Mutation testing: part 1

Storeservice:

We chose the storeservice class since all the other critical classes had a mutation score above 70%. There were some classes that a mutation score belowe 70%, but most of them were classes that were given in the template. After discussing with our TA, we decided to only augment the test suites of the classes we implemented.

Upon inspection, we saw that some critical mutations, such as checking if the store was actually saved in the database, returning the correct error messages… were not killed in the StoreService class. The StoreService is furthermore a very important part of the application. So that is why we decided to augment this test suite.

Link to commit: https://gitlab.ewi.tudelft.nl/cse2115/2022-2023/SEM07b/-/commit/5f1740c16af1e62749718c2bd32f1eec130e7990

Pit Test Coverage Report

Package Summary

pizzeria.order.domain.store

Number of Classes	Line Coverage		Mutation Coverage	
2	100%	63/63	79%	23/29

Breakdown by Class

Name	Line Coverage		Mutation Coverage	
Store.java	100%	16/16	86%	6/7
StoreService.java	100%	47/47	77%	17/22

Report generated by PIT 1.5.1

Fig. 1: mutation testing score before augmenting the test suite of the StoreService class

Pit Test Coverage Report

Package Summary

pizzeria.order.domain.store

Number of Classes	Line Coverage		Mutation Coverage		Test Strength	
2	100%	63/63	97%	28/29	97%	28/29

Breakdown by Class

Name	Line Coverage		Mutation Coverage		Test Strength	
Store.java	100%	16/16	86%	6/7	86%	6/7
StoreService.java	100%	47/47	100%	22/22	100%	22/22

Report generated by PIT 1.7.0

Fig. 2: mutation score after augmenting the test suite of the StoreService class

MailingService:

Pit Test Coverage Report

Package Summary

pizzeria.order.domain.mailing

Number of Classes	Line Coverage	Mutation Coverage	Test Strength
2	91% 32/35	8% 1/13	9% 1/11

Breakdown by Class

Name	Line Coverage		Mutation Coverage		Test Strength	
MailingService.java	97%	31/32	8%	1/12	9%	1/11
MessageTransport.java	33%	1/3	0%	0/1	0%	0/0

Fig. 3: mutation score before augmenting the test suite of the MailingService class

Pit Test Coverage Report

Package Summary

pizzeria.order.domain.mailing

Number of Classes	Line Coverage	Mutation Coverage	Test Strength
2	89% 33/37	75% 6/8	100% 6/6

Breakdown by Class

Name	Line Coverage		Mutation Coverage		Test Strength	
MailingService.java	94%	32/34	86%	6/7	100%	6/6
MessageTransport.java	33%	1/3	0%	0/1	0%	0/0

Fig. 4: mutation score after augmenting the test suite of the MailingService class

RegistrationService:

Link to commit: https://gitlab.ewi.tudelft.nl/cse2115/2022-2023/SEM07b/-/commit/5d3c15bb0d0b91683c946d829d736ae20da6197b

Pit Test Coverage Report

Package Summary

pizzeria.authentication.domain.user

Number of Classes	Line Coverage		Mutation Coverage		Test Strength	
8	100%	64/64	75%	21/28	75%	21/28

Breakdown by Class

Name	Line Coverage		Mutation Coverage		Test Strength	
AppUser.java	100%	23/23	86%	12/14	86%	12/14
HashedPassword.java	100%	5/5	0%	0/1	0%	0/1
HashedPasswordAttributeConverter.java	100%	3/3	100%	2/2	100%	2/2
Password.java	100%	5/5	0%	0/1	0%	0/1
PasswordHashingService.java	100%	4/4	100%	1/1	100%	1/1
PasswordWasChangedEvent.java	100%	4/4	100%	1/1	100%	1/1
RegistrationService.java	100%	16/16	57%	4/7	57%	4/7

Fig. 5: mutation score before augmenting the test suite of the RegistrationService class

Pit Test Coverage Report

Package Summary

pizzeria.authentication.domain.user

Number of Classes	Line Coverage		Mutation Coverage		Test Strength	
8	100%	64/64	86%	24/28	86%	24/28

Breakdown by Class

Name	Line Coverage		Mutation Coverage		Test Strength	
AppUser.java	100%	23/23	86%	12/14	86%	12/14
HashedPassword.java	100%	5/5	0%	0/1	0%	0/1
HashedPasswordAttributeConverter.java	100%	3/3	100%	2/2	100%	2/2
Password.java	100%	5/5	100%	1/1	100%	1/1
PasswordHashingService.java	100%	4/4	100%	1/1	100%	1/1
PasswordWasChangedEvent.java	100%	4/4	100%	1/1	100%	1/1
RegistrationService.java	100%	16/16	100%	7/7	100%	7/7

Fig. 6: mutation score after augmenting the test suite of the RegistrationService class

HttpRequestService

Link to commit - https://gitlab.ewi.tudelft.nl/cse2115/2022-2023/SEM07b/-/commit/5a74d3bf1f482454738e80c6f4b5420d205cb950

Pit Test Coverage Report

Package Summary

pizzeria.user.communication

Number of Classes	Line Coverage		Mutation Coverage		Test Strength	
1	100%	29/29	50%	4/8	50%	4/8

Breakdown by Class

Name	Line Coverage		Mutation Coverage		Test Strength	
HttpRequestService.java	100%	29/29	50%	4/8	50%	4/8

Report generated by PIT 1.9.5

Fig. 7: mutation score before augmenting the test suite of the HttpRequestService class

Pit Test Coverage Report

Package Summary

pizzeria.user.communication

Number of Classes	Line Coverage		Mutation Coverage	
1	100%	29/29	100%	8/8

Breakdown by Class

Name	Line Coverage		Mutation Coverage	
HttpRequestService.java	100%	29/29	100%	8/8

Report generated by PIT 1.5.1

Fig. 8: mutation score after augmenting the test suite of the HttpRequestService class