

6th Semester, Academic Year 2025-26

Date: 20/1/26

| | | |
|---------------------------|--------------------|-----------|
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|---------------------------|--------------------|-----------|

CLOUD COMPUTING _LAB 2

SS_1 :-



Events

Welcome PES2UG23CS366. Register for events below.

[View My Events →](#)

| | | |
|--|--|---|
| <p>Event ID: 1 ₹ 500</p> <p>Hackathon Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 2 ₹ 300</p> <p>Dance Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 3 ₹ 500</p> <p>Hackathon Includes certificate • instant registration • limited seats</p> <p>Register</p> |
| <p>Event ID: 4 ₹ 300</p> <p>Dance Battle Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 5 ₹ 400</p> <p>AI Workshop Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 6 ₹ 200</p> <p>Photography Walk Includes certificate • instant registration • limited seats</p> <p>Register</p> |
| <p>Event ID: 7 ₹ 350</p> <p>Gaming Tournament Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 8 ₹ 250</p> <p>Music Night Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 9 ₹ 150</p> <p>Treasure Hunt Includes certificate • instant registration • limited seats</p> <p>Register</p> |

| | | |
|---|---|--|
| <p>Event ID: 10</p> <p>Stand-up Comedy</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 11</p> <p>Robo Race</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 12</p> <p>Hackathon</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> |
| <p>Event ID: 13</p> <p>Dance Battle</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 14</p> <p>AI Workshop</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 15</p> <p>Photography Walk</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> |
| <p>Event ID: 16</p> <p>Gaming Tournament</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 17</p> <p>Music Night</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> | <p>Event ID: 18</p> <p>Treasure Hunt</p> <p>Includes certificate • instant registration • limited seats</p> <p>Register</p> |
| <p>Event ID: 19</p> <p>Stand-up Comedy</p> <p>Includes certificate • instant registration • limited seats</p> | <p>Event ID: 20</p> <p>Robo Race</p> <p>Includes certificate • instant registration • limited seats</p> | |

SS_2 :-

The screenshot shows a web page with the following details:

- Fest Monolith** logo and text: FastAPI + SQLite + Locust
- 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
- HTTP 500** status code indicator
- Buttons:** Back to Events, Login
- CC Week X - Monolithic Applications Lab

SS-3 :

localhost:8000/checkout

Fest Monolith
FastAPI • SQLite • Locust

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

SS-4 (before optimization)

```
(.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2\CC Lab-2> locust -f locust/checkout_locustfile.py
>>
[2026-01-20 15:15:19,512] DESKTOP-CNT4U74/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:15:19,513] DESKTOP-CNT4U74/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:15:40,582] DESKTOP-CNT4U74/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:15:40,586] DESKTOP-CNT4U74/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_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
2026-01-20T09:46:02Z
[2026-01-20 15:16:02,483] DESKTOP-CNT4U74/INFO/locust.main: Shutting down (exit code 0)
Type      Name           # reqs     # fails |   Avg    Min    Max   Med | req/s failures/s
-----+-----+-----|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Type      Name           50%      66%    75%   80%   90%   95%   98%   99%  99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout        10       11     12     12     13    2100   2100   2100   2100   2100   2100   13
Type      Name           50%      66%    75%   80%   90%   95%   98%   99%  99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout        10       11     12     12     13    2100   2100   2100   2100   2100   2100   13
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                      10       11     12     12     13    2100   2100   2100   2100   2100   2100   13

(.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2\CC Lab-2>
```

localhost:8089

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 | Current Failures/s |
|------------|-----------|------------|---------|-------------|-------------|-------------|--------------|----------|----------|----------------------|-------------|--------------------|
| GET | /checkout | 13 | 0 | 10 | 2100 | 2100 | 169.79 | 8 | 2081 | 2797 | 0.6 | 0 |
| Aggregated | | 13 | 0 | 10 | 2100 | 2100 | 169.79 | 8 | 2081 | 2797 | 0.6 | 0 |

SS- 5 : (after the change)

localhost:8089

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 | 18 | 0 | 11 | 2300 | 2300 | 137.77 | 8 | 2293 | 2797 | 0.7 | 0 |
| Aggregated | | 18 | 0 | 11 | 2300 | 2300 | 137.77 | 8 | 2293 | 2797 | 0.7 | 0 |

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
(.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2\CC Lab-2> locust -f locust/checkout_locustfile.py
>>
    def python_check_callback(self, watcher_ptr): # pylint:disable=unused-argument

KeyboardInterrupt
2026-01-20T09:41:51Z
[2026-01-20 15:11:51,801] DESKTOP-CNT4U74/INFO/locust.main: Shutting down (exit code 0)
Type      Name          # reqs   # fails | Avg     Min     Max     Med | req/s failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET      /checkout      18      0(0.00%) | 137      7     2293    11 | 0.63      0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated          18      0(0.00%) | 137      7     2293    11 | 0.63      0.00

Response time percentiles (approximated)
Type      Name          50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99
% 100% # reqs
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|
GET      /checkout      11      11     12     13     14     2300    2300    2300    2300    230
0 2300 18
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|
Aggregated          11      11     12     13     14     2300    2300    2300    2300    230
0 2300 18

○ (.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2\CC Lab-2>

```

SS-6 :

(before optimization)

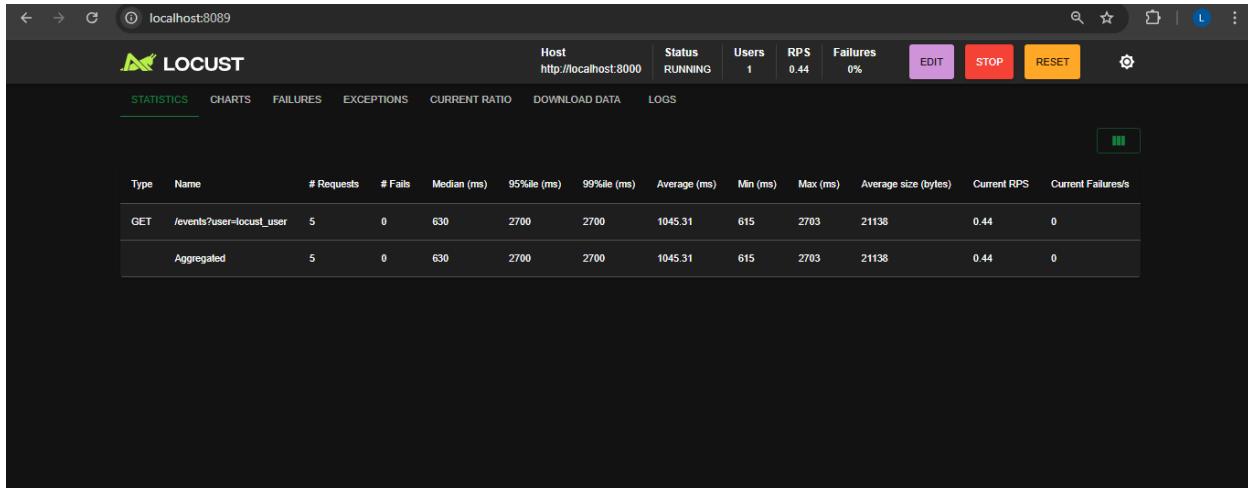
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
(.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2\CC Lab-2> locust -f locust/events_locustfile.py
>>
KeyboardInterrupt
2026-01-20T09:50:14Z
[2026-01-20 15:20:14,390] DESKTOP-CNT4U74/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      6      0(0.00%) | 916     272     2702    620 | 0.47      0.00
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated          6      0(0.00%) | 916     272     2702    620 | 0.47      0.00
Aggregated          6      0(0.00%) | 916     272     2702    620 | 0.47      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      630    630    660    660    2700    2700    2700    2700    2700 270
0 2700 6
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
-----|-----|
Aggregated          630    630    660    660    2700    2700    2700    2700    2700 270
0 2700 6

○ (.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2\CC Lab-2>

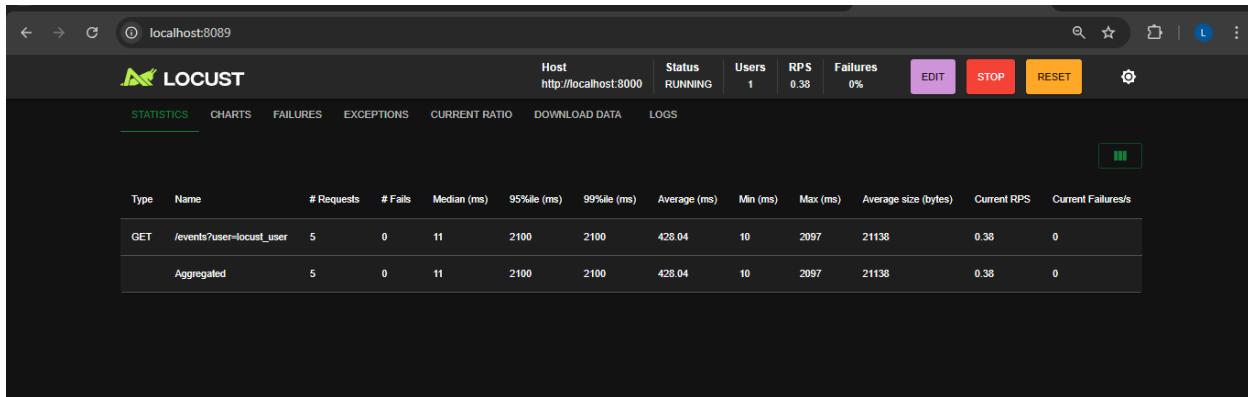
```



SS7 : (after optimization)

```
(.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2> locust -f locust/events_locustfile.py
>>
[2026-01-20 15:24:38,493] DESKTOP-CNT4U74/INFO/locust.main: Starting Locust 2.43.1
[2026-01-20 15:24:38,493] DESKTOP-CNT4U74/INFO/locust.main: Starting web interface at http://localhost:8089, press enter to open your default browser.
[2026-01-20 15:24:50,527] DESKTOP-CNT4U74/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:24:50,531] DESKTOP-CNT4U74/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_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

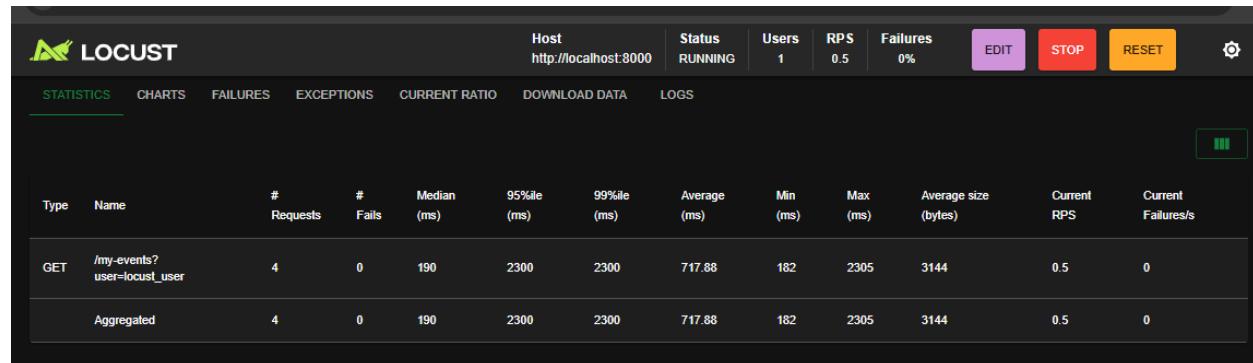
KeyboardInterrupt
2026-01-20T09:55:01Z
[2026-01-20 15:25:01,858] DESKTOP-CNT4U74/INFO/locust.main: Shutting down (exit code 0)
Type      Name          # reqs   # fails | Avg     Min     Max     Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /events?user=locust_user      5       0(0.00%) | 428     10     2096    11 | 0.52     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
          11   11   11   2100  2100  2100  2100  2100  2100  2100  2100  2100
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
          Aggregated           11   11   11   2100  2100  2100  2100  2100  2100  2100  2100  2100
0   2100      5
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```



SS8 (before optimization):

```
(.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2> locust -f locust/myevents_locustfile.py
>>
fault browser.
[2026-01-20 15:29:53,653] DESKTOP-CNT4U74/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:29:53,655] DESKTOP-CNT4U74/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_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
2026-01-20T10:00:04Z
[2026-01-20 15:30:04,224] DESKTOP-CNT4U74/INFO/locust.main: Shutting down (exit code 0)
Type      Name          # reqs   # fails | Avg     Min     Max     Med | req/s failures/
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /my-events?user=locust_user        6       0(0.00%) | 521     90     2305   180 | 0.58     0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                         6       0(0.00%) | 521     90     2305   180 | 0.58     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        190    190    190    190    2300   2300   2300   2300   2300  2300
0 2300  6
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-|-----|
Aggregated                         190    190    190    190    2300   2300   2300   2300   2300  2300
0 2300  6
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
○ (.venv) PS C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_CC_Lab-2>
```

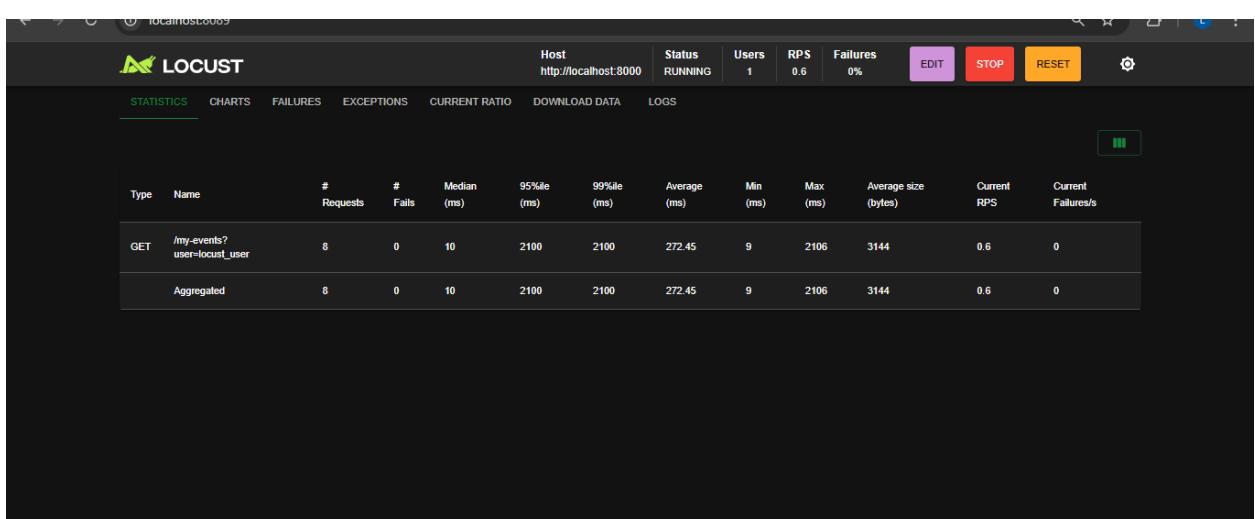


SS9 (after change) :

```
fault browser.
[2026-01-20 15:31:50,824] DESKTOP-CNT4U74/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-20 15:31:50,827] DESKTOP-CNT4U74/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
Traceback (most recent call last):
  File "C:\Users\Sathvik Srivathsav\Downloads\PES2UG23CS366_Monolith_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
2026-01-20T10:02:06Z
[2026-01-20 15:32:06,832] DESKTOP-CNT4U74/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          9   0(0.00%) | 243   8  2106  10 | 0.59   0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
                           Aggregated          9   0(0.00%) | 243   8  2106  10 | 0.59   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          10   11   11   11  2100  2100  2100  2100  2100  2100
0  2100  9
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
-|-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
                           Aggregated          10   11   11   11  2100  2100  2100  2100  2100  2100
0  2100  9
```



Optimizations :-

Route: /events

- Bottleneck: Repeated processing of event data on every request.
 - Change : Optimised the logic to iterate once and remove unnecessary computations.
 - performance after change : Reduced CPU operations led to faster response times.

Route: /my-events

- Bottleneck: Inefficient filtering of user-specific events.
 - Change : Simplified filtering logic to avoid redundant iterations.

- performance after change : Lower processing overhead improved average response time.

Route: /checkout : -

- Bottleneck:
The checkout route contained inefficient logic where the total fee was calculated using a loop that decremented the fee value step by step, resulting in unnecessary iterations and increased computation time.
- Change :
The inefficient loop-based calculation was replaced with a direct and optimised summation approach that computes the total fee in a single pass.
- performance after change:
By eliminating unnecessary looping and reducing the number of operations, the response time of the checkout route decreased, leading to improved performance under load.