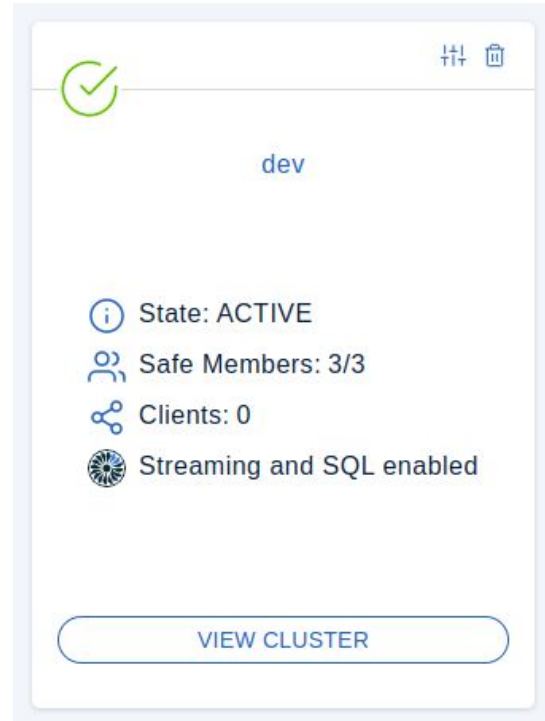


https://github.com/karyna-volokhatiuk/APZ_labs/tree/hazelcast

Пункт 3

```
karyna@karyna: ~  
[main] [c.h.j.t.JobCoordinationService]: [172.17.0.2]:5701 [dev] [5.2.2] Jet started scanning for jobs  
2023-03-20 16:37:04,266 [INFO] [main] [c.h.c.LifecycleService]: [172.17.0.2]:5701 [dev] [5.2.2] [172.17.0.2]:5701 is STARTED  
2023-03-20 16:37:27,407 [INFO] [hz.quirky_maxwell.priority-generic-operation.thread-0] [c.h.c.i.p.t.AuthenticationMessageTask]: [172.17.0.2]:5701 [dev] [5.2.2] Received auth from Connection[id=4, /172.17.0.2:5701->/172.17.0.5:52453, qualifier=null, endpoint=[172.17.0.5]:52453, remoteUuid=cef99e7a-491f-4dc6-b8b6-09d30237c4f5, alive=true, connectionType=MCJVM, planeIndex=-1], successfully authenticated, clientUuid: cef99e7a-491f-4dc6-b8b6-09d30237c4f5, client name: MC-Client-dev, client version: 5.2.1  
karyna@karyna: ~ 33x27  
a36cc  
2023-03-20 16:37:04,340 [INFO] [hz.vigorous_herschel.priority-generic-operation.thread-0] [c.h.c.i.p.t.PartitionStateManager]: [172.17.0.3]:5701 [dev] [5.2.2] Initializing cluster partition table arrangement...  
2023-03-20 16:37:28,383 [INFO] [hz.vigorous_herschel.priority-generic-operation.thread-0] [c.h.c.i.p.t.AuthenticationMessageTask]: [172.17.0.3]:5701 [dev] [5.2.2] Received auth from Connection[id=3, /172.17.0.3:5701->/172.17.0.5:34489, qualifier=null, endpoint=[172.17.0.5]:34489, remoteUuid=cef99e7a-491f-4dc6-b8b6-09d30237c4f5, alive=true, connectionType=MCJVM, planeIndex=-1], successfully authenticated, clientUuid: cef99e7a-491f-4dc6-b8b6-09d30237c4f5, client name: MC-Client-dev, client version: 5.2.1  
karyna@karyna: ~ 101x27  
2023-03-20 16:36:58,596 [INFO] [main] [c.h.w.MCApplication]: Starting MCApplication v5.2.1 using Java 17.0.6 on c9f3f6d4f8f8 with PID 1 (/opt/hazelcast/management-center/hazelcast-management-center-5.2.1.jar started by hazelcast in /opt/hazelcast/management-center)  
2023-03-20 16:36:58,612 [INFO] [main] [c.h.w.MCApplication]: No active profile set, falling back to 1 default profile: "default"  
2023-03-20 16:37:01,194 [INFO] [main] [c.h.w.c.SqlDbConfig]: Checking DB for required migrations.  
2023-03-20 16:37:02,410 [INFO] [main] [c.h.w.c.SqlDbConfig]: Number of applied DB migrations: 19.  
2023-03-20 16:37:03,375 [INFO] [main] [c.h.w.s.s.i.DisableLoginStrategy]: Login will be disabled for 5 seconds after 3 failed login attempts. For every 3 consecutive failed login attempts, disable period will be multiplied by 10.  
2023-03-20 16:37:06,388 [INFO] [main] [c.h.w.MCApplication]: Started MCApplication in 8.99 seconds (JVM running for 10.89)  
2023-03-20 16:37:06,420 [INFO] [AsyncExecutor-2] [c.h.w.MCApplication]: Hazelcast Management Center successfully started at http://localhost:8080  
2023-03-20 16:37:06,423 [INFO] [AsyncExecutor-1] [c.h.w.s.ClusterManager]: Connecting to 0 enabled cluster(s) on startup.  
2023-03-20 16:37:06,438 [INFO] [AsyncExecutor-2] [c.h.w.MCApplication]: Hazelcast Management Center 5.2.1 (20221201 - f06fa4a), Hazelcast client version: 5.2.1, embedded Jetty version: 9.4.49.v20220914  
2023-03-20 16:37:27,417 [INFO] [MC-Client-dev.lifecycle-1] [c.h.w.s.MCClientManager]: MC Client connected to cluster dev.  
2023-03-20 16:37:27,444 [INFO] [MC-Client-dev.event-2] [c.h.w.s.MCClientManager]: Started communication with member: Member [172.17.0.4]:5701 - f51099fa-36ab-4a5b-b6ed-943e8f7a36cc  
2023-03-20 16:37:27,445 [INFO] [MC-Client-dev.event-2] [c.h.w.s.MCClientManager]: Started communication with member: Member [172.17.0.2]:5701 - 6e063389-a6b8-49a5-82e0-45f1ea64f428  
2023-03-20 16:37:27,445 [INFO] [MC-Client-dev.event-2] [c.h.w.s.MCClientManager]: Started communication with member: Member [172.17.0.3]:5701 - 8ba808ef-2343-45b1-a8eb-ca21da420b08
```

Запускаємо 3 ноди і Management Center



Запускаємо код, який створює Distributed Map і додає в неї 1000 значень з ключем від 0 до 1к

```
task3 <
/home/karyna/Documents/APZ_lab2/task3/cmake-build-release-gcc/task3
20/03/2023 18:38:33.027 INFO: [139666888062528] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (8db230b1-956a-458e-80e8-bb32e1a3c224) is STARTING
20/03/2023 18:38:33.027 INFO: [139666888062528] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 18:38:33.027 INFO: [139666888062528] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 18:38:33.030 INFO: [139666888062528] hz.client_1[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 18:38:33.032 INFO: [139666888062528] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 18:38:33.032 INFO: [139666888062528] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:6e063389-a6b8-49a5-82e0-45f1ea64f428, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 18:38:33.032 INFO: [139666514664592] hz.client_1[dev] [5.2.0]


Members [3] {
  Member[172.17.0.4]:5701 - f51099fa-36ab-4a5b-b6ed-943e8f7a36cc
  Member[172.17.0.2]:5701 - 6e063389-a6b8-49a5-82e0-45f1ea64f428
  Member[172.17.0.3]:5701 - 8ba808ef-2343-45b1-a8eb-ca21da420b08
}

20/03/2023 18:38:33.033 INFO: [139666888062528] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.4:5701].
20/03/2023 18:38:33.034 INFO: [139666888062528] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.4:5701]:f51099fa-36ab-4a5b-b6ed-943e8f7a36cc, server version: 5.2.2, local address: Address[172.17.0.4:5701]
20/03/2023 18:38:33.034 INFO: [139666888062528] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.3:5701].
20/03/2023 18:38:33.036 INFO: [139666888062528] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.3:5701]:8ba808ef-2343-45b1-a8eb-ca21da420b08, server version: 5.2.2, local address: Address[172.17.0.3:5701]
20/03/2023 18:38:33.923 INFO: [139666903271744] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 18:38:33.923 INFO: [139666903271744] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.3:5701], connection: Connection{alive=0, connection id=3, remote endpoint=Address[172.17.0.3:5701]}
20/03/2023 18:38:33.923 INFO: [139666903271744] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.4:5701], connection: Connection{alive=0, connection id=2, remote endpoint=Address[172.17.0.4:5701]}
20/03/2023 18:38:33.923 INFO: [139666903271744] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 18:38:33.923 INFO: [139666903271744] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 18:38:33.927 INFO: [139666903271744] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN

Process finished with exit code 0
```

Розподіл значень по нодах: в кожній ноді +- третина значень

Map Statistics (In-Memory Format: BINARY)

[RESET TIME](#) 1 minute ago → now Default View   

Member ^	^ Entries	^ Gets	^ Puts	^ Removals	^ Sets	^ Entry Memory	^ Events	^ Hits
172.17.0.2:5701	338	0	338	0	0	44.81 kB	0	0
172.17.0.3:5701	334	0	334	0	0	44.28 kB	0	0
172.17.0.4:5701	328	0	328	0	0	43.50 kB	0	0
TOTAL	1000	0	1000	0	0	132.60 kB	0	0

1 – 3 of 3 Rows 10 ▾

Розподіл значень по нодах після видалення однієї із трьох нод: втрати даних не відбулося; розподіл приблизно по половині значень на ноду

Map Statistics (In-Memory Format: BINARY)

RESET TIME

1 minute ago

→

now

Default View

Member ^	^ Entries	^ Gets	^ Puts	^ Removals	^ Sets	^ Entry Memory	^ Events	^ Hits
172.17.0.2:5701	486	0	338	0	0	64.44 kB	0	0
172.17.0.4:5701	514	0	328	0	0	68.16 kB	0	0
TOTAL	1000	0	666	0	0	132.60 kB	0	0

1 – 2 of 2

Rows

10

Розподіл значень по нодах після видалення ще однієї ноди
через деякий час: втрати даних не відбулося

Map Statistics (In-Memory Format: BINARY)

RESET TIME

1 minute ago

→ now

Default View

+

Member ^	^ Entries	^ Gets	^ Puts	^ Removals	^ Sets	^ Entry Memory	^ Events	^ Hits
172.17.0.4:5701	1000	0	328	0	0	132.60 kB	0	0
TOTAL	1000	0	328	0	0	132.60 kB	0	0

1 – 1 of 1

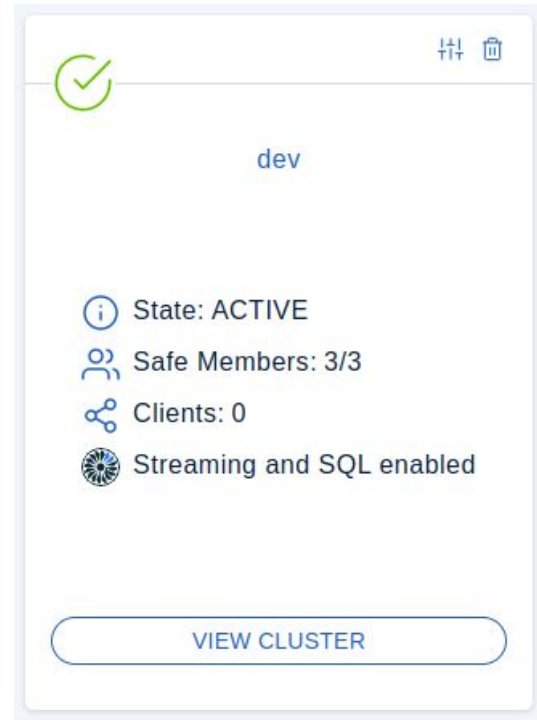
Rows 10


```
karyna@karyna: ~
]
2023-03-20 16:41:50,143 [ INFO] [hz.loving_golick.priority-generic-operation.thread-0] [c.h.i.p.t.PartitionStateManager]: [172.17.0.3]:5701 [dev] [5.2.2] Initializing cluster partition table arrangement...
2023-03-20 16:42:09,476 [ INFO] [hz.loving_golick.priority-generic-operation.thread-0] [c.h.c.i.p.t.AuthenticationMessageTask]: [172.17.0.3]:5701 [dev] [5.2.2] Received auth from Connection[id=3, /172.17.0.3:5701->/172.17.0.2:43333, qualifier=null, endpoint=[172.17.0.2]:43333, remoteUid=fb69e469-0082-40e6-8f90-8956f961104f, alive=true, connectionType=MCJVM, planeIndex=-1], successfully authenticated, clientUid: fb69e469-0082-40e6-8f90-8956f961104f, client name: MC-Client-dev, client version: 5.2.1
]

karyna@karyna: ~
and /172.17.0.5:5701
2023-03-20 16:41:50,096 [ INFO] [main] [c.h.j.i.JobCoordinationService]: [172.17.0.4]:5701 [dev] [5.2.2] Jet started scanning for jobs
2023-03-20 16:41:50,099 [ INFO] [main] [c.h.c.LifecycleService]: [172.17.0.4]:5701 [dev] [5.2.2] [172.17.0.4]:5701 is STARTED
2023-03-20 16:42:10,449 [ INFO] [hz.quitzical_kowalevski.priority-generic-operation.thread-0] [c.h.c.i.p.t.AuthenticationMessageTask]: [172.17.0.4]:5701 [dev] [5.2.2] Received auth from Connection[id=4, /172.17.0.4:5701->/172.17.0.2:52771, qualifier=null, endpoint=[172.17.0.2]:52771, remoteUid=fb69e469-0082-40e6-8f90-8956f961104f, alive=true, connectionType=MCJVM, planeIndex=-1], successfully authenticated, clientUid: fb69e469-0082-40e6-8f90-8956f961104f, client name: MC-Client-dev, client version: 5.2.1
]

karyna@karyna: ~ 101x27
2023-03-20 16:41:32,069 [ INFO] [main] [c.h.w.MCApplication]: Starting MCApplication v5.2.1 using Java 17.0.6 on 9e84a530ebfd with PID 1 (/opt/hazelcast/management-center/hazelcast-management-center-5.2.1.jar started by hazelcast in /opt/hazelcast/management-center)
2023-03-20 16:41:32,079 [ INFO] [main] [c.h.w.MCApplication]: No active profile set, falling back to 1 default profile: "default"
2023-03-20 16:41:35,406 [ INFO] [main] [c.h.w.c.SqlDbConfig]: Checking DB for required migrations.
2023-03-20 16:41:37,613 [ INFO] [main] [c.h.w.c.SqlDbConfig]: Number of applied DB migrations: 19.
2023-03-20 16:41:39,326 [ INFO] [main] [c.h.w.s.s.i.DisableLoginStrategy]: Login will be disabled for 5 seconds after 3 failed login attempts. For every 3 consecutive failed login attempts, disable period will be multiplied by 10.
2023-03-20 16:41:43,471 [ INFO] [main] [c.h.w.MCApplication]: Started MCApplication in 12.193 seconds (JVM running for 13.34)
2023-03-20 16:41:43,504 [ INFO] [AsyncExecutor-2] [c.h.w.MCApplication]: Hazelcast Management Center successfully started at http://localhost:8080
2023-03-20 16:41:43,546 [ INFO] [AsyncExecutor-1] [c.h.w.s.ClusterManager]: Connecting to 0 enabled cluster(s) on startup.
2023-03-20 16:41:43,553 [ INFO] [AsyncExecutor-2] [c.h.w.MCApplication]: Hazelcast Management Center 5.2.1 (20221201 - f06fa4a), Hazelcast client version: 5.2.1, embedded Jetty version: 9.4.49.v20220914
2023-03-20 16:42:09,496 [ INFO] [MC-Client-dev.lifecycle-1] [c.h.w.s.MCClientManager]: MC Client connected to cluster dev.
2023-03-20 16:42:09,536 [ INFO] [MC-Client-dev.event-2] [c.h.w.s.MCClientManager]: Started communication with member: Member [172.17.0.5]:5701 - 44290ead-1cfd-4e1f-881d-e2228bd94d70
2023-03-20 16:42:09,536 [ INFO] [MC-Client-dev.event-2] [c.h.w.s.MCClientManager]: Started communication with member: Member [172.17.0.4]:5701 - 0eb6da2f-c53e-4ac1-9718-41acbe34cc18
2023-03-20 16:42:09,536 [ INFO] [MC-Client-dev.event-2] [c.h.w.s.MCClientManager]: Started communication with member: Member [172.17.0.3]:5701 - e6180f71-5562-4e1c-820d-b5c5e459eddd4
```

Запускаємо 3 ноди і Management Center



Запускаємо код, який створює Distributed Map і додає в неї 1000 значень з ключем від 0 до 1к

task3

/home/karyna/Documents/AP2_lab2/task3/cmake-build-release-gcc/task3

```
20/03/2023 18:42:54.578 INFO: [139779884709440] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (b58aca2b-2f79-406a-b748-1f25b4b289a7) is STARTING
20/03/2023 18:42:54.578 INFO: [139779884709440] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 18:42:54.578 INFO: [139779884709440] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 18:42:54.580 INFO: [139779884709440] hz.client_1[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 18:42:54.583 INFO: [139779884709440] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 18:42:54.583 INFO: [139779884709440] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.3:5701]:e6180f71-5562-4e1c-820d-b5c5e459edd4, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 18:42:54.583 INFO: [139779509188160] hz.client_1[dev] [5.2.0]
```




```
Members [3] {
  Member[172.17.0.5]:5701 - 44290ead-1cfd-4e1f-881d-e2228bd94d70
  Member[172.17.0.4]:5701 - 0eb6da2f-c53e-4ac1-9718-41acbe34cc18
  Member[172.17.0.3]:5701 - e6180f71-5562-4e1c-820d-b5c5e459edd4
}
```

```
20/03/2023 18:42:54.583 INFO: [139779884709440] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.5:5701].
20/03/2023 18:42:54.585 INFO: [139779884709440] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.5:5701]:44290ead-1cfd-4e1f-881d-e2228bd94d70, server version: 5.2.2, local address: Address[172.17.0.5:5701]
20/03/2023 18:42:54.585 INFO: [139779884709440] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.4:5701].
20/03/2023 18:42:54.587 INFO: [139779884709440] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.4:5701]:0eb6da2f-c53e-4ac1-9718-41acbe34cc18, server version: 5.2.2, local address: Address[172.17.0.4:5701]
20/03/2023 18:42:55.469 INFO: [139779891673408] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 18:42:55.469 INFO: [139779891673408] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.4:5701], connection: Connection{alive=0, connection id=3, remote endpoint=Address[172.17.0.4:5701]}
20/03/2023 18:42:55.469 INFO: [139779891673408] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.5:5701], connection: Connection{alive=0, connection id=2, remote endpoint=Address[172.17.0.5:5701]}
20/03/2023 18:42:55.469 INFO: [139779891673408] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.3:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.3:5701]}
20/03/2023 18:42:55.469 INFO: [139779891673408] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 18:42:55.473 INFO: [139779891673408] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
```

Process finished with exit code 0

Розподіл значень по нодах: в кожній ноді +- третина значень

Map Statistics (In-Memory Format: BINARY)

[RESET TIME](#) 1 minute ago → now Default View   

Member ^	^ Entries	^ Gets	^ Puts	^ Removals	^ Sets	^ Entry Memory	^ Events	^ Hits
172.17.0.3:5701	295	0	295	0	0	39.13 kB	0	0
172.17.0.4:5701	340	0	340	0	0	45.07 kB	0	0
172.17.0.5:5701	365	0	365	0	0	48.40 kB	0	0
TOTAL	1000	0	1000	0	0	132.60 kB	0	0

1 - 3 of 3 Rows 10 ▾

Розподіл значень по нодах після видалення однієї ноди і одразу іншої: відбулася втрата даних; 674 значення, які лишилися, лежать в одній ноді

Map Statistics (In-Memory Format: BINARY)					RESET TIME	1 minute ago	→	now	Default View			
Member ^	^ Entries	^ Gets	^ Puts	^ Removals	^ Sets	^ Entry Memory	^ Events	^ Hits				
172.17.0.5:5701	674	0	365	0	0	89.37 kB	0	0				
TOTAL	674	0	365	0	0	89.37 kB	0	0				

1 – 1 of 1 Rows 10

Пункт 4

Три клієнти запускаються як три потоки
однієї програми

Optimistic locking

```
test_locking x
/home/karyna/Documents/APZ_lab2/task4/cmake-build-release-gcc/test_locking
Test optimistic_locking
20/03/2023 19:03:21.381 INFO: [139910822491712] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (4f34eb3c-2b88-4f85-b7ea-a588171ebf37) is STARTING
20/03/2023 19:03:21.381 INFO: [139910822491712] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 19:03:21.381 INFO: [139910822491712] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 19:03:21.383 INFO: [139910822491712] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.1:5701].
20/03/2023 19:03:21.407 INFO: [139910822491712] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 19:03:21.407 INFO: [139910822491712] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:dafefb0c-2179-4c39-a213-a374840a959d, server version: 5.2.2, local address: Address[172.17.0.1:5701]
20/03/2023 19:03:21.410 INFO: [139910446974528] hz.client_1[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - dafefb0c-2179-4c39-a213-a374840a959d
}

Starting
thread 0
thread 1
thread 2

Finishing
20/03/2023 19:03:21.484 INFO: [139910287513152] hz.client_2[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (39adecfb-f4f9-4445-9e18-6f2fd122102b) is STARTING
20/03/2023 19:03:21.484 INFO: [139910287513152] hz.client_2[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 19:03:21.484 INFO: [139910287513152] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 19:03:21.484 INFO: [139910270727744] hz.client_3[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (ca3a942c-e0b6-4cf7-82f4-4db7cfa967f) is STARTING
20/03/2023 19:03:21.484 INFO: [139910270727744] hz.client_3[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 19:03:21.484 INFO: [139910270727744] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 19:03:21.484 INFO: [139910262335040] hz.client_4[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (15ac716f-1a99-43be-8183-416d21589302) is STARTING
20/03/2023 19:03:21.484 INFO: [139910262335040] hz.client_4[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 19:03:21.484 INFO: [139910262335040] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 19:03:21.489 INFO: [139910287513152] hz.client_2[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 19:03:21.490 INFO: [139910270727744] hz.client_3[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 19:03:21.490 INFO: [139910262335040] hz.client_4[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 19:03:21.494 INFO: [139910287513152] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 19:03:21.494 INFO: [139910287513152] hz.client_2[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:dafefb0c-2179-4c39-a213-a374840a959d, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 19:03:21.494 INFO: [139910270727744] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 19:03:21.495 INFO: [139910262335040] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 19:03:21.495 INFO: [139910270727744] hz.client_3[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:dafefb0c-2179-4c39-a213-a374840a959d, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 19:03:21.495 INFO: [139910262335040] hz.client_4[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:dafefb0c-2179-4c39-a213-a374840a959d, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 19:03:21.495 INFO: [139908508980800] hz.client_2[dev] [5.2.0]
```

Optimistic locking: значення збільшується на $3 \times 1000 = 3000$

```
test_locking x
Members [1] {
  Member[172.17.0.2]:5701 - dafefb0c-2179-4c39-a213-a374840a959d
}

20/03/2023 19:03:21.495 INFO: [139908341126720] hz.client_4[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - dafefb0c-2179-4c39-a213-a374840a959d
}

20/03/2023 19:03:21.495 INFO: [139908357912128] hz.client_3[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - dafefb0c-2179-4c39-a213-a374840a959d
}

20/03/2023 19:03:54.886 INFO: [139910270727744] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 19:03:54.887 INFO: [139910270727744] hz.client_4[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 19:03:54.887 INFO: [139910270727744] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 19:03:54.892 INFO: [139910270727744] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
20/03/2023 19:03:55.162 INFO: [139907754358336] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 19:03:55.162 INFO: [139907754358336] hz.client_3[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 19:03:55.162 INFO: [139907754358336] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 19:03:55.166 INFO: [139907754358336] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
20/03/2023 19:03:56.631 INFO: [139907905328704] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 19:03:56.631 INFO: [139907905328704] hz.client_2[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 19:03:56.631 INFO: [139907905328704] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 19:03:56.634 INFO: [139907905328704] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
thread 0
thread 1
thread 2
FinishedResult 3000
20/03/2023 19:03:56.638 INFO: [139910279120448] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 19:03:56.638 INFO: [139910279120448] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 19:03:56.638 INFO: [139910279120448] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 19:03:56.640 INFO: [139910279120448] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN

Process finished with exit code 0
```


Pessimistic locking

```
test_locking x
/home/karyna/Documents/AP2_lab2/task4/cmake-build-release-gcc/test_locking
Test pessimistic_locking
20/03/2023 21:36:33.104 INFO: [139628822656576] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (09bcb926-2266-4ac9-adbb-d06e419c994e) is STARTING
20/03/2023 21:36:33.104 INFO: [139628822656576] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:36:33.104 INFO: [139628822656576] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:36:33.107 INFO: [139628822656576] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.1:5701].
20/03/2023 21:36:33.130 INFO: [139628822656576] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:36:33.130 INFO: [139628822656576] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:533bd3a3-f561-44cb-b084-fa727f182eee, server version: 5.2.2, local address: Address[172.17.0.1:5701].
20/03/2023 21:36:33.133 INFO: [139628447135296] hz.client_1[dev] [5.2.0]

Members [1] {
    Member[172.17.0.2]:5701 - 533bd3a3-f561-44cb-b084-fa727f182eee
}

Starting
thread 0
thread 1
thread 2

Finishing
20/03/2023 21:36:33.206 INFO: [139628287673920] hz.client_2[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (d46dcd42-4404-437a-b20c-d5502d309b8c) is STARTING
20/03/2023 21:36:33.206 INFO: [139628287673920] hz.client_2[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:36:33.206 INFO: [139628287673920] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:36:33.206 INFO: [139628270888512] hz.client_3[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (08d8aefe-bb69-4162-b0d0-237f98a08a02) is STARTING
20/03/2023 21:36:33.206 INFO: [139628270888512] hz.client_3[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:36:33.206 INFO: [139628270888512] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:36:33.206 INFO: [139628262495808] hz.client_4[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (6446233a-5685-439a-80f3-4b3a906df520) is STARTING
20/03/2023 21:36:33.206 INFO: [139628262495808] hz.client_4[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:36:33.206 INFO: [139628262495808] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:36:33.211 INFO: [139628287673920] hz.client_2[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 21:36:33.211 INFO: [139628270888512] hz.client_3[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 21:36:33.211 INFO: [139628262495808] hz.client_4[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 21:36:33.215 INFO: [139628287673920] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:36:33.215 INFO: [139628270888512] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:36:33.215 INFO: [139628287673920] hz.client_2[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:533bd3a3-f561-44cb-b084-fa727f182eee, server version: 5.2.2, local address: Address[127.0.0.1:5701].
20/03/2023 21:36:33.215 INFO: [139628270888512] hz.client_3[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:533bd3a3-f561-44cb-b084-fa727f182eee, server version: 5.2.2, local address: Address[127.0.0.1:5701].
20/03/2023 21:36:33.215 INFO: [139628262495808] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:36:33.216 INFO: [139628262495808] hz.client_4[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:533bd3a3-f561-44cb-b084-fa727f182eee, server version: 5.2.2, local address: Address[127.0.0.1:5701].
20/03/2023 21:36:33.217 INFO: [139626416821824] hz.client_3[dev] [5.2.0]
```

Pessimistic locking: значення збільшується на $3 \times 1000 = 3000$

```
test_locking x
Members [1] {
  Member[172.17.0.2]:5701 - 533bd3a3-f561-44cb-b084-fa727f182eee
}

20/03/2023 21:36:33.217 INFO: [139626492356160] hz.client_2[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - 533bd3a3-f561-44cb-b084-fa727f182eee
}

20/03/2023 21:36:33.217 INFO: [139626307716672] hz.client_4[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - 533bd3a3-f561-44cb-b084-fa727f182eee
}

20/03/2023 21:37:12.321 INFO: [139628262495808] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:37:12.321 INFO: [139628262495808] hz.client_3[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:37:12.321 INFO: [139628262495808] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:37:12.326 INFO: [139628262495808] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
20/03/2023 21:37:12.334 INFO: [139626022364736] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:37:12.335 INFO: [139626022364736] hz.client_4[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:37:12.335 INFO: [139626022364736] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:37:12.338 INFO: [139626022364736] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
20/03/2023 21:37:12.347 INFO: [139625762911808] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:37:12.347 INFO: [139625762911808] hz.client_2[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:37:12.347 INFO: [139625762911808] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:37:12.351 INFO: [139625762911808] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
thread 0
thread 1
thread 2
FinishedResult 3000
20/03/2023 21:37:12.354 INFO: [139628279281216] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:37:12.354 INFO: [139628279281216] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:37:12.354 INFO: [139628279281216] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:37:12.356 INFO: [139628279281216] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN

Process finished with exit code 0
```

Without locking

```
test_locking x
/home/karvna/Documents/AP7_lab2/task4/cmake-build-release-gcc/test_locking
Test without_locking
20/03/2023 21:41:18.593 INFO: [139828991620672] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (4f2dbcdb-3789-4d9f-983f-1c296d41c4de) is STARTING
20/03/2023 21:41:18.593 INFO: [139828991620672] hz.client_1[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:41:18.593 INFO: [139828991620672] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:41:18.596 INFO: [139828991620672] hz.client_1[dev] [5.2.0] Trying to connect to Address[172.17.0.1:5701].
20/03/2023 21:41:18.616 INFO: [139828991620672] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:41:18.616 INFO: [139828991620672] hz.client_1[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:2198f6ef-614b-42da-8d7b-d320bb9398d4, server version: 5.2.2, local address: Address[172.17.0.1:5701]
20/03/2023 21:41:18.619 INFO: [139828616091200] hz.client_1[dev] [5.2.0]

Members [1] {
    Member[172.17.0.2]:5701 - 2198f6ef-614b-42da-8d7b-d320bb9398d4
}

Starting
thread 0
thread 1
thread 2

Finishing
20/03/2023 21:41:18.684 INFO: [139827827701312] hz.client_3[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (9e63eb55-64ce-49dc-8acd-db02c4fa0602) is STARTING
20/03/2023 21:41:18.685 INFO: [139827827701312] hz.client_3[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:41:18.685 INFO: [139827827701312] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:41:18.684 INFO: [139828456629824] hz.client_2[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (f71888d7-4208-4a45-b212-8ddd31e1a67d) is STARTING
20/03/2023 21:41:18.685 INFO: [139827819308608] hz.client_4[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent Client (d81e8e4e-0f69-4b3b-b0c4-28a0fdc15fea) is STARTING
20/03/2023 21:41:18.685 INFO: [139827819308608] hz.client_4[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:41:18.685 INFO: [139828456629824] hz.client_2[dev] [5.2.0] (NOT_FOUND:NOT_FOUND) LifecycleService::LifecycleEvent STARTING
20/03/2023 21:41:18.685 INFO: [139828456629824] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:41:18.685 INFO: [139827819308608] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent STARTED
20/03/2023 21:41:18.690 INFO: [139827819308608] hz.client_4[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 21:41:18.691 INFO: [139828456629824] hz.client_2[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 21:41:18.690 INFO: [139827827701312] hz.client_3[dev] [5.2.0] Trying to connect to Address[127.0.0.1:5701].
20/03/2023 21:41:18.695 INFO: [139827819308608] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:41:18.695 INFO: [139827819308608] hz.client_4[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:2198f6ef-614b-42da-8d7b-d320bb9398d4, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 21:41:18.695 INFO: [139828456629824] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:41:18.695 INFO: [139828456629824] hz.client_2[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:2198f6ef-614b-42da-8d7b-d320bb9398d4, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 21:41:18.696 INFO: [139827827701312] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_CONNECTED
20/03/2023 21:41:18.696 INFO: [139827827701312] hz.client_3[dev] [5.2.0] Authenticated with server Address[172.17.0.2:5701]:2198f6ef-614b-42da-8d7b-d320bb9398d4, server version: 5.2.2, local address: Address[127.0.0.1:5701]
20/03/2023 21:41:18.696 INFO: [139826694915648] hz.client_4[dev] [5.2.0]
```


Without locking: значення збільшується на 1001!=3000

```
test_locking x

Members [1] {
  Member[172.17.0.2]:5701 - 2198f6ef-614b-42da-8d7b-d320bb9398d4
}

20/03/2023 21:41:18.697 INFO: [139826459919936] hz.client_2[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - 2198f6ef-614b-42da-8d7b-d320bb9398d4
}

20/03/2023 21:41:18.697 INFO: [139826527061568] hz.client_3[dev] [5.2.0]

Members [1] {
  Member[172.17.0.2]:5701 - 2198f6ef-614b-42da-8d7b-d320bb9398d4
}

20/03/2023 21:41:30.718 INFO: [139827827701312] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:41:30.719 INFO: [139827827701312] hz.client_3[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:41:30.719 INFO: [139827827701312] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:41:30.724 INFO: [139827827701312] hz.client_3[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
20/03/2023 21:41:30.731 INFO: [139826049300032] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:41:30.731 INFO: [139827827701312] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:41:30.731 INFO: [139826049300032] hz.client_2[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:41:30.731 INFO: [139826049300032] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:41:30.731 INFO: [139827827701312] hz.client_4[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:41:30.731 INFO: [139827827701312] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:41:30.734 INFO: [139826049300032] hz.client_2[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN
20/03/2023 21:41:30.734 INFO: [139827827701312] hz.client_4[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN

thread 0
thread 1
thread 2
FinishedResult 1001
20/03/2023 21:41:30.737 INFO: [139828448237120] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTTING_DOWN
20/03/2023 21:41:30.738 INFO: [139828448237120] hz.client_1[dev] [5.2.0] Removed connection to endpoint: Address[172.17.0.2:5701], connection: Connection{alive=0, connection id=1, remote endpoint=Address[172.17.0.2:5701]}
20/03/2023 21:41:30.738 INFO: [139828448237120] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent CLIENT_DISCONNECTED
20/03/2023 21:41:30.739 INFO: [139828448237120] hz.client_1[dev] [5.2.0] LifecycleService::LifecycleEvent SHUTDOWN

Process finished with exit code 0
```

Пункт 5

Для запуску докер-контейнера з підключенням yml файлу

```
karyna@karyna:~/Documents/APZ_lab2/task5$ docker run -v "$(pwd)"/bounded_queue.yml:/opt/hazelcast/bounded_queue.yml -e HAZELCAST_CONFIG=bounded_queue.yml -p:5701:5701 hazelcast/hazelcast
```

```
Consumer 1: 0
Producer 1: 0
Consumer 2: 1
Producer 1: 1
Producer 1: 2
Producer 1: 3
Producer 1: 4
Consumer 1: 2
Producer 1: 5
Consumer 2: 3
Producer 1: 6
Producer 1: 7
Producer 1: 8
Producer 1: 9
Consumer 1: 4
Producer 1: 10
Consumer 2: 5
Producer 1: 11
Producer 1: 12
Producer 1: 13
Producer 1: 14
Consumer 1: 6
Producer 1: 15
Consumer 2: 7
Producer 1: 16
Producer 1: 17
```

- клієнти запущені як 3 потоки: 1 на записування і 2 на читання
- дані записуються в чергу кожну секунду
- дані читаються з черги кожні 5 секунд
- як будуть вичитуватись значення з черги, якщо є декілька читачів?
 - оскільки всі читачі працюють на одній частоті і всі дані однакового розміру, то читачі вичитують їх по черзі


```
Producer 1: 0  
Producer 1: 1  
Producer 1: 2  
Producer 1: 3  
Producer 1: 4  
Producer 1: 5  
Producer 1: 6  
Producer 1: 7  
Producer 1: 8  
Producer 1: 9
```

- запущений тільки клієнт на записування даних
- дані записуються в чергу кожну 1 секунду
- дані не читаються з черги
- максимальний розмір черги – 10
- перевірте, яка буде поведінка на запис, якщо відсутнє читання, і черга заповнена
 - запис нових значень призупиниться в момент, коли черга досягне свого максимального значення (10 значень)
 - нові значення не будуть додаватися, допоки не вчитається хоча б одне значення з черги