



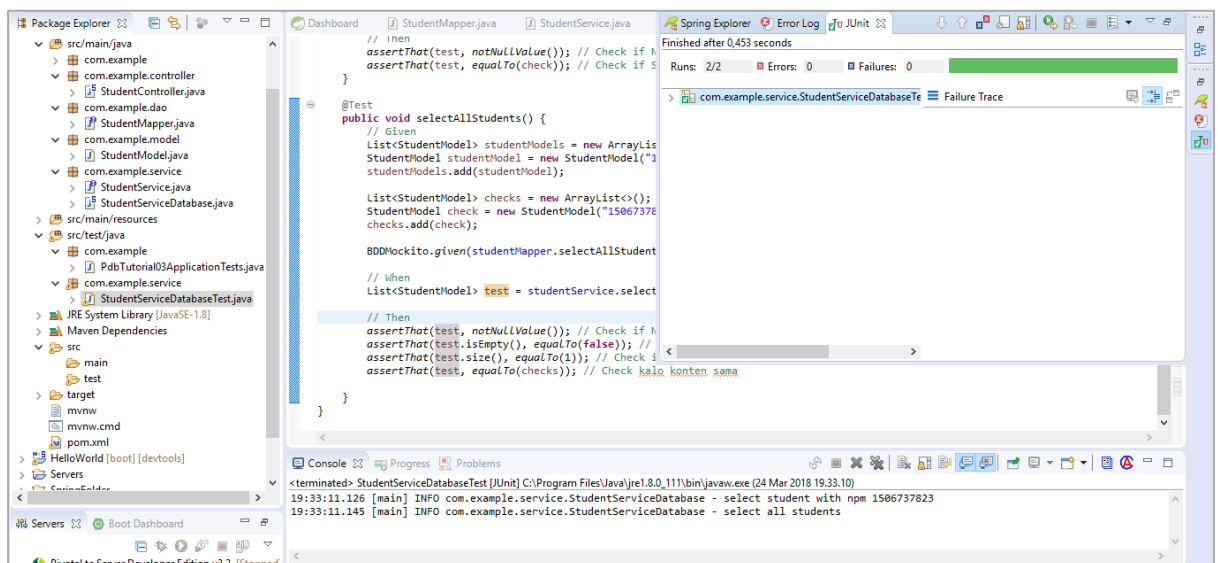
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Kelas : SI Ekstensi

OUTLINE

Pada tutorial 6 ini kita mempelajari tentang unit testing dan load testing. Unit testing dijalankan menggunakan dependency Junit & Mockito, dilakukan pada method yang telah dibuat pada tutorial 5. Pada tutorial ini menggunakan JMeter untuk melakukan load testing.

Latihan Unit Testing

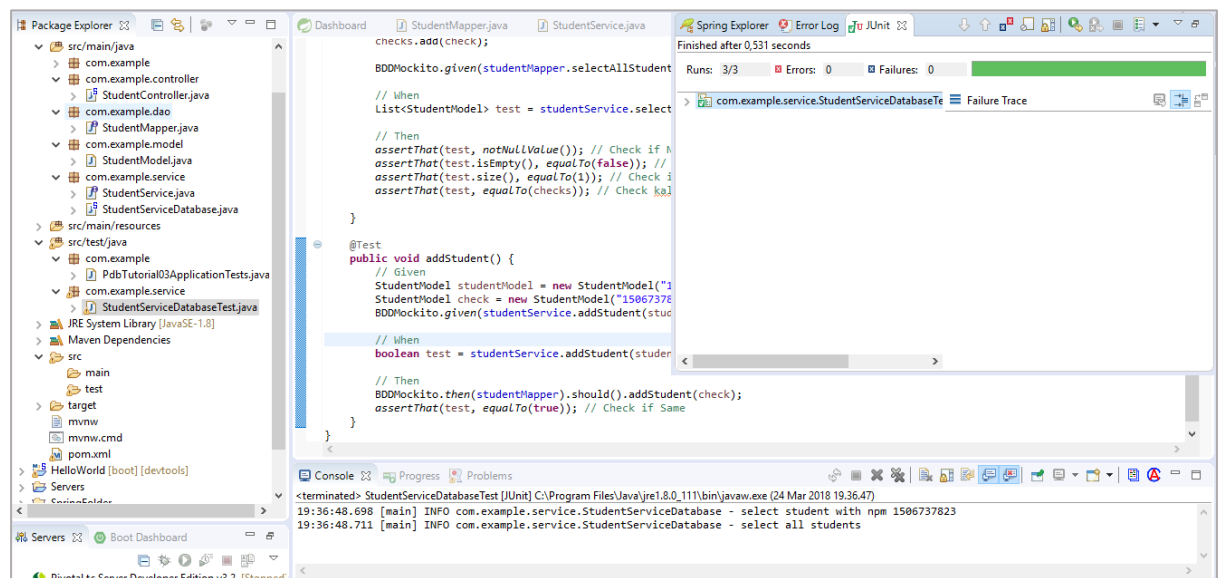
1. Jelaskan apa yang terjadi pada method tersebut berikut dengan hasil testing-nya!



- Method selectAllStudent

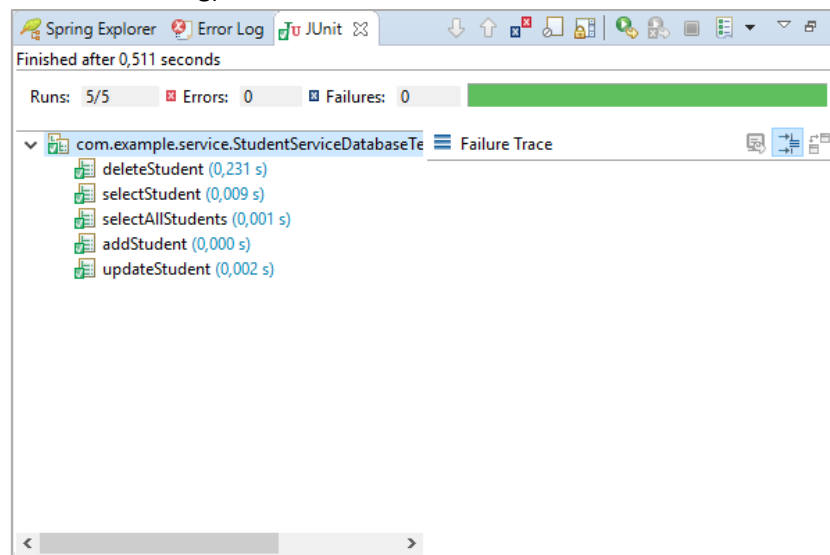
Pertama, menginisialisasi object berupa list dengan nama studentModel. Lalu, Mockito akan menggantikan selectAllStudent dengan return studentModels. Setelah itu, dilakukan testing terhadap method selectAllStudents, lalu di cek jika tidak null/kosong jika ukuran sama dan konten juga sama.

2. Jelaskan apa yang terjadi pada method tersebut berikut dengan hasil testing-nya



Pertama, buat object `studentModel` yang diisi dengan data student. Lalu, dibuat object dengan nama `check` yang diisi oleh data student. Setelah itu, memanggil method `AddStudent` pada `studentService` yang mengembalikan nilai `true`. Selanjutnya Mockito memeriksa value dari test apakah bernilai `true/false`.

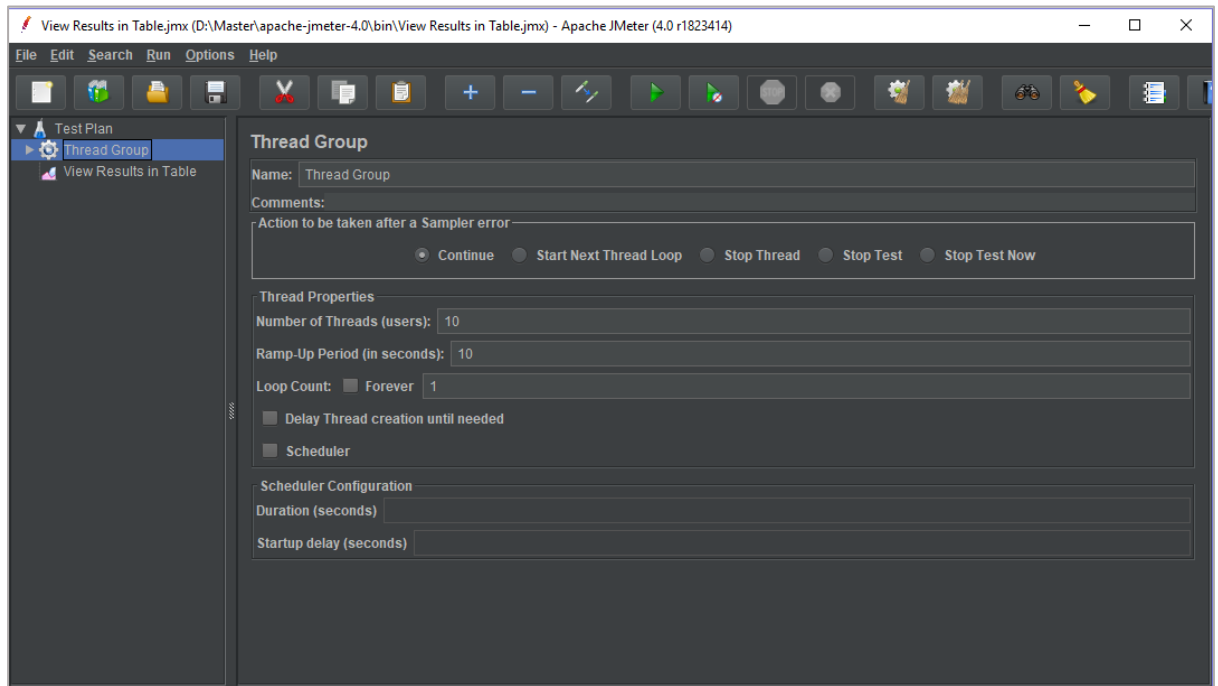
3. Lakukan testing terhadap method `delete student` dan `update student`! (cukup lampirkan screenshot akhir dari testing)



Load Testing Dengan Apache Jmeter

- **jmeter_selectStudentBerhasil**

Berikut merupakan tampilan Thread Group yang menampilkan hasil dari load testing yang dijalankan. Load testing dilakukan menggunakan JMeter untuk selectStudentBerhasil. Pada kolom number of Threads (users) diinputkan 10 disesuaikan dengan kemampuan RAM komputer. Ketika dicoba 20, masih belum berhasil. Lalu dikecilkan lagi angkanya menjadi 10, dan berhasil.



Berikut merupakan hasil dari load testing selectStudentBerhasil (npm student ditemukan)

The screenshot shows the 'View Results in Table' window in Apache JMeter. It displays a table of test results for 10 samples. All samples have a status of 'Success' (indicated by a green checkmark). The table includes columns for Sample #, Start Time, Thread Name, Label, Sample Time, Status, Bytes, Sent Bytes, Latency, and Connect Time.

Sample #	Start Time	Thread Name	Label	Sample Time...	Status	Bytes	Sent Bytes	Latency	Connect Time
1	20:38:49.407	Thread Grou...	HTTP Request	971	Success	2649305	133	903	
2	20:38:50.409	Thread Grou...	HTTP Request	819	Success	2649305	133	751	
3	20:38:51.410	Thread Grou...	HTTP Request	964	Success	2649305	133	847	
4	20:38:52.416	Thread Grou...	HTTP Request	1026	Success	2649305	133	938	
5	20:38:53.411	Thread Grou...	HTTP Request	968	Success	2649305	133	809	
6	20:38:54.413	Thread Grou...	HTTP Request	1254	Success	2649305	133	1167	
7	20:38:55.412	Thread Grou...	HTTP Request	911	Success	2649305	133	841	
8	20:38:56.413	Thread Grou...	HTTP Request	844	Success	2649305	133	755	
9	20:38:57.412	Thread Grou...	HTTP Request	856	Success	2649305	133	789	
10	20:38:58.412	Thread Grou...	HTTP Request	1073	Success	2649305	133	842	

- Cek dengan NPM yang telah tersedia:

← → ↻ ⓘ localhost:8080/student/view/12345

NPM = 12345

Name = Riandani Gita Larasati

GPA = 4.0

View Results in Table.jmx (D:\Master\apache-jmeter-4.0\bin\View Results in Table.jmx) - Apache JMeter (4.0 r1823414)

File Edit Search Run Options Help

Test Plan
Thread Group
HTTP Request
View Results in Table

View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

Filename Browse... Log/Display Only: ☐ Errors ☒ Successes ☐ Failures

Sample #	Start Time	Thread Name	Label	Sample Time	Status	Bytes	Sent Bytes	Latency	Connect Time
1	20:43:43.027	Thread Grou...	HTTP Request	32	✓	382	136	32	
2	20:43:44.029	Thread Grou...	HTTP Request	16	✓	382	136	16	
3	20:43:45.029	Thread Grou...	HTTP Request	11	✓	382	136	11	
4	20:43:46.029	Thread Grou...	HTTP Request	12	✓	382	136	12	
5	20:43:47.030	Thread Grou...	HTTP Request	16	✓	382	136	15	
6	20:43:48.059	Thread Grou...	HTTP Request	14	✓	382	136	14	
7	20:43:49.061	Thread Grou...	HTTP Request	14	✓	382	136	14	
8	20:43:50.061	Thread Grou...	HTTP Request	13	✓	382	136	13	
9	20:43:51.062	Thread Grou...	HTTP Request	15	✓	382	136	15	
10	20:43:52.062	Thread Grou...	HTTP Request	12	✓	382	136	12	

- Cek apabila NPM salah:

← → ↻ ⓘ localhost:8080/student/view/11111

Student not found

NPM = 11111

View Results in Table.jmx (D:\Master\apache-jmeter-4.0\bin\View Results in Table.jmx) - Apache JMeter (4.0 r1823414)

File Edit Search Run Options Help

Test Plan
Thread Group
HTTP Request
View Results in Table

View Results in Table

Name: View Results in Table

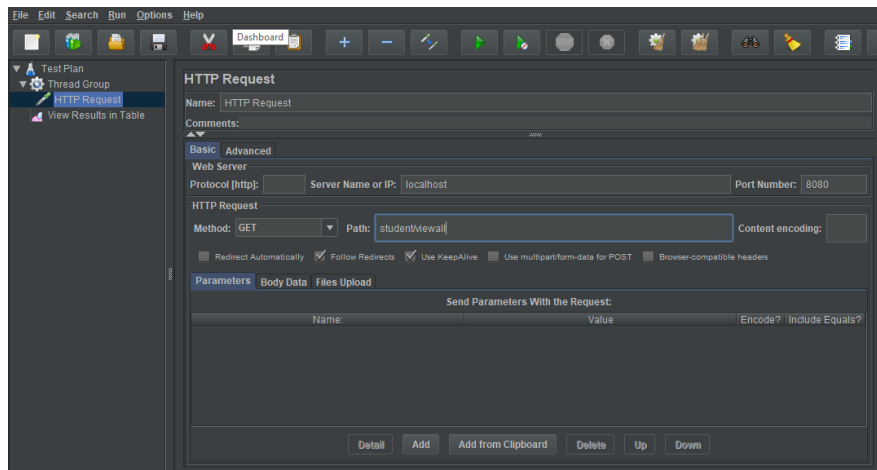
Comments:

Write results to file / Read from file

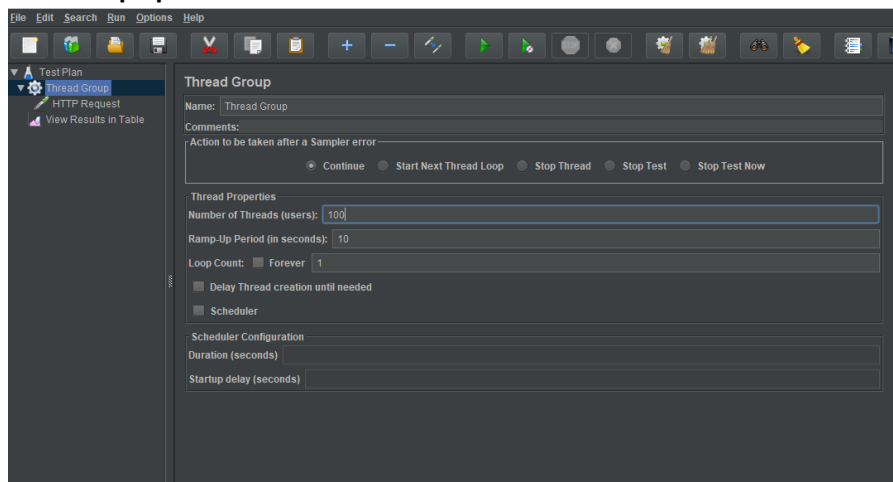
Filename Browse... Log/Display Only: ☐ Errors ☒ Successes ☐ Failures

Sample #	Start Time	Thread Name	Label	Sample Time	Status	Bytes	Sent Bytes	Latency	Connect Time
1	20:46:20.112	Thread Grou...	HTTP Request	13	✓	337	136	13	
2	20:46:21.111	Thread Grou...	HTTP Request	13	✓	337	136	13	
3	20:46:22.111	Thread Grou...	HTTP Request	13	✓	337	136	13	
4	20:46:23.111	Thread Grou...	HTTP Request	112	✓	337	136	112	
5	20:46:24.113	Thread Grou...	HTTP Request	14	✓	337	136	14	
6	20:46:25.112	Thread Grou...	HTTP Request	11	✓	337	136	11	
7	20:46:26.115	Thread Grou...	HTTP Request	15	✓	337	136	15	
8	20:46:27.115	Thread Grou...	HTTP Request	12	✓	337	136	12	
9	20:46:28.116	Thread Grou...	HTTP Request	11	✓	337	136	11	
10	20:46:29.114	Thread Grou...	HTTP Request	11	✓	337	136	11	

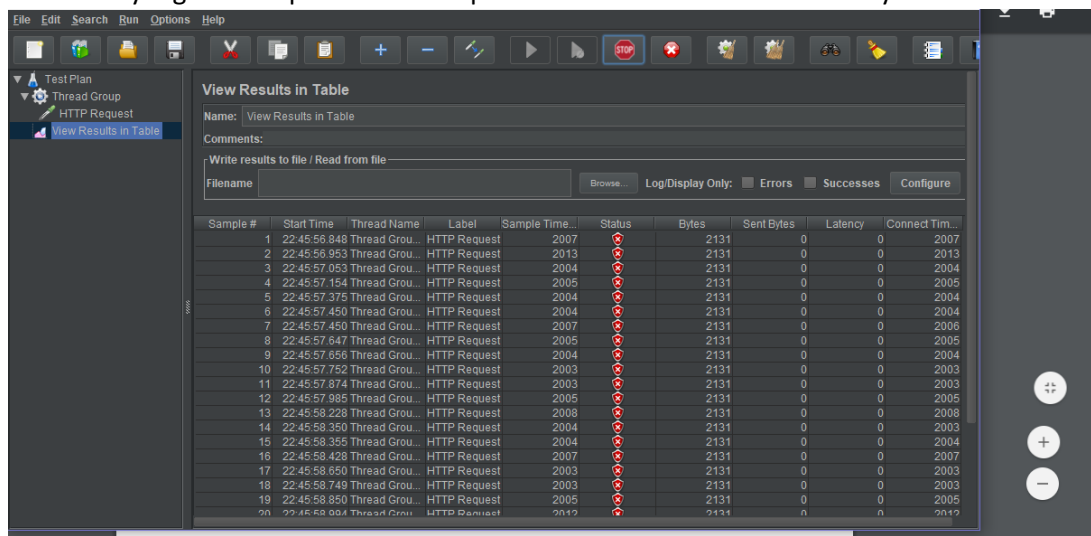
- Cek view All



Kondisi apa permintaan load user 100:



Berikut hasil load testing selectAllStudent. Namun terjadi eror karena kemampuan hardware yang tidak dapat memenuhi permintaan untuk load user sebanyak 100.



Ketika diganti menjadi 20:

File Edit Search Run Options Help

Test Plan
Thread Group
HTTP Request
View Results in Table

View Results in Table

Name: View Results in Table

Comments:

Write results to file / Read from file

Filename Log/Display Only: ☐ Errors ☒ Successes

Sample #	Start Time	Thread Name	Label	Sample Time...	Status	Bytes	Sent Bytes	Latency	Connect Time
1	22:50:15.477	Thread Grou...	HTTP Request	10128	✓	2649305	133	9260	
2	22:50:15.993	Thread Grou...	HTTP Request	9697	✓	2649305	133	9153	
3	22:50:16.493	Thread Grou...	HTTP Request	10053	✓	2649305	133	8738	
4	22:50:16.994	Thread Grou...	HTTP Request	13541	✓	2649305	133	13012	
5	22:50:17.999	Thread Grou...	HTTP Request	14184	✓	2649305	133	13211	
6	22:50:17.494	Thread Grou...	HTTP Request	14790	✓	2649305	133	13800	
7	22:50:18.495	Thread Grou...	HTTP Request	13825	✓	2649305	133	12726	
8	22:50:18.996	Thread Grou...	HTTP Request	14127	✓	2649305	133	13551	
9	22:50:20.998	Thread Grou...	HTTP Request	12857	✓	2649305	133	12374	
10	22:50:19.996	Thread Grou...	HTTP Request	17101	✓	2649305	133	13769	
11	22:50:20.503	Thread Grou...	HTTP Request	16594	✓	2649305	133	13010	
12	22:50:21.497	Thread Grou...	HTTP Request	15600	✓	2649305	133	12186	
13	22:50:19.495	Thread Grou...	HTTP Request	18408	✓	2649305	133	17598	
14	22:50:21.997	Thread Grou...	HTTP Request	15950	✓	2649305	133	15746	
15	22:50:23.998	Thread Grou...	HTTP Request	13953	✓	2649305	133	13742	
16	22:50:23.498	Thread Grou...	HTTP Request	14455	✓	2649305	133	14242	
17	22:50:22.998	Thread Grou...	HTTP Request	14957	✓	2649305	133	14742	
18	22:50:24.499	Thread Grou...	HTTP Request	13749	✓	2649305	133	13241	
19	22:50:22.500	Thread Grou...	HTTP Request	18269	✓	2649305	133	15440	
20	22:50:24.002	Thread Grou...	HTTP Request	15772	✓	2649305	133	12051	

Ketika diganti jadi 20, maka kemampuannya sesuai dan statusnya berhasil.