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Ringkasan

Dalam tutorial ini, saya mempelajari bagaimana testing yang dapat dilakukan untuk program yang sudah dibuat baik dari segi method, class dan banyaknya user yang melakukan akses. Untuk melakukan Unit Testing (tes method, class dll) menggunakan JUnit & Mockito sedangkan untuk melakukan Load Testing (banyaknya user yang melakukan akses) menggunakan Apache JMeter.

Latihan Unit Testing

1. Penjelasan pengecekan method selectAllStudents

Pada file StudentServiceDatabasetest ditambahkan beberapa kode juga fungsinya antara lain,
//Given

Menambahkan data student ke dalam 2 buah list studentModels dan chek bertipe objek StudentModel.

Kode program BDMMockinto berfungsi untuk memanggil method selectAllStudents dan akan melakukan return studentModels dengan tipe data list of StudentModel

//When

Memanggil method selectAllStudents yang hasilnya bertipe list of StudentModel dan ditampung ke variable test

//Then

assertThat(test, notNullValue());

→Melakukan pengecekan variable test memiliki nilai (not null) atau tidak.

assertThat(test.isEmpty(), equalTo(false));

→Melakukan pengecekan isi dari test, jika kosong makamengembalikan nilai false.

assertThat(test.size(), equalTo(1));

→Pelakukan panjang pengetesan program dari test yaitu 1.

assertThat(test, equalTo(checks));

→Melakukan test apakah sama dengan list checks.

2. Penjelasan pengecekan method addStudent

// Given

Objek studentModel dan check dibuat dengan type data StudentModel. Kemudian kode program BDDMockito digunakan untuk melakukan pengecekan jika addStudent dipanggil maka akan mengembalikan nilai true.

// When

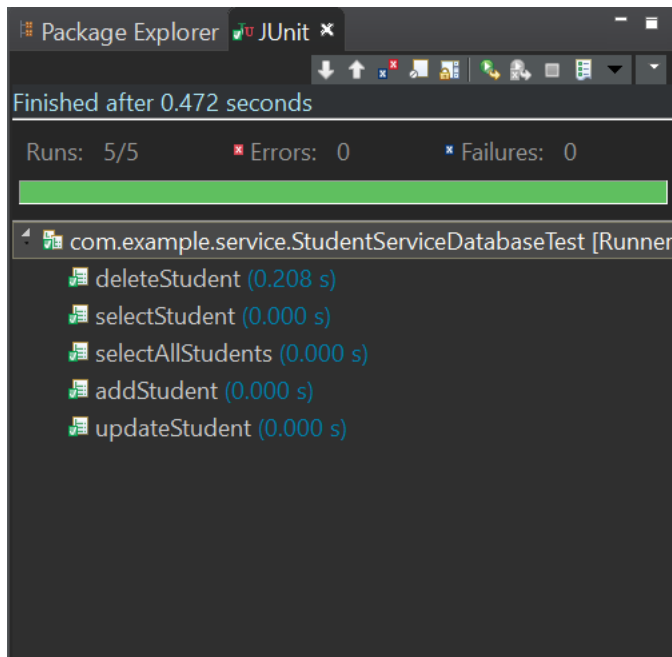
Melakukan pemanggilan method addStudent kemudian hasilnya dimasukan ke variable test dengan tipe Boolean karena pada given mengembalikan nilai true

// Then

Melakukan pengecekan nilai test apakah isinya true atau tidak.

3. Hasil testing JUnit

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Latihan Load testing

1. JMeter menggunakan method select
 - a. Method selectAllStudents

tutorial6.jmx (E:\01 MASTER\apache-jmeter-4.0\bin\tutorial6.jmx) - Apache JMeter (4.0 r1823414)

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Sample #	Start Time	Thread Name	Label	Sample Time(s)	Status	Bytes	Send Bytes	Latency	Connect Time(s)
1	23:42:12.348	Thread Group 5-1	HTTP Request	5794	✓	2789437	133	1488	13
2	23:42:12.451	Thread Group 5-2	HTTP Request	3644	✓	2789437	133	2508	1
3	23:42:12.638	Thread Group 5-2	HTTP Request	4863	✓	2789437	133	2621	1
4	23:42:12.897	Thread Group 5-4	HTTP Request	16302	✓	2789437	133	8386	2
5	23:42:13.264	Thread Group 5-6	HTTP Request	17364	✓	2789437	133	10885	47
6	23:42:13.941	Thread Group 5-6	HTTP Request	17831	✓	2789437	133	11653	8
7	23:42:13.449	Thread Group 5-7	HTTP Request	21826	✓	2789437	133	16008	36
8	23:42:13.640	Thread Group 5-8	HTTP Request	22702	✓	2789437	133	20332	70
9	23:42:13.949	Thread Group 5-9	HTTP Request	27465	✓	2789437	133	20132	89
10	23:42:14.048	Thread Group 5-10	HTTP Request	28071	✓	2789437	133	20313	23
11	23:42:14.250	Thread Group 5-11	HTTP Request	29948	✓	2789437	133	27921	4
12	23:42:14.450	Thread Group 5-12	HTTP Request	34543	✓	2789437	133	27989	65
13	23:42:14.650	Thread Group 5-15	HTTP Request	13649	✓	2789437	133	28065	45
14	23:42:14.650	Thread Group 5-13	HTTP Request	34791	✓	2789437	133	27953	11
15	23:42:14.650	Thread Group 5-14	HTTP Request	34604	✓	2789437	133	26229	36
16	23:42:15.449	Thread Group 5-17	HTTP Request	34514	✓	2789437	133	28171	44
17	23:42:15.650	Thread Group 5-18	HTTP Request	34114	✓	2789437	133	33340	105
18	23:42:16.050	Thread Group 5-20	HTTP Request	34070	✓	2789437	133	32844	106
19	23:42:16.250	Thread Group 5-16	HTTP Request	35665	✓	2789437	133	34645	6
20	23:42:16.850	Thread Group 5-19	HTTP Request	35648	✓	2789437	133	34519	5
21	23:42:17.449	Thread Group 5-22	HTTP Request	35662	✓	2789437	133	34464	74
22	23:42:17.449	Thread Group 5-27	HTTP Request	36996	✓	2789437	133	34006	126
23	23:42:20.335	Thread Group 5-41	HTTP Request	36335	✓	2789437	133	31772	51
24	23:42:17.556	Thread Group 5-25	HTTP Request	38819	✓	2789437	133	35610	34
25	23:42:18.241	Thread Group 5-36	HTTP Request	37572	✓	2789437	133	32621	14
26	23:42:20.890	Thread Group 5-44	HTTP Request	38890	✓	2789437	133	31913	46
27	23:42:18.648	Thread Group 5-38	HTTP Request	37078	✓	2789437	133	32705	1
28	23:42:18.849	Thread Group 5-24	HTTP Request	40101	✓	2789437	133	35105	147
29	23:42:18.648	Thread Group 5-23	HTTP Request	40841	✓	2789437	133	40008	7
30	23:42:18.250	Thread Group 5-21	HTTP Request	41342	✓	2789437	133	40428	234
31	23:42:17.549	Thread Group 5-28	HTTP Request	38943	✓	2789437	133	38920	2
32	23:42:18.349	Thread Group 5-30	HTTP Request	39550	✓	2789437	133	38865	6
33	23:42:18.870	Thread Group 5-34	HTTP Request	38754	✓	2789437	133	38880	2
34	23:42:20.270	Thread Group 5-40	HTTP Request	37272	✓	2789437	133	36884	110
35	23:42:21.334	Thread Group 5-45	HTTP Request	36321	✓	2789437	133	35637	51
36	23:42:20.770	Thread Group 5-32	HTTP Request	37789	✓	2789437	133	36715	49
37	23:42:18.671	Thread Group 5-30	HTTP Request	38600	✓	2789437	133	38206	2
38	23:42:20.070	Thread Group 5-35	HTTP Request	35211	✓	2789437	133	32584	1
39	23:42:17.860	Thread Group 5-48	HTTP Request	36720	✓	2789437	133	36579	6
40	23:42:17.250	Thread Group 5-26	HTTP Request	41043	✓	2789437	133	40481	11
41	23:42:21.450	Thread Group 5-42	HTTP Request	36270	✓	2789437	133	36579	12
42	23:42:20.452	Thread Group 5-42	HTTP Request	37886	✓	2789437	133	37605	7
43	23:42:19.976	Thread Group 5-38	HTTP Request	38374	✓	2789437	133	38863	19
44	23:42:19.976	Thread Group 5-40	HTTP Request	37941	✓	2789437	133	36715	51

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- b. Method selectStudent yang benar

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Sample #	Start Time	Thread Name	Label	Sample Time(ms)	Status	Bytes	Sent Bytes	Latency	Connect Time(ms)
1	23:46:03.755	Thread Group 1-1	HTTP Request	26	Success	372	141	20	17
2	23:46:03.845	Thread Group 1-2	HTTP Request	10	Success	372	141	20	1
3	23:46:04.144	Thread Group 1-3	HTTP Request	54	Success	372	141	14	1
4	23:46:04.336	Thread Group 1-4	HTTP Request	17	Success	372	141	17	2
5	23:46:04.532	Thread Group 1-5	HTTP Request	14	Success	372	141	13	2
6	23:46:04.730	Thread Group 1-6	HTTP Request	16	Success	372	141	16	1
7	23:46:04.831	Thread Group 1-7	HTTP Request	5	Success	372	141	8	1
8	23:46:05.131	Thread Group 1-8	HTTP Request	16	Success	372	141	13	2
9	23:46:05.330	Thread Group 1-9	HTTP Request	7	Success	372	141	7	2
10	23:46:05.531	Thread Group 1-10	HTTP Request	7	Success	372	141	7	1
11	23:46:05.731	Thread Group 1-11	HTTP Request	10	Success	372	141	10	1
12	23:46:05.931	Thread Group 1-12	HTTP Request	11	Success	372	141	11	2
13	23:46:06.131	Thread Group 1-13	HTTP Request	8	Success	372	141	8	2
14	23:46:06.330	Thread Group 1-14	HTTP Request	14	Success	372	141	14	2
15	23:46:06.531	Thread Group 1-15	HTTP Request	21	Success	372	141	21	2
16	23:46:06.731	Thread Group 1-16	HTTP Request	10	Success	372	141	14	2
17	23:46:06.931	Thread Group 1-17	HTTP Request	6	Success	372	141	6	1
18	23:46:07.130	Thread Group 1-18	HTTP Request	7	Success	372	141	7	1
19	23:46:07.331	Thread Group 1-19	HTTP Request	8	Success	372	141	8	1
20	23:46:07.531	Thread Group 1-20	HTTP Request	7	Success	372	141	7	1
21	23:46:07.731	Thread Group 1-21	HTTP Request	7	Success	372	141	7	2
22	23:46:07.931	Thread Group 1-22	HTTP Request	12	Success	372	141	14	2
23	23:46:08.132	Thread Group 1-23	HTTP Request	13	Success	372	141	13	2
24	23:46:08.330	Thread Group 1-24	HTTP Request	7	Success	372	141	6	1
25	23:46:08.531	Thread Group 1-25	HTTP Request	9	Success	372	141	8	1
26	23:46:08.731	Thread Group 1-26	HTTP Request	5	Success	372	141	6	1
27	23:46:08.931	Thread Group 1-27	HTTP Request	10	Success	372	141	8	1
28	23:46:09.130	Thread Group 1-28	HTTP Request	5	Success	372	141	5	1
29	23:46:09.330	Thread Group 1-29	HTTP Request	8	Success	372	141	8	1
30	23:46:09.530	Thread Group 1-30	HTTP Request	8	Success	372	141	8	1
31	23:46:09.731	Thread Group 1-31	HTTP Request	10	Success	372	141	10	1
32	23:46:09.930	Thread Group 1-32	HTTP Request	10	Success	372	141	10	1
33	23:46:10.130	Thread Group 1-33	HTTP Request	6	Success	372	141	6	0
34	23:46:10.331	Thread Group 1-34	HTTP Request	10	Success	372	141	10	1
35	23:46:10.531	Thread Group 1-35	HTTP Request	8	Success	372	141	8	1
36	23:46:10.731	Thread Group 1-36	HTTP Request	10	Success	372	141	10	1
37	23:46:10.931	Thread Group 1-37	HTTP Request	11	Success	372	141	11	1
38	23:46:11.130	Thread Group 1-38	HTTP Request	10	Success	372	141	10	1
39	23:46:11.331	Thread Group 1-39	HTTP Request	10	Success	372	141	10	1
40	23:46:11.531	Thread Group 1-40	HTTP Request	10	Success	372	141	10	1
41	23:46:11.730	Thread Group 1-41	HTTP Request	10	Success	372	141	10	1
42	23:46:11.931	Thread Group 1-42	HTTP Request	10	Success	372	141	10	1
43	23:46:12.131	Thread Group 1-43	HTTP Request	10	Success	372	141	10	1
44	23:46:12.331	Thread Group 1-44	HTTP Request	7	Success	372	141	7	1

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c. Method selectStudent yang salah

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Sample #	Start Time	Thread Name	Label	Sample Time(ms)	Status	Bytes	Sent Bytes	Latency	Connect Time(ms)
1	23:47:03.488	Thread Group 1-1	HTTP Request	19	Success	337	136	19	10
2	23:47:03.684	Thread Group 1-2	HTTP Request	7	Success	337	136	7	1
3	23:47:03.888	Thread Group 1-3	HTTP Request	6	Success	337	136	6	1
4	23:47:04.092	Thread Group 1-4	HTTP Request	820	Success	337	136	820	2
5	23:47:04.289	Thread Group 1-5	HTTP Request	331	Success	337	136	331	2
6	23:47:04.483	Thread Group 1-6	HTTP Request	127	Success	337	136	127	2
7	23:47:04.688	Thread Group 1-7	HTTP Request	6	Success	337	136	6	1
8	23:47:04.887	Thread Group 1-8	HTTP Request	10	Success	337	136	9	2
9	23:47:05.088	Thread Group 1-9	HTTP Request	14	Success	337	136	14	1
10	23:47:05.287	Thread Group 1-10	HTTP Request	10	Success	337	136	10	2
11	23:47:05.487	Thread Group 1-11	HTTP Request	6	Success	337	136	6	1
12	23:47:05.688	Thread Group 1-12	HTTP Request	10	Success	337	136	10	2
13	23:47:05.887	Thread Group 1-13	HTTP Request	347	Success	337	136	347	2
14	23:47:06.088	Thread Group 1-14	HTTP Request	148	Success	337	136	148	2
15	23:47:06.287	Thread Group 1-15	HTTP Request	6	Success	337	136	6	1
16	23:47:06.488	Thread Group 1-16	HTTP Request	6	Success	337	136	6	1
17	23:47:06.688	Thread Group 1-17	HTTP Request	76	Success	337	136	76	3
18	23:47:06.887	Thread Group 1-18	HTTP Request	6	Success	337	136	6	1
19	23:47:07.088	Thread Group 1-19	HTTP Request	7	Success	337	136	7	1
20	23:47:07.288	Thread Group 1-20	HTTP Request	7	Success	337	136	7	1
21	23:47:07.488	Thread Group 1-21	HTTP Request	8	Success	337	136	8	2
22	23:47:07.688	Thread Group 1-22	HTTP Request	13	Success	337	136	13	2
23	23:47:07.887	Thread Group 1-23	HTTP Request	6	Success	337	136	6	1
24	23:47:08.087	Thread Group 1-24	HTTP Request	6	Success	337	136	6	1
25	23:47:08.288	Thread Group 1-25	HTTP Request	6	Success	337	136	6	1
26	23:47:08.488	Thread Group 1-26	HTTP Request	9	Success	337	136	9	2
27	23:47:08.688	Thread Group 1-27	HTTP Request	10	Success	337	136	14	2
28	23:47:08.888	Thread Group 1-28	HTTP Request	6	Success	337	136	6	2
29	23:47:09.088	Thread Group 1-29	HTTP Request	6	Success	337	136	6	2
30	23:47:09.288	Thread Group 1-30	HTTP Request	6	Success	337	136	6	1
31	23:47:09.488	Thread Group 1-31	HTTP Request	6	Success	337	136	6	1
32	23:47:09.687	Thread Group 1-32	HTTP Request	7	Success	337	136	7	2
33	23:47:09.888	Thread Group 1-33	HTTP Request	14	Success	337	136	14	2
34	23:47:10.088	Thread Group 1-34	HTTP Request	6	Success	337	136	6	2
35	23:47:10.287	Thread Group 1-35	HTTP Request	7	Success	337	136	7	2
36	23:47:10.487	Thread Group 1-36	HTTP Request	6	Success	337	136	6	1
37	23:47:10.687	Thread Group 1-37	HTTP Request	13	Success	337	136	13	2
38	23:47:10.887	Thread Group 1-38	HTTP Request	6	Success	337	136	6	1
39	23:47:11.088	Thread Group 1-39	HTTP Request	6	Success	337	136	6	1
40	23:47:11.287	Thread Group 1-40	HTTP Request	6	Success	337	136	6	1
41	23:47:11.487	Thread Group 1-41	HTTP Request	6	Success	337	136	6	1
42	23:47:11.688	Thread Group 1-42	HTTP Request	6	Success	337	136	6	1
43	23:47:11.888	Thread Group 1-43	HTTP Request	13	Success	337	136	13	2
44	23:47:12.088	Thread Group 1-44	HTTP Request	7	Success	337	136	7	1

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