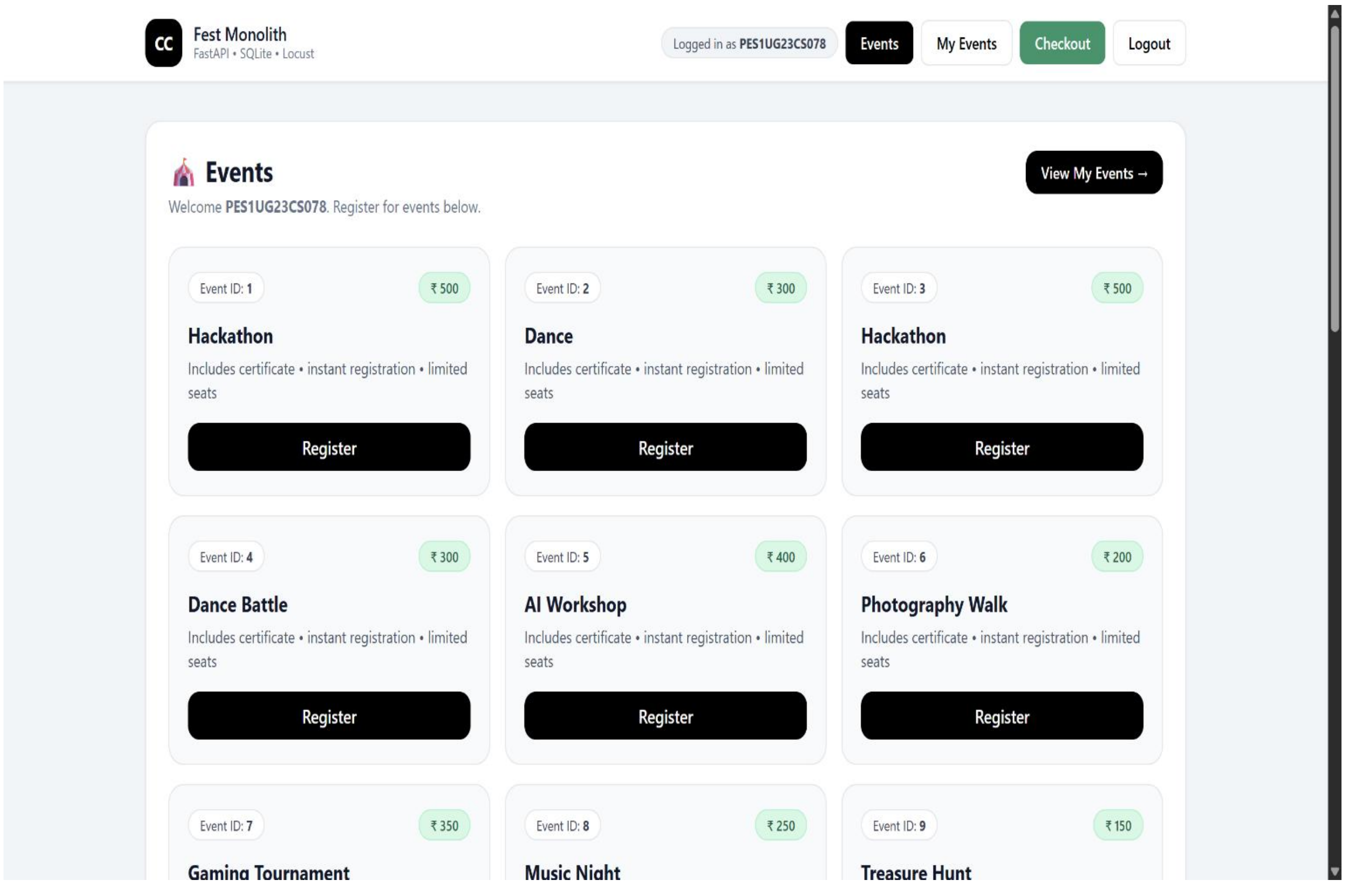
LAB 2 - MONOLITHIC ARCHITECTURE

NAME : ANISH M
SRN : PES1UG23CS078
SECTION : B
GIT URL : https://github.com/AnishM0605/CC-Lab-2-PES1UG23CS078/tree/main

SS1 :



CC Fest Monolith
FastAPI • SQLite • Locust

Logged in as PES1UG23CS078 | Events | My Events | Checkout | Logout

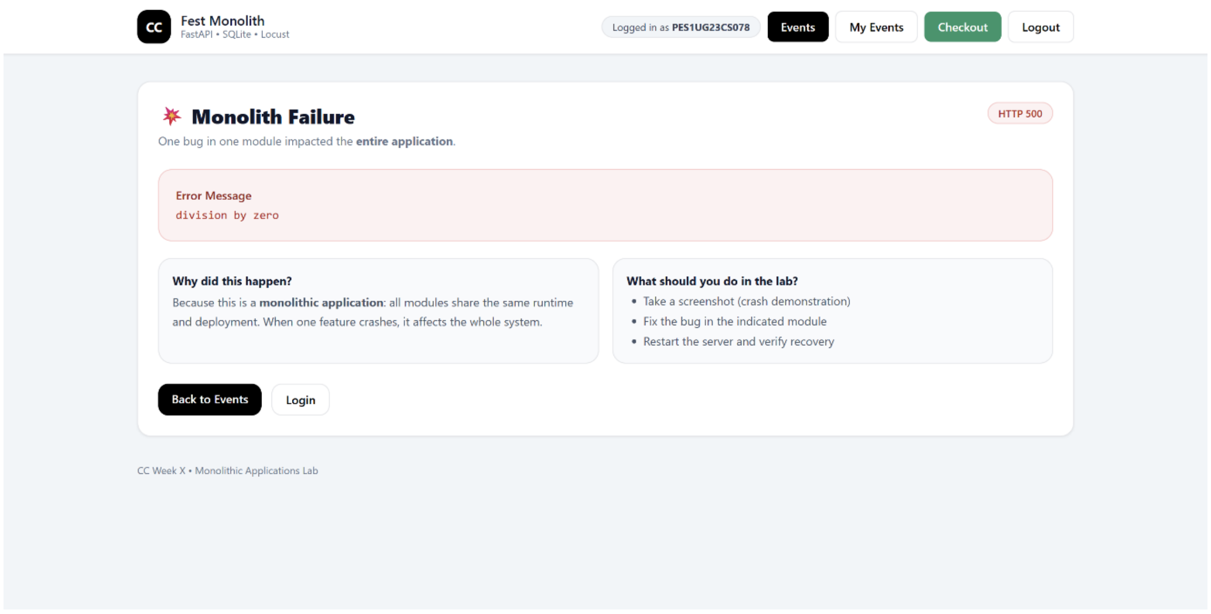
Events

View My Events →

Welcome PES1UG23CS078. Register for events below.

Event ID	Price	Event	Description	
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		
8	₹ 250	Music Night		
9	₹ 150	Treasure Hunt		

SS2 :



Monolith Failure

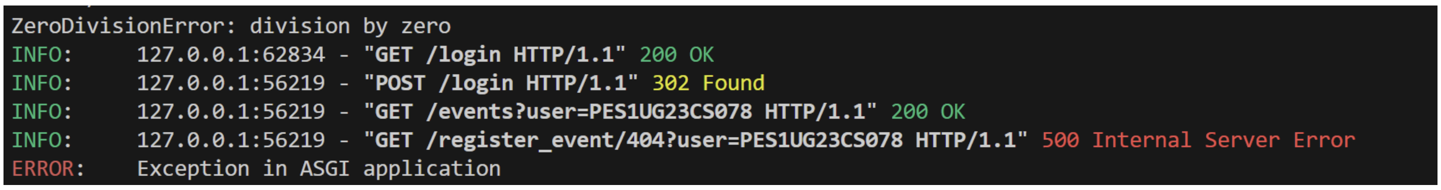
One bug in one module impacted the **entire application**.

Error Message
`division by zero`

Why did this happen?
Because this is a **monolithic application**: all modules share the same runtime and deployment. When one feature crashes, it affects the whole system.

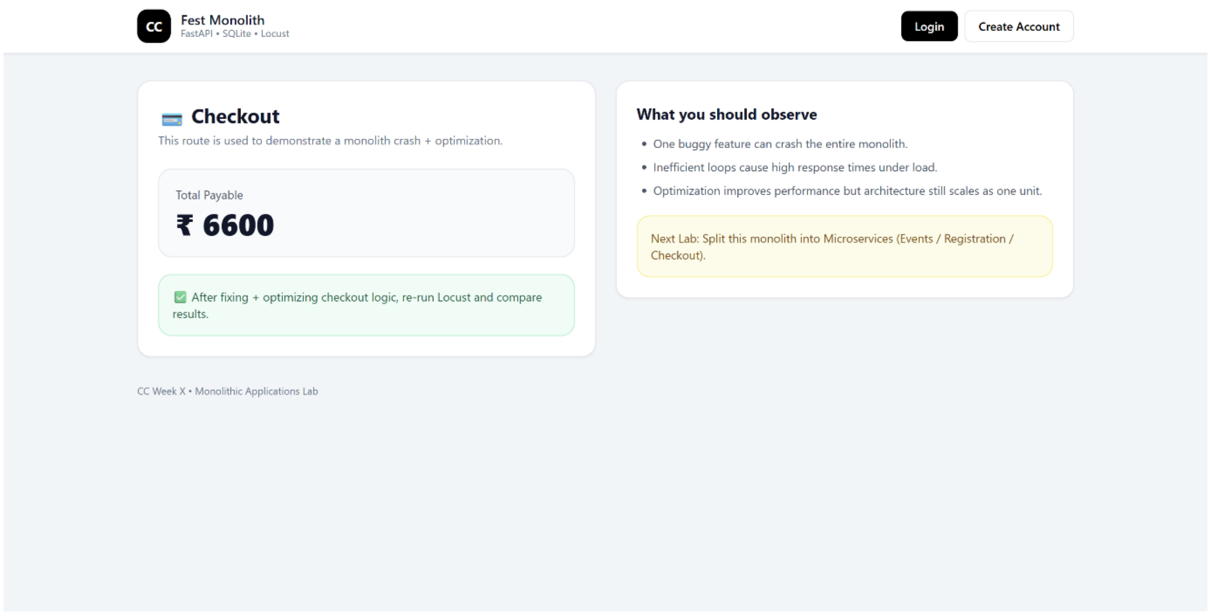
What should you do in the lab?
- Take a screenshot (crash demonstration)
- Fix the bug in the indicated module
- Restart the server and verify recovery

CC Week X • Monolithic Applications Lab



```
ZeroDivisionError: division by zero
INFO:     127.0.0.1:62834 - "GET /login HTTP/1.1" 200 OK
INFO:     127.0.0.1:56219 - "POST /login HTTP/1.1" 302 Found
INFO:     127.0.0.1:56219 - "GET /events?user=PES1UG23CS078 HTTP/1.1" 200 OK
INFO:     127.0.0.1:56219 - "GET /register_event/404?user=PES1UG23CS078 HTTP/1.1" 500 Internal Server Error
ERROR:    Exception in ASGI application
```

SS3 :


CC Fest Monolith
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Login   Create Account

Checkout

This route is used to demonstrate a monolith crash + optimization.

Total Payable

₹ 6600

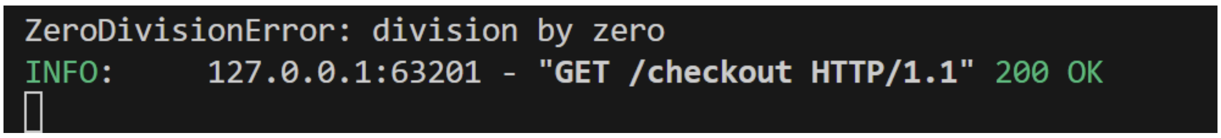
✓ After fixing + optimizing checkout logic, re-run Locust and compare results.

What you should observe

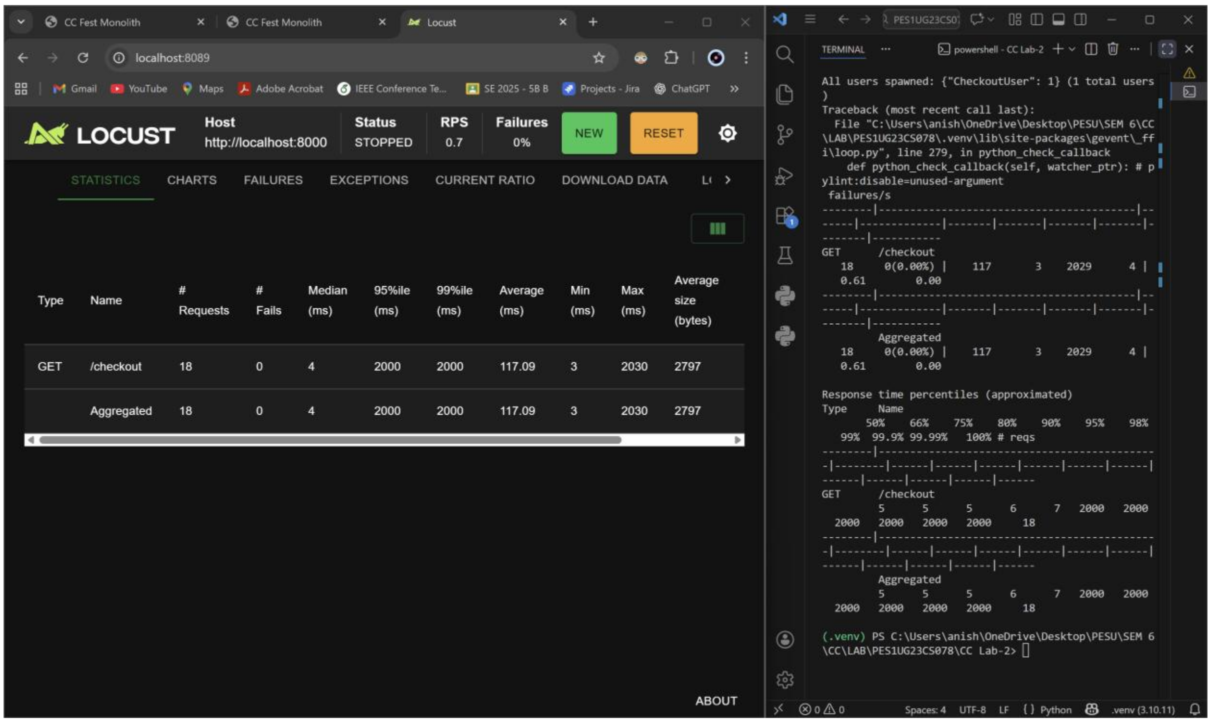
- One buggy feature can crash the entire monolith.
- Inefficient loops cause high response times under load.
- Optimization improves performance but architecture still scales as one unit.

Next Lab: Split this monolith into Microservices (Events / Registration / Checkout).

CC Week X • Monolithic Applications Lab


```
ZeroDivisionError: division by zero
INFO:     127.0.0.1:63201 - "GET /checkout HTTP/1.1" 200 OK
```

SS4 :



Host	Status	RPS	Failures
http://localhost:8000	STOPPED	0.7	0%

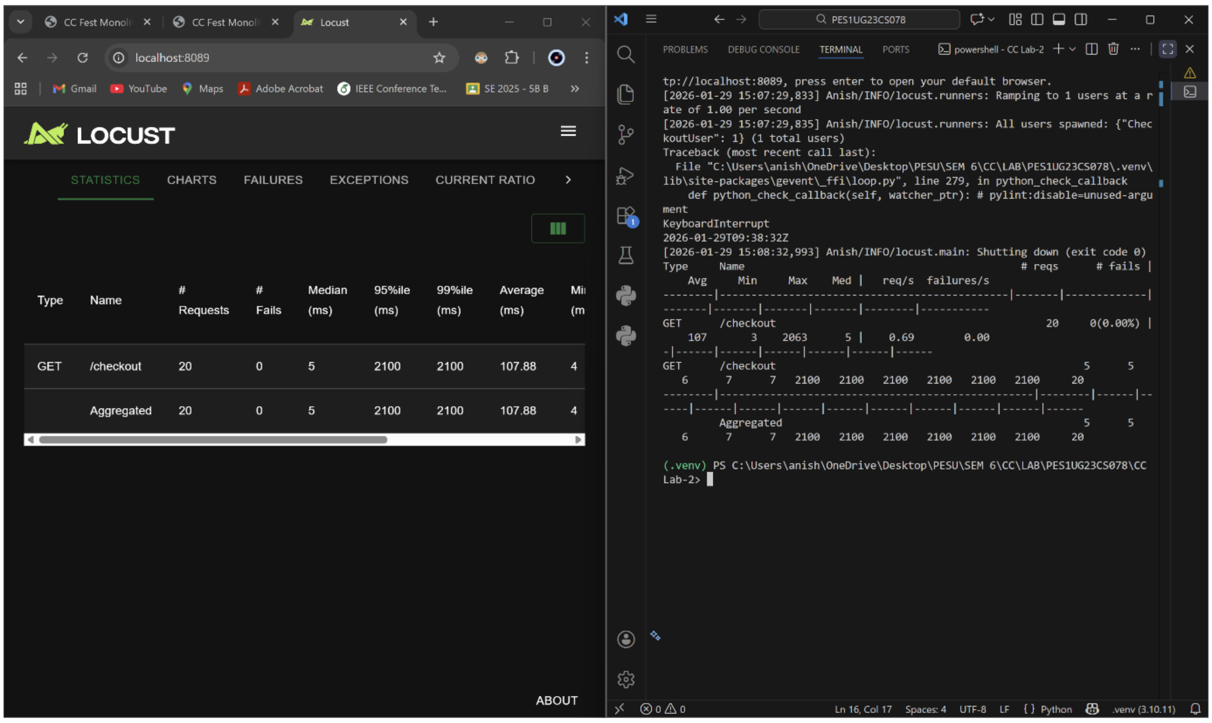
Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Min (ms)	Max (ms)	Average size (bytes)
GET	/checkout	18	0	4	2000	2000	117.09	3	2030	2797
	Aggregated	18	0	4	2000	2000	117.09	3	2030	2797

```
All users spawned: {"CheckoutUser": 1} (1 total users
)
Traceback (most recent call last):
  File "C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC
\LAB\PES1UG23CS078\.venv\lib\site-packages\gevent\_ff
i\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # p
ylint:disable=unused-argument
 failures/s
--------|--------------------------------------------|--
-----|-------------|-------|-------|-------|-------|-
-------|-----------
GET      /checkout
   18     0(0.00%) |    117       3    2029      4 |
   0.61       0.00
--------|--------------------------------------------|--
-----|-------------|-------|-------|-------|-------|-
-------|-----------
         Aggregated
   18     0(0.00%) |    117       3    2029      4 |
   0.61       0.00

Response time percentiles (approximated)
Type     Name
       50%    66%    75%    80%    90%    95%    98%
   99%  99.9% 99.99%   100% # reqs
--------|--------------------------------------------
-|--------|------|------|------|------|------|------|
------|------|------|------|------
GET      /checkout
         5      5      5      6      7   2000   2000
  2000   2000   2000   2000     18
--------|--------------------------------------------
-|--------|------|------|------|------|------|------|
------|------|------|------|------
         Aggregated
         5      5      5      6      7   2000   2000
  2000   2000   2000   2000     18

(.venv) PS C:\Users\anish\OneDrive\Desktop\PESU\SEM 6
\CC\LAB\PES1UG23CS078\CC Lab-2>
```

SS5 :

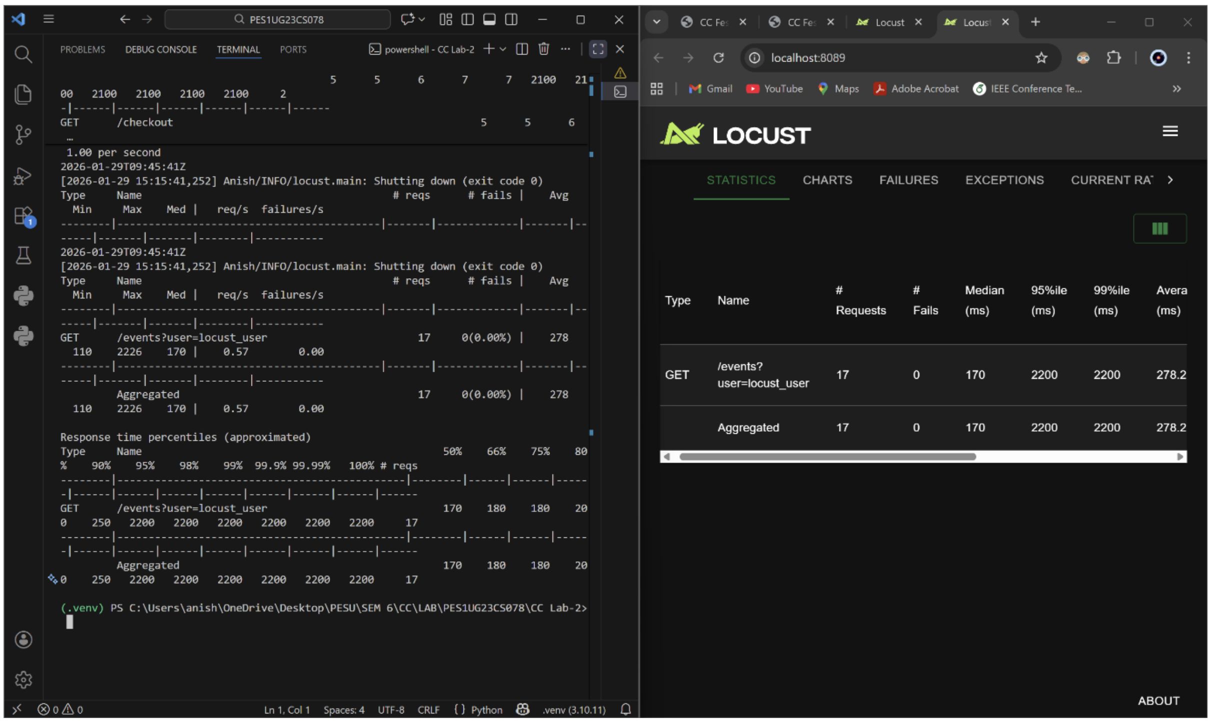


Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Mi (m
GET	/checkout	20	0	5	2100	2100	107.88	4
	Aggregated	20	0	5	2100	2100	107.88	4

```
tp://localhost:8089, press enter to open your default browser.
[2026-01-29 15:07:29,833] Anish/INFO/locust.runners: Ramping to 1 users at a r
ate of 1.00 per second
[2026-01-29 15:07:29,835] Anish/INFO/locust.runners: All users spawned: {"Chec
koutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\.venv\
lib\site-packages\gevent\_ffi\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argu
ment
KeyboardInterrupt
2026-01-29T09:38:32Z
[2026-01-29 15:08:32,993] Anish/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%) |
    107       3    2063      5 |    0.69        0.00
-|------|------|------|------|------|------
GET      /checkout                                               5      5
   6      7      7   2100   2100   2100   2100   2100   2100     20
--------|------------------------------------------------|--------|------|--
----|------|------|------|------|------|------|------|------|------
         Aggregated                                              5      5
   6      7      7   2100   2100   2100   2100   2100   2100     20

(.venv) PS C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\CC
Lab-2> 
```

SS6 :



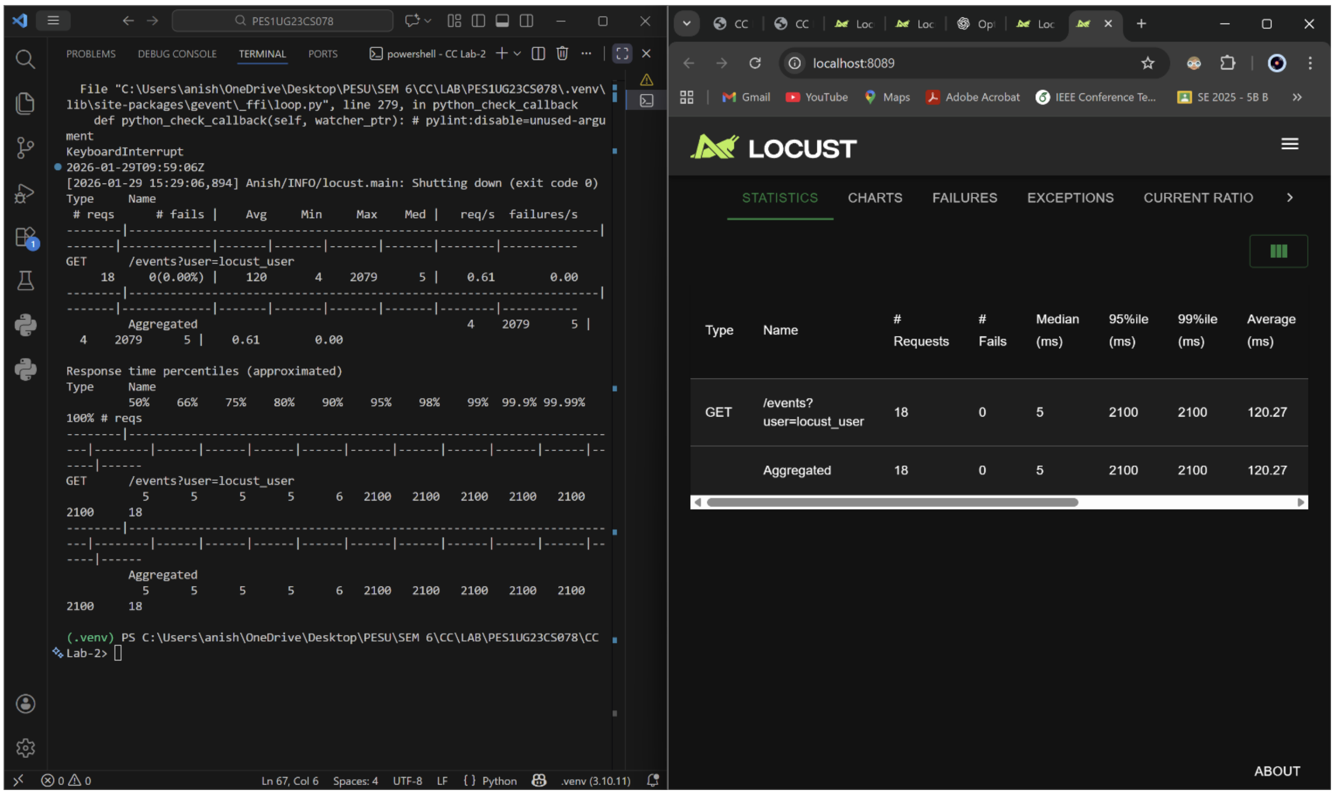
```
                                                        5       5       6       7       7    2100    21
00    2100    2100    2100    2100      2
-|------|------|------|------|------|------
GET      /checkout                                                      5       5       6
 …
 1.00 per second
2026-01-29T09:45:41Z
[2026-01-29 15:15:41,252] Anish/INFO/locust.main: Shutting down (exit code 0)
Type     Name                                          # reqs      # fails |    Avg
  Min      Max    Med |   req/s  failures/s
--------|------------------------------------------|-------|-------------|-------|--
-----|-------|-------|--------|-----------
2026-01-29T09:45:41Z
[2026-01-29 15:15:41,252] Anish/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                          17     0(0.00%) |    278
  110    2226    170 |    0.57       0.00
--------|------------------------------------------|-------|-------------|-------|--
-----|-------|-------|--------|-----------
         Aggregated                                        17     0(0.00%) |    278
  110    2226    170 |    0.57       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                              170    180    180    20
0    250   2200   2200   2200   2200   2200   2200     17
--------|----------------------------------------------|--------|------|------|-----
-|------|------|------|------|------|------|------|------
         Aggregated                                            170    180    180    20
0    250   2200   2200   2200   2200   2200   2200     17

(.venv) PS C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\CC Lab-2>
```

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Avera (ms)
GET	/events?user=locust_user	17	0	170	2200	2200	278.2
	Aggregated	17	0	170	2200	2200	278.2

SS7 :



```
  File "C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\.venv\
lib\site-packages\gevent\_ffi\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argu
ment
KeyboardInterrupt
2026-01-29T09:59:06Z
[2026-01-29 15:29:06,894] Anish/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
     18     0(0.00%) |    120       4    2079      5 |    0.61        0.00
--------|----------------------------------------------------------------------|
-------|------------|-------|-------|-------|-------|--------|-----------
         Aggregated                                        4    2079      5 |
  4    2079      5 |    0.61        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
           5      5      5      5      6   2100   2100   2100   2100   2100
2100     18
--------|------------------------------------------------------------------------
---|--------|------|------|------|------|------|------|------|------|------|--
----|------
         Aggregated
           5      5      5      5      6   2100   2100   2100   2100   2100
2100     18

(.venv) PS C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\CC
Lab-2>
```

localhost:8089

LOCUST

STATISTICS CHARTS FAILURES EXCEPTIONS CURRENT RATIO

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)
GET	/events?user=locust_user	18	0	5	2100	2100	120.27
	Aggregated	18	0	5	2100	2100	120.27

ABOUT

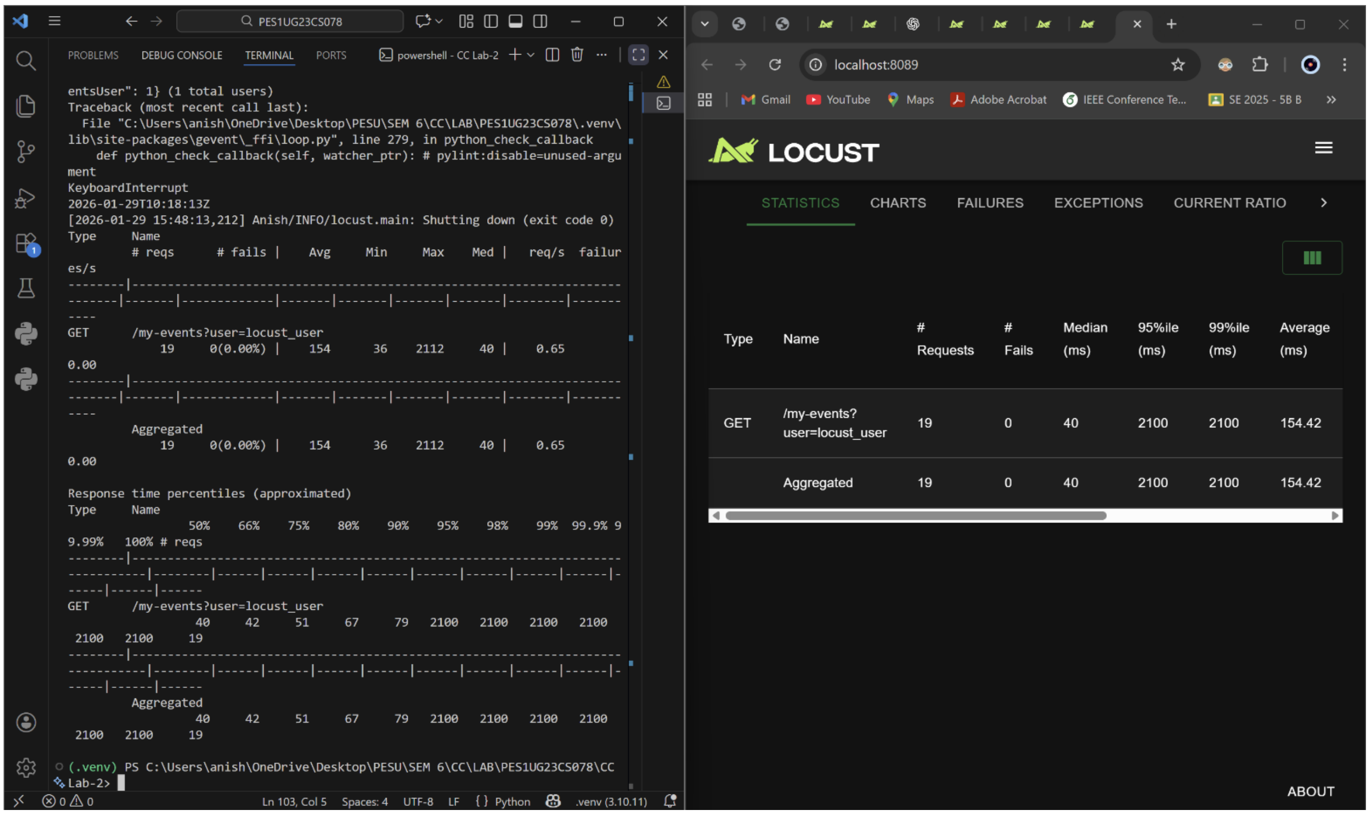
Route 1: /events

What was the bottleneck?
The main issue was inefficient data handling in the /events endpoint. On each request, the system was retrieving and processing the full set of event records, which increased latency as traffic grew.

What change did you make?
The endpoint was refined to avoid unnecessary processing and to make database access more efficient, so only relevant data was fetched and returned.

Why did the performance improve?
Reducing repeated work and improving data retrieval lowered the per-request processing time. That cut response latency and allowed the system to sustain higher load.

SS8 :



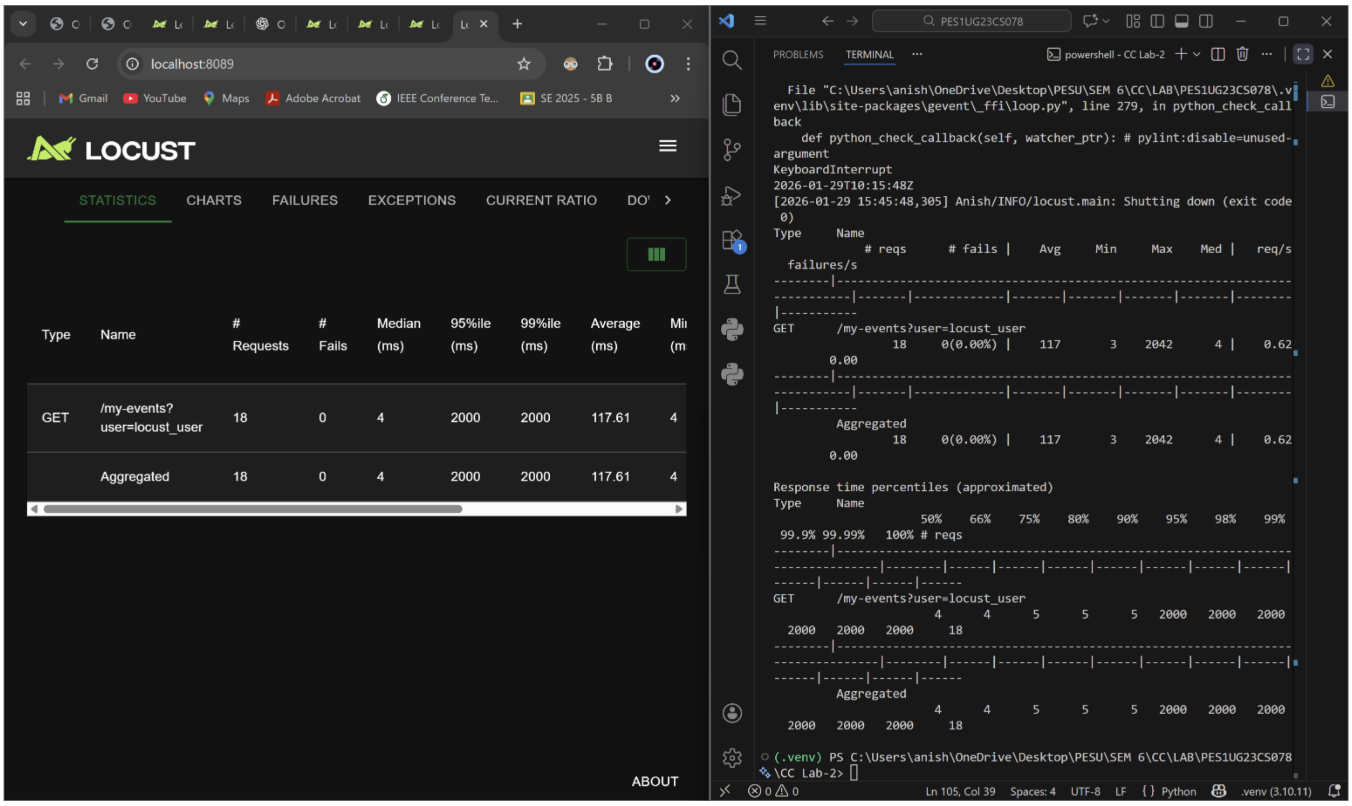
```
entsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\.venv\
lib\site-packages\gevent\_ffi\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argu
ment
KeyboardInterrupt
2026-01-29T10:18:13Z
[2026-01-29 15:48:13,212] Anish/INFO/locust.main: Shutting down (exit code 0)
Type     Name
         # reqs      # fails |    Avg     Min     Max    Med |   req/s  failur
es/s
--------|-----------------------------------------------------------------------
-------|-------|------------|-------|-------|-------|-------|--------|-------
----
GET      /my-events?user=locust_user
             19     0(0.00%) |    154      36    2112     40 |    0.65
0.00
--------|-----------------------------------------------------------------------
-------|-------|------------|-------|-------|-------|-------|--------|-------
----
         Aggregated
             19     0(0.00%) |    154      36    2112     40 |    0.65
0.00

Response time percentiles (approximated)
Type     Name
                 50%    66%    75%    80%    90%    95%    98%    99%  99.9% 9
9.99%   100% # reqs
--------|-----------------------------------------------------------------------
-----------|--------|------|------|------|------|------|------|------|------|-
-----|------|------
GET      /my-events?user=locust_user
                  40     42     51     67     79   2100   2100   2100   2100
 2100   2100     19
--------|-----------------------------------------------------------------------
-----------|--------|------|------|------|------|------|------|------|------|-
-----|------|------
         Aggregated
                  40     42     51     67     79   2100   2100   2100   2100
 2100   2100     19

(.venv) PS C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\CC
Lab-2>
```

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)
GET	/my-events?user=locust_user	19	0	40	2100	2100	154.42
	Aggregated	19	0	40	2100	2100	154.42

SS9 :



Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Average (ms)	Mi (m
GET	/my-events? user=locust_user	18	0	4	2000	2000	117.61	4
	Aggregated	18	0	4	2000	2000	117.61	4

```
  File "C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078\.v
env\lib\site-packages\gevent\_ffi\loop.py", line 279, in python_check_call
back
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-
argument
KeyboardInterrupt
2026-01-29T10:15:48Z
[2026-01-29 15:45:48,305] Anish/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
                 18     0(0.00%) |    117       3    2042      4 |    0.62
        0.00
--------|-----------------------------------------------------------------
----------|-------|------------|-------|-------|-------|-------|--------
|-----------
         Aggregated
                 18     0(0.00%) |    117       3    2042      4 |    0.62
        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
                      4      4      5      5      5   2000   2000   2000
  2000   2000   2000     18
--------|-----------------------------------------------------------------
--------------|-------|------|------|------|------|------|------|------|
------|------|------|------
         Aggregated
                      4      4      5      5      5   2000   2000   2000
  2000   2000   2000     18

(.venv) PS C:\Users\anish\OneDrive\Desktop\PESU\SEM 6\CC\LAB\PES1UG23CS078
\CC Lab-2>
```

Route 2: /my-events

What was the bottleneck?
Performance slowed due to repeated database queries to obtain user-specific events. Under concurrent access, these redundant lookups created noticeable delays.

What change did you make?
The query logic was simplified and structured to prevent repeated fetching of the same user data.

Why did the performance improve?
Fewer and more efficient queries reduced database strain and execution time, leading to faster responses and better handling of simultaneous users.