

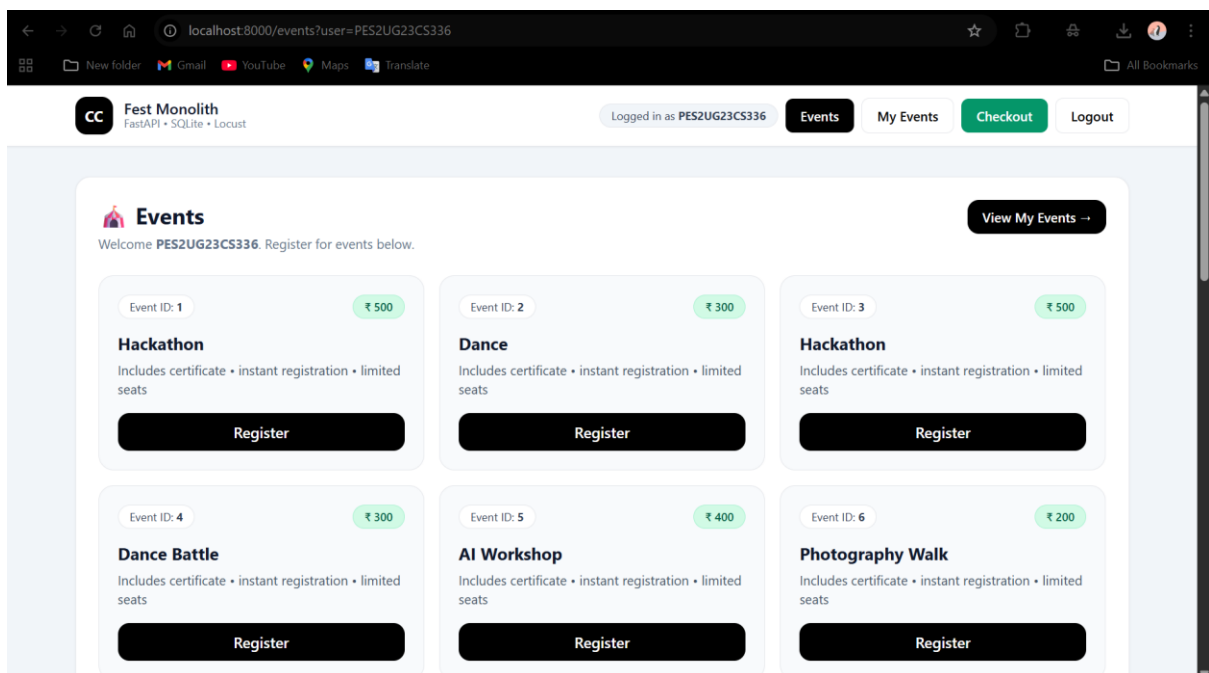
LAB 2- MONOLITHIC ARCHITECTURE

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Section: F

SS1:



SS2:

localhost:8000/checkout

New folderGmailYouTubeMapsTranslate

☆🔖🔒📄🔍

All Bookmarks

CCFest MonolithFastAPI • SQLite • Locust

LoginCreate Account

🌟 **Monolith Failure**

HTTP 500

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

Back to Events

Login

CC Week X • Monolithic Applications Lab

```
total checkout_logic()
File "C:\Users\megha\PES2UG23CS336\CC Lab-2\checkout\__init__.py", line 10, in checkout_logic
1 / 0
ZeroDivisionError: division by zero
```

SS3:

localhost:8000/checkout

New folderGmailYouTubeMapsTranslate

☆🔖🔒📄🔍

All Bookmarks

CCFest MonolithFastAPI • SQLite • Locust

LoginCreate 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).

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```
←[32mINFO←[0m:      127.0.0.1:63784 - "←[1mGET /checkout HTTP/1.1←[0m" ←[32m200 OK←[0m
```

SS4:

The screenshot displays the Locust web interface in a browser. The top navigation bar includes links for New folder, Gmail, YouTube, Maps, and Translate. The main header shows the Locust logo, the host URL (http://localhost:8000), and the status (RUNNING). It also displays metrics for Users (1), RPS (0), and Failures (0%), along with buttons for EDIT, STOP, and RESET. Below the header, a tabbed interface shows STATISTICS, CHARTS, FAILURES, EXCEPTIONS, CURRENT RATIO, DOWNLOAD DATA, and LOGS. The STATISTICS tab is active, showing a table of test results. The table has columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s. The data shows a GET request to /checkout with 2 requests, 0 fails, and a median response time of 10ms. An aggregated row shows the same 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	/checkout	2	0	10	2200	2200	1102.4	10	2195	2797	0	0
	Aggregated	2	0	10	2200	2200	1102.4	10	2195	2797	0	0

```
[C:\Users\megha\PES2UG23CS336\CC Lab-2>.venv\locust -f locust/checkout_locustfile.py
[2026-01-20 14:43:40,009] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:43:40,011] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 14:45:09,303] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:45:09,305] M/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\Lib\site-packages\event\ffi\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
```

KeyboardInterrupt

2026-01-20T09:16:06Z

```
[2026-01-20 14:46:06,526] M/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%)	126	6	2194	10	0.64	0.00
	Aggregated	19	0(0.00%)	126	6	2194	10	0.64	0.00

Response time percentiles (approximated)

[illegible]

LOCUST

Host
http://localhost:8000

Status
RUNNING

Users
1

RPS
0

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	2	0	10	2200	2200	1102.4	10	2195	2797	0	0
	Aggregated	2	0	10	2200	2200	1102.4	10	2195	2797	0	0

ABOUT

```
C:\Users\megha\PES2UG23CS336\CC Lab-2>.venv\Scripts\activate
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/checkout_locustfile.py
[2026-01-20 14:43:40,009] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:43:40,011] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 14:45:09,303] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:45:09,305] M/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\Lib\site-packages\gevent\ffli\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
[2026-01-20 14:46:06,526] M/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%)      126      6      2194      10      0.64      0.00
-----
Aggregated      19      0(0.00%)      126      6      2194      10      0.64      0.00
-----

Response time percentiles (approximated)
Type      Name      50%      66%      75%      80%      90%      95%      98%
-----
GET      /checkout      2200      2200      2200      2200      2200      2200      2200
-----
Aggregated      2200      2200      2200      2200      2200      2200      2200
-----
```

SS4:

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	/checkout	20	0	8	2000	2000	111.61	7	2048	2797	0.7	0
	Aggregated	20	0	8	2000	2000	111.61	7	2048	2797	0.7	0

ABOUT

```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/checkout_locustfile.py
[2026-01-20 14:56:33,297] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 14:56:33,298] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 14:57:26,492] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 14:57:26,497] M/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\Lib\site-packages\gevent\ffli\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
[2026-01-20 14:59:21,017] M/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%)      111      7      2048      8      0.69      0.00
-----
Aggregated      20      0(0.00%)      111      7      2048      8      0.69      0.00
-----

Response time percentiles (approximated)
Type      Name      50%      66%      75%      80%      90%      95%      98%      99%      99.9%      99.99%      100% # r
-----
GET      /checkout      8      10      11      16      19      2000      2000      2000      2000      2000      2000
-----
Aggregated      8      10      11      16      19      2000      2000      2000      2000      2000      2000
-----

(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>
```

The screenshot displays the Locust web interface at localhost:8089. The top navigation bar includes links for Statistics, Charts, Failures, Exceptions, and Current. The main content area shows a table of statistics for GET requests to /checkout.

Type	Name	# Requests	# Fails	Median (ms)	95%ile (ms)	99%ile (ms)	Ave (ms)
GET	/checkout	20	0	8	2000	2000	111
	Aggregated	20	0	8	2000	2000	111

The terminal window on the right shows the command used to start Locust:

```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/checkout_locustfile.py
```

The terminal output indicates that Locust version 2.43.1 is running, starting the web interface at http://localhost:8089, and ramping up 1 user at a rate of 1.00 per second. It also shows the status of all users spawned and the current call stack.

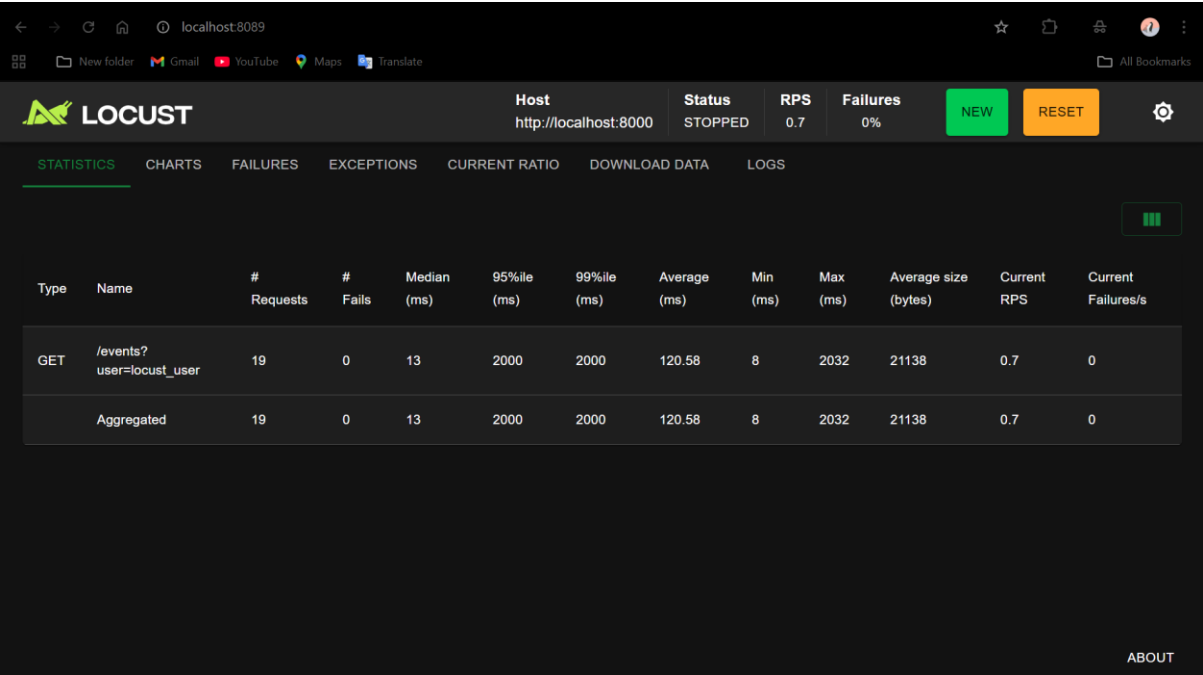
The screenshot shows the Locust web interface with the following details:

- Top Bar:** Locust logo, Host: http://localhost:8000, Status: STOPPED, RPS: 0.5, Failures: 0%. Buttons for NEW, RESET, and a settings icon are present.
- Navigation:** STATISTICS (active), CHARTS, FAILURES, EXCEPTIONS, CURRENT RATIO, DOWNLOAD DATA, LOGS.
- Table:**

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	15	0	480	2500	2500	640.18	365	2548	21138	0.5	0
	Aggregated	15	0	480	2500	2500	640.18	365	2548	21138	0.5	0

ABOUT

SS7:



```
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/events_locustfile.py
[2026-01-20 15:42:34,441] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:42:34,442] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:42:49,777] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:42:49,780] M/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\Lib\site-packages\gevent\_ffi\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-20T10:15:51Z
[2026-01-20 15:45:51,380] M/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%) | 120   7  2032  13 | 0.66   0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated                                     19      0(0.00%) | 120   7  2032  13 | 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       /events?user=locust_user                  13     19     19     23     36    2000    2000    2000    2000    2000    2000    19
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated                                     13     19     19     23     36    2000    2000    2000    2000    2000    2000    19

(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>
```

SS8:

The screenshot shows the Locust web interface at localhost:8089. The top bar displays the Locust logo, host URL (http://localhost:8000), status (STOPPED), RPS (0.6), and failures (0%). There are 'NEW' and 'RESET' buttons. Below the top bar is a navigation menu with 'STATISTICS' selected. The main content area shows a table of statistics for a GET request to /my-events?user=locust_user. The table has columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s. The data shows 18 requests, 0 fails, and a median response time of 150ms. An 'Aggregated' row shows the same statistics. A green 'STOP' button is visible in the top right corner of the main area.

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	18	0	150	2200	2200	272.37	122	2177	3144	0.6	0
Aggregated		18	0	150	2200	2200	272.37	122	2177	3144	0.6	0

SS9:

The screenshot shows the Locust web interface at localhost:8089. The top bar displays the Locust logo, host URL (http://localhost:8000), status (STOPPED), RPS (0.7), and failures (0%). There are 'NEW' and 'RESET' buttons. Below the top bar is a navigation menu with 'STATISTICS' selected. The main content area shows a table of statistics for a GET request to /my-events?user=locust_user. The table has columns for Type, Name, # Requests, # Fails, Median (ms), 95%ile (ms), 99%ile (ms), Average (ms), Min (ms), Max (ms), Average size (bytes), Current RPS, and Current Failures/s. The data shows 19 requests, 0 fails, and a median response time of 19ms. An 'Aggregated' row shows the same statistics. A green 'STOP' button is visible in the top right corner of the main area.

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	19	2100	2100	126.55	7	2094	3144	0.7	0
Aggregated		19	0	19	2100	2100	126.55	7	2094	3144	0.7	0

```

(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>
(.venv) C:\Users\megha\PES2UG23CS336\CC Lab-2>locust -f locust/myevents_locustfile.py
[2026-01-20 15:49:21,707] M/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:49:21,708] M/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:49:58,690] M/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:49:58,712] M/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\megha\PES2UG23CS336\CC Lab-2\.venv\Lib\site-packages\gevent\ffi\loop.py", line 279, in python_check_callback
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument
KeyboardInterrupt
2026-01-20T10:22:22Z
[2026-01-20 15:52:22,421] M/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%) | 126       7      2093     19 | 0.64    0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated                                     19          0(0.00%) | 126       7      2093     19 | 0.64    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                19       21       23       25       35     2100     2100     2100     2100     2100     2100  19
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated                                     19       21       23       25       35     2100     2100     2100     2100     2100     2100  19
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|

```

Explanations of Optimizations:

1. Route /events

Bottleneck:

The route contained unnecessary CPU intensive computation that delayed each request.

Change made:

Removed redundant looping logic that did not contribute to the response i.e removing the waste loop

Why performance improved:

Eliminating unnecessary processing reduced execution time and improved response latency.

2. Route /my-events

Bottleneck:

Artificial delay was introduced through redundant looping, increasing request processing time.

Change made:

Removed the unnecessary loop while keeping database logic unchanged.

Why performance improved:

Reducing CPU usage per request lowered response time and improved throughput under load.

