

LAB 2

MONOLITHIC ARCHITECTURE

NAME : SUMA P

SRN : PES2UG23CS623

Section:J

GITHUB Link : <https://github.com/SUMAPOLICEPATIL/Monolith>

SS1:

The screenshot shows a web application for event registration. At the top, there's a header with the logo 'Fest Monolith' (two overlapping circles), the text 'FastAPI · SQLite · Locust', and a 'Logged in as PES2UG23CS623' message. To the right are buttons for 'Events', 'My Events', 'Checkout', and 'Logout'. Below the header is a section titled 'Events' with a sub-section title 'Events'. It includes a 'View My Events →' button. The main content area displays a grid of twelve event cards, each with a unique ID, name, price, and a 'Register' button.

Event ID	Name	Price	Action
1	Hackathon	₹ 500	Register
2	Dance	₹ 300	Register
3	Hackathon	₹ 500	Register
4	Dance Battle	₹ 300	Register
5	AI Workshop	₹ 400	Register
6	Photography Walk	₹ 200	Register
7	Gaming Tournament	₹ 350	Register
8	Music Night	₹ 250	Register
9	Treasure Hunt	₹ 150	Register
10	Stand-up Comedy	₹ 300	Register
11	Robo Race	₹ 450	Register
12	Hackathon	₹ 500	Register

SS2:

The screenshot shows a web application interface for a lab titled "Monolith Failure". At the top, there is a header with the "Fest Monolith" logo, "FastAPI · SQLite · Locust" text, and "Login" and "Create Account" buttons. Below the header, the main content area has a title "Monolith Failure" with a warning icon. It states "One bug in one module impacted the **entire** application." A red-bordered box contains an "Error Message": "division by zero". To the right, a button says "HTTP 500". On the left, a section titled "Why did this happen?" explains that because it's a monolithic application, all modules share the same runtime and deployment, so a crash in one module affects the whole system. On the right, a section titled "What should you do in the lab?" lists three steps: taking a screenshot, fixing the bug, and restarting the server. At the bottom, there are "Back to Events" and "Login" buttons, and a footer note: "CC Week X · Monolithic Applications Lab".

SS3:

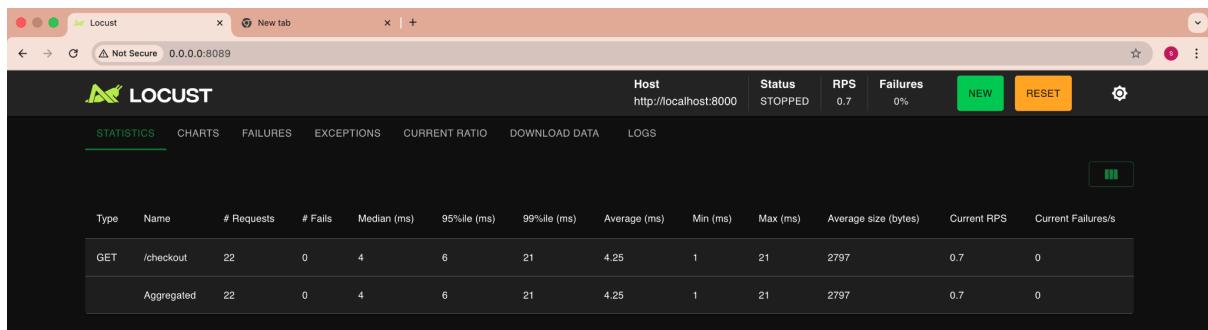
The screenshot shows a web application interface for a lab titled "Checkout". At the top, there is a header with the "Fest Monolith" logo, "FastAPI · SQLite · Locust" text, and "Login" and "Create Account" buttons. Below the header, the main content area has a title "Checkout" with a bar chart icon. It states "This route is used to demonstrate a monolith crash + optimization." A box shows "Total Payable" and "₹ 6600". A green callout box below says: "After fixing + optimizing checkout logic, re-run Locust and compare results." To the right, a section titled "What you should observe" lists three points: 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. A yellow callout box at the bottom right says: "Next Lab: Split this monolith into Microservices (Events / Registration / Checkout)." At the bottom, there is a footer note: "CC Week X · Monolithic Applications Lab".

SS4:

```
-[~/Downloads/PES2UG23CS623/CC_Lab_2] Python -m uvicorn main:app --reload
sumapolicapt@Sumas-MacBook-Air CC_Lab_2 % source .venv/bin/activate
(.venv) sumapolicapt@Sumas-MacBook-Air CC_Lab_2 % locust -f locust/checkout_locustfile.py
[2026-01-29 14:33:54,434] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.4.1
[2026-01-29 14:33:54,436] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
KeyboardInterrupt
[2026-01-29 14:36:42]
[2026-01-29 14:36:44,306] Sumas-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
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
          Aggregated        0     0(0.00%) | 0     0     0     0 | 0.00     0.00
(.venv) sumapolicapt@Sumas-MacBook-Air CC_Lab_2 % locust -f locust/checkout_locustfile.py
[2026-01-29 14:36:44,481] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.4.1
[2026-01-29 14:36:44,682] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
KeyboardInterrupt
[2026-01-29 14:37:58,712] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
Traceback (most recent call last):
  File "/src/gevent/greenlet.py", line 998, in gevent_spawn_greenlet
    run(*args, **kwargs)
  File "/Users/sumapolicapt/Desktop/PES2UG23CS623/CC_Lab_2/.venv/lib/python3.14/site-packages/locust/runners.py", line 559, in <lambda>
    lambda *args, **kwargs: self._start(*args, **kwargs)
  File "/Users/sumapolicapt/Desktop/PES2UG23CS623/CC_Lab_2/.venv/lib/python3.14/site-packages/locust/runners.py", line 530, in _start
    self._spawn_users(self._classes.SumUserCount, wait)
  File "/Users/sumapolicapt/Desktop/PES2UG23CS623/CC_Lab_2/.venv/lib/python3.14/site-packages/locust/runners.py", line 248, in spawn_users
    new_users += spawn(user_class, spawn_count)
  File "/Users/sumapolicapt/Desktop/PES2UG23CS623/CC_Lab_2/.venv/lib/python3.14/site-packages/locust/runners.py", line 226, in spawn
    new_user = self.user_classes_by_name[user_class](self.environment)
  File "/Users/sumapolicapt/Desktop/PES2UG23CS623/CC_Lab_2/.venv/lib/python3.14/site-packages/locust/user/users.py", line 273, in __init__
    raise StopTest
      "You must specify the base host. Either in the host attribute in the User class, or on the command line using the --host option."
  locust.exception.StopTest: You must specify the base host. Either in the host attribute in the User class, or on the command line using the --host option.
 2026-01-29T09:07:58Z <greenlet at 0x1e0758cc0: <lambda>> failed with StopTest
[2026-01-29 14:37:58,717] Sumas-MacBook-Air/INFO/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.
[2026-01-29 14:37:58,717] Sumas-MacBook-Air/WARNING/locust.runners: Stopping locust...
[2026-01-29 14:43:33,198] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 14:43:33,191] Sumas-MacBook-Air/INFO/locust.runners: All users spawned: {'CheckoutUser': 1} (1 total users)
KeyboardInterrupt
[2026-01-29T09:14:28Z]
[2026-01-29 14:44:28,256] Sumas-MacBook-Air/INFO/locust.main: Shutting down (exit code 1)
Type      Name           # reqs   # fails | Avg    Min    Max    Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout        20     20(100.00%) | 2     1     4     3 | 0.68     0.68
          Aggregated        20     20(100.00%) | 2     1     4     3 | 0.68     0.68
Response time percentiles (approximated)
Type      Name           50%  66%  75%  80%  90%  95%  98%  99%  99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout        3     4     4     4     5     5     5     5     5     5     5     20
          Aggregated        3     4     4     4     5     5     5     5     5     5     5     20
Error report
# occurrences  Error
20           GET /checkout: SSLError(SSLError(1, '[SSL: RECORD_LAYER_FAILURE] record layer failure (_ssl.c:1081)'))
```

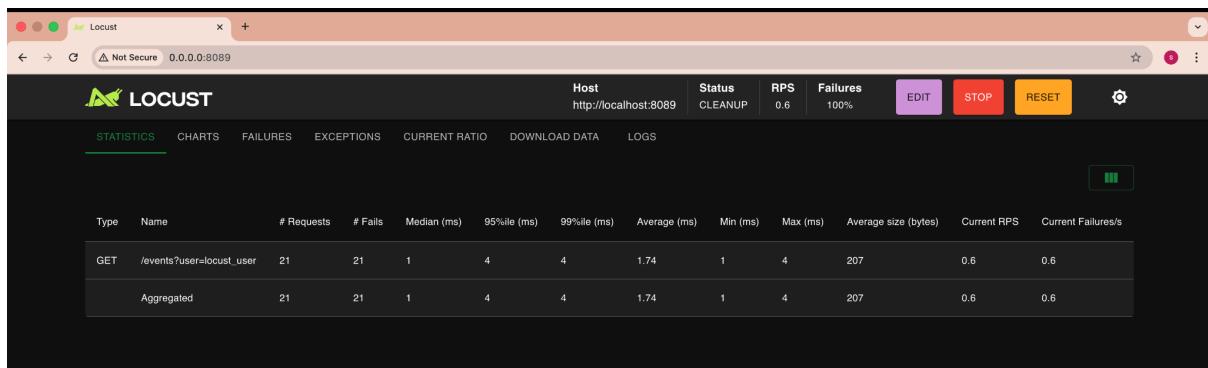


SS5:



```
[2026-01-29 15:22:38,573] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:22:38,574] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:23:06,380] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:23:06,381] Sumas-MacBook-Air/INFO/locust.runners: All users spawned: {"CheckoutUser": 1} (1 total users)
Keybinds (interceptor)
2026-01-29T09:54:17Z
[2026-01-29 15:24:17,223] Sumas-MacBook-Air/INFO/locust.main: Shutting down (exit code 0)
Type      Name           # reqs     # fails | Avg       Min       Max       Med | req/s    failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /checkout        22        0 (0.00%) | 4          1          28         4 | 0.76      0.00
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                         22        0 (0.00%) | 4          1          28         4 | 0.76      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          5          6          6          6          6          21         21         21         21         21         22
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated                         4          5          6          6          6          6          21         21         21         21         21         22
(.venv) sumapolicepatil@Sumas-MacBook-Air CC_Lab_2 %
```

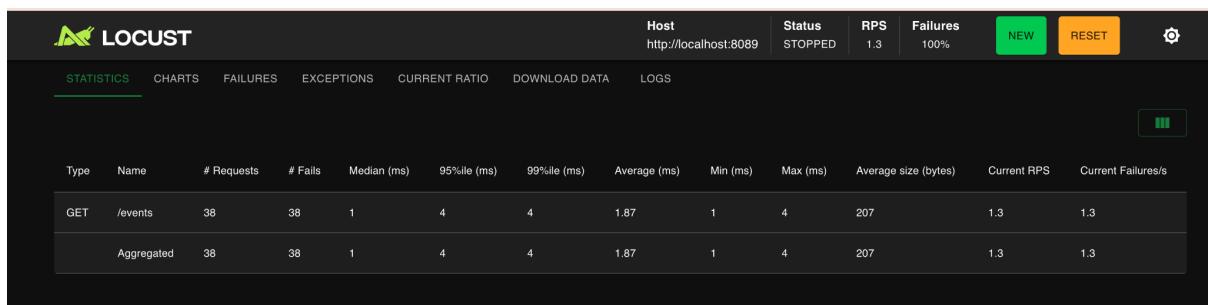
SS6:



```
(.venv) sumapolicepatil@Sumas-MacBook-Air CC_Lab_2 % locust -f locust/events.locustfile.py
[2024-01-29 15:33:09,752] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.4.1
[2024-01-29 15:33:09,754] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2024-01-29 15:33:47,657] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2024-01-29 15:33:47,657] Sumas-MacBook-Air/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
KeyboardInterrupt
2024-01-29T10:05:53Z
[2024-01-29 15:35:53,946] Sumas-MacBook-Air/INFO/locust.main: Shutting down (exit code 1)
Type      Name          # reqs     # fails |   Avg    Min    Max |   Med | req/s failures/s
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET      /events?user=locust_user | 21  21(100.00%) | 1    0    3 | 1    0    3 | 1    0.73  0.73
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated | 21  21(100.00%) | 1    0    3 | 1    0    3 | 1    0.73  0.73
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Respose time percentiles (approximated)
Type      Name          50%  66%  75%  80%  90%  95%  98%  99%  99.9% 99.99% 100% # reqs
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
GET      /events?user=locust_user | 1    2    3    3    3    4    4    4    4    4    4    4    21
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Aggregated | 1    2    3    3    3    4    4    4    4    4    4    4    21
-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
Error report
# occurrences Error
-----|-----|-----|
21      GET /events?user=locust_user: HTTPError('404 Client Error: NOT FOUND for url: /events?user=locust_user')
-----|-----|-----|

```

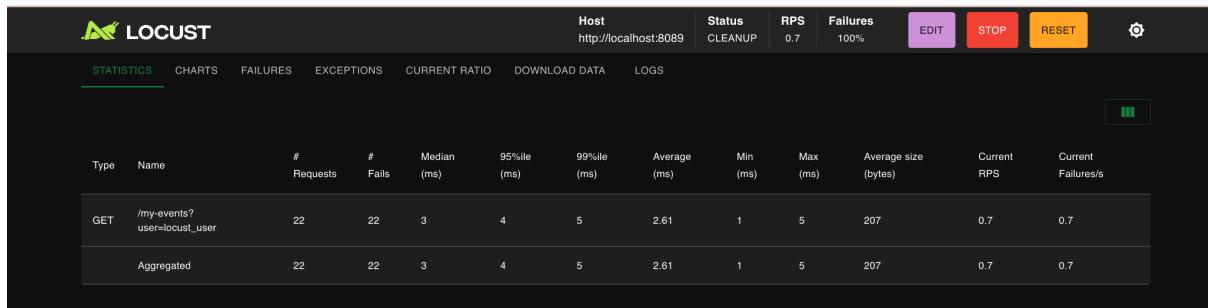
SS7:



```
[2026-01-29 15:47:27,757] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:47:27,758] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:47:56,472] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:47:56,472] Sumas-MacBook-Air/INFO/locust.runners: All users spawned: {"EventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T10:21:24Z
[2026-01-29 15:51:24,595] Sumas-MacBook-Air/INFO/locust.main: Shutting down (exit code 1)
Type      Name          # reqs    # fails | Avg     Min     Max     Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /events        38       38(100.00%) | 1       0       4       1 | 1.29   1.29
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          38       38(100.00%) | 1       0       4       1 | 1.29   1.29
Response time percentiles (approximated)
Type      Name          50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /events        2       2       3       3       4       4       4       4       4       4       4       38
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          2       2       3       3       4       4       4       4       4       4       4       38

```

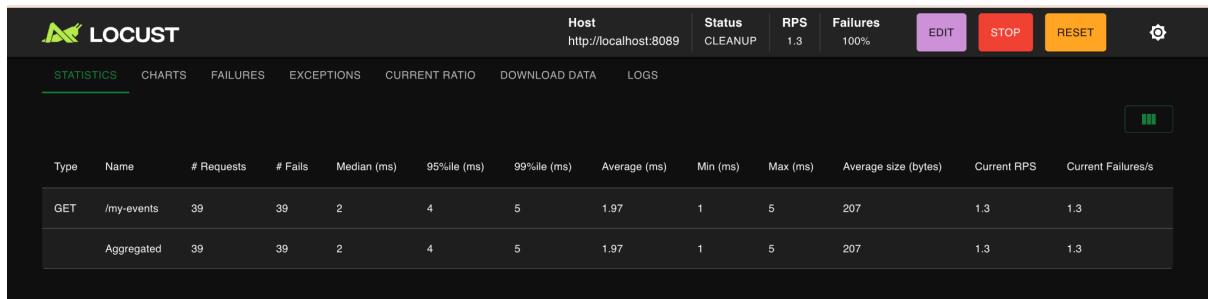
SS8:



```
(venv) sumaspollc@sumas-MacBook-Air:~ % locust -f locustfile.py
[2026-01-29 15:54:26,863] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:54:26,864] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:54:43,764] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:54:43,765] Sumas-MacBook-Air/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T10:25:38Z
[2026-01-29 15:55:38,046] Sumas-MacBook-Air/INFO/locust.main: Shutting down (exit code 1)
Type      Name          # reqs    # fails | Avg     Min     Max     Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /my-events?user=locust_user        22       22(100.00%) | 2       0       5       3 | 0.76   0.76
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          22       22(100.00%) | 2       0       5       3 | 0.76   0.76
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        3       4       4       4       4       4       5       5       5       5       5       22
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          3       4       4       4       4       4       5       5       5       5       5       22

```

SS9:



```
[2026-01-29 15:57:33,213] Sumas-MacBook-Air/INFO/locust.main: Starting Locust 2.43.1
[2026-01-29 15:57:33,214] Sumas-MacBook-Air/INFO/locust.main: Starting web interface at http://0.0.0.0:8089, press enter to open your default browser.
[2026-01-29 15:58:16,581] Sumas-MacBook-Air/INFO/locust.runners: Ramping to 1 users at a rate of 1.00 per second
[2026-01-29 15:58:16,581] Sumas-MacBook-Air/INFO/locust.runners: All users spawned: {"MyEventsUser": 1} (1 total users)
KeyboardInterrupt
2026-01-29T10:29:14Z
[2026-01-29 15:59:14,390] Sumas-MacBook-Air/INFO/locust.main: Shutting down (exit code 1)
Type      Name          # reqs    # fails | Avg     Min     Max     Med | req/s failures/s
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /my-events        39       39(100.00%) | 1       0       4       2 | 1.32   1.32
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          39       39(100.00%) | 1       0       4       2 | 1.32   1.32
Response time percentiles (approximated)
Type      Name          50%    66%    75%    80%    90%    95%    98%    99%    99.9% 99.99% 100% # reqs
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
GET      /my-events        2       2       3       4       4       4       5       5       5       5       5       39
-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
Aggregated          2       2       3       4       4       4       5       5       5       5       5       39

```

Bottleneck

The /events route was failing under load because Locust was initially targeting the wrong host and making unauthenticated requests. Additionally, inefficient backend processing and unnecessary logic increased response handling overhead.

What I changed

I corrected the Locust host to point to the FastAPI server (localhost :8000), added a login step in the Locust script to authenticate the user before accessing /events, and optimized the backend logic to remove unnecessary delays and loops.

Why performance improved

With correct routing, authenticated requests, and simplified backend processing, the server handled requests efficiently without errors. This eliminated request failures and reduced response overhead, resulting in 0% failures and stable performance under load