 14:52:53,615] Mrinals-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:52:53,617] Mrinals-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-20 14:53:17,390] Mrinals-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:53:17,391] Mrinals-MacBook-Air/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-20T09:23:53Z
[2026-01-20 14:53:53,581] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max
Med | req/s failures/s
GET /events?user=locust_user 19 0(0.00%) | 75 60 105
72 | 0.65 0.00
Aggregated 19 0(0.00%) | 75 60 105
72 | 0.65 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 9
5% 98% 99% 99.9% 99.99% 100% # reqs
GET /events?user=locust_user 72 80 86 88 96 1
10 110 110 110 110 110 19
Aggregated 72 80 86 88 96 1
10 110 110 110 110 110 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 %
localhost:8089
Relaunch to update
LOCUST
Host http://localhost:8000
Status STOPPED
RPS 0.7
Failures 0%
NEW
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 /events?user=locust_user 19 0 72 110 110 75.98 60 106 21138 0.7 0
Aggregated 19 0 72 110 110 75.98 60 106 21138 0.7 0
ABOUT

SS7

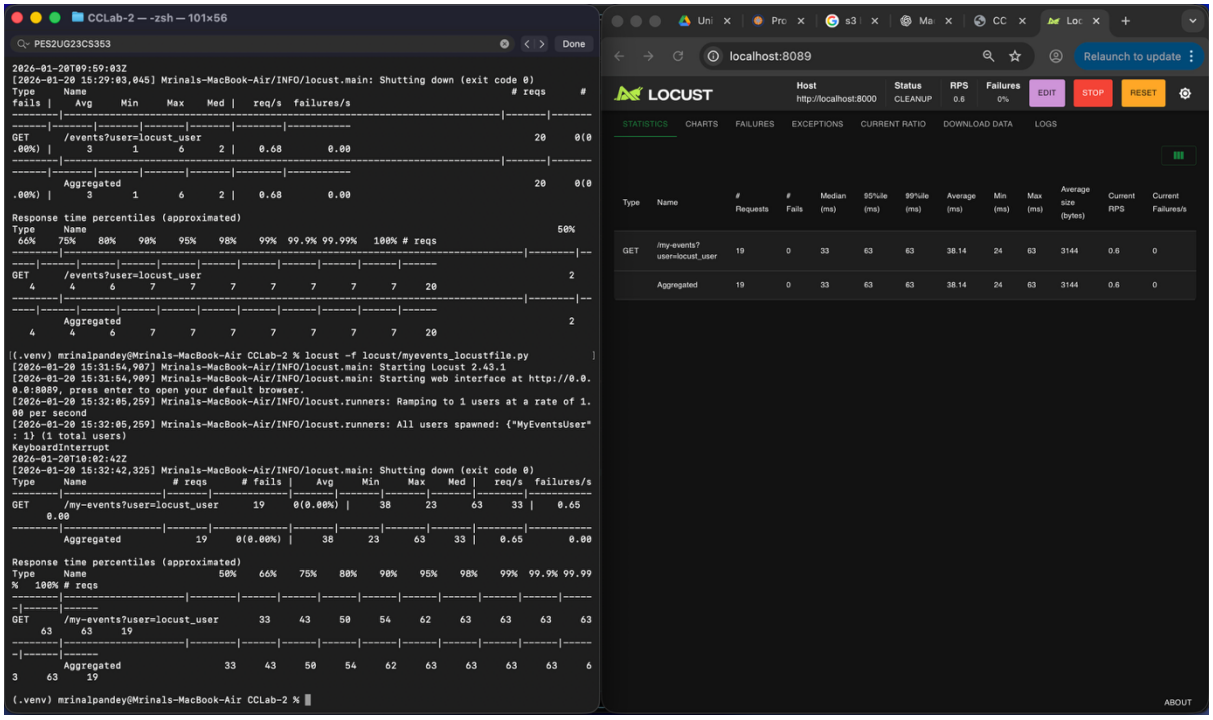


What was the bottleneck? The /events route in main.py contained an unnecessary CPU-intensive loop that executed millions of iterations on every request, even though it did not contribute to the actual functionality of displaying events.

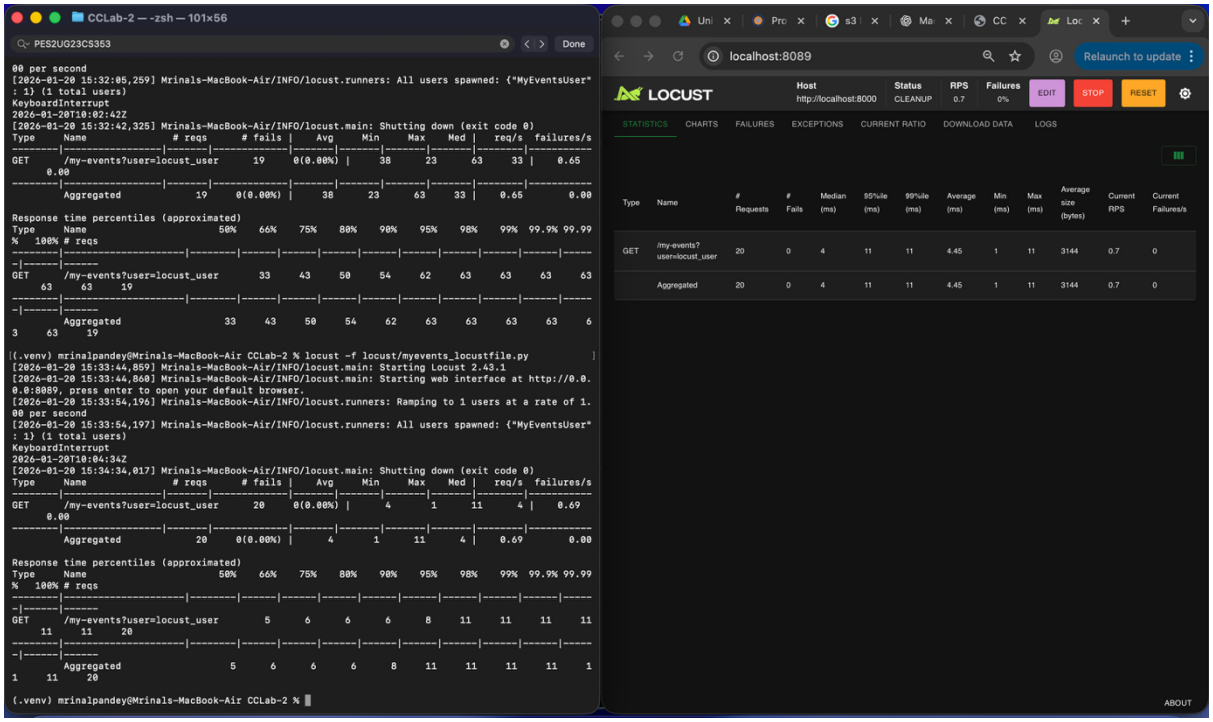
What change did you make? The redundant computation loop (“waste” loop)was removed so that the route only performs the required database query and template rendering.

Why did the performance improve? Removing the unnecessary CPU work reduced processing time per request, allowing the server to respond faster and handle load more efficiently under Locust testing.

SS8


CCLab-2 — -zsh — 101×56
PES2UG23CS353
Done
2026-01-20T09:59:03Z
[2026-01-20 15:29:03,045] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type Name # reqs # fails | Avg Min Max Med | req/s failures/s
GET /events?user=locust_user 20 0(0.00%) | 3 1 6 2 | 0.68 0.00
Aggregated 20 0(0.00%) | 3 1 6 2 | 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 /events?user=locust_user 2 4 4 6 7 7 7 7 7 7 20
Aggregated 2 4 4 6 7 7 7 7 7 7 20
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 % locust -f locust/myevents_locustfile.py
[2026-01-20 15:31:54,907] Mrinals-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:31:54,909] Mrinals-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-20 15:32:05,259] Mrinals-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:32:05,259] Mrinals-MacBook-Air/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-20T10:02:42Z
[2026-01-20 15:32:42,325] Mrinals-MacBook-Air/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 19 0(0.00%) | 38 23 63 33 | 0.65 0.00
Aggregated 19 0(0.00%) | 38 23 63 33 | 0.65 0.00
Response time percentiles (approximated)
Type Name 50% 66% 75% 80% 90% 95% 98% 99% 99.9% 99.99% 100% # reqs
GET /my-events?user=locust_user 33 43 50 54 62 63 63 63 63 63 19
Aggregated 33 43 50 54 62 63 63 63 63 63 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 %
localhost:8089
Relaunch to update
LOCUST
Host http://localhost:8000
Status CLEANUP
RPS 0.6
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 /my-events?user=locust_user 19 0 33 63 63 38.14 24 63 3144 0.6 0
Aggregated 19 0 33 63 63 38.14 24 63 3144 0.6 0
ABOUT

SS9


CCLab-2 — -zsh — 101×56
PES2UG23CS353
Done
00 per second
[2026-01-20 15:32:05,259] Mrinals-MacBook-Air/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-20T10:02:42Z
[2026-01-20 15:32:42,325] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
GET /my-events?user=locust_user 19 0(0.00%) | 38 23 63 33 | 0.65 0.00
Aggregated 19 0(0.00%) | 38 23 63 33 | 0.65 0.00
GET /my-events?user=locust_user 33 43 50 54 62 63 63 63 63 63 19
Aggregated 33 43 50 54 62 63 63 63 63 63 19
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 % locust -f locust/myevents_locustfile.py
[2026-01-20 15:33:44,859] Mrinals-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:33:44,860] Mrinals-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-20 15:33:54,196] Mrinals-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:33:54,197] Mrinals-MacBook-Air/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-20T10:04:34Z
[2026-01-20 15:34:34,017] Mrinals-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
GET /my-events?user=locust_user 20 0(0.00%) | 4 1 11 4 | 0.69 0.00
Aggregated 20 0(0.00%) | 4 1 11 4 | 0.69 0.00
GET /my-events?user=locust_user 5 6 6 6 8 11 11 11 11 11 20
Aggregated 5 6 6 6 8 11 11 11 11 11 20
(.venv) mrinalpandey@Mrinals-MacBook-Air CCLab-2 %
localhost:8089
Relaunch to update
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 /my-events?user=locust_user 20 0 4 11 11 4.45 1 11 3144 0.7 0
Aggregated 20 0 4 11 11 4.45 1 11 3144 0.7 0
ABOUT

What was the bottleneck?

The /my-events route included an artificial delay caused by a large loop that performed time consuming operations on every request, increasing response time.

What change did you make?

The artificial loop was eliminated(“dummy loop”), keeping only the database query and response generation logic.

Why did the performance improve?

By eliminating the redundant computation, the route required fewer CPU cycles per request, resulting in lower average response time and improved overall performance during load testing.