Equivalence Partition and Boundary Testing

**User.java**

**refreshRecentlyPlayed()**

Equivalence classes:

1. Api return less then 10 items
2. Api return 10 items
3. Api return more than 10 items
4. Null track object
5. Non null track object
6. Null artist object
7. Non null artist object
8. Null track name
9. Empty track name
10. Not empty track name

* [Invalid][1] testResfreshRecentlyPlayedLessThan10()
  + Boundary Condition: just below 10 (9 items tested)
  + Boundary Condition: just above 0 (length 1 tested)
* [Valid][2, 5, 7, 10] testResfreshRecentlyPlayed()
  + Boundary Condition: = 10
* [Invalid][3] testResfreshRecentlyPlayedMoreThan10()
  + Boundary Condition: just above 10 (11 items tested)
* [Invalid][4] testResfreshRecentlyPlayedNullTrack()
* [Invalid][6] testResfreshRecentlyPlayedNullArtist()
* [Invalid][8] testResfreshRecentlyPlayedNullTrackName()
* [Invalid][9] testResfreshRecentlyPlayedEmptyTrackName()

**refreshCurrentlyPlaying()**

Equivalence classes:

1. Null CurrentlyPlaying object
2. Non Null CurrentlyPlaying object
3. Null track object
4. Non null track object
5. Null artist object
6. Non null artist object
7. Null track name
8. Empty track name
9. Not empty track name

* [Valid][1] testRefreshCurrentlyPlayingNull()
* [Valid][2, 4, 6, 9] testRefreshCurrentlyPlayingNotNull()
  + Boundary Condition: track name length just above 0 (length 1 tested)
* [Invalid][3] testResfreshCurrentlyPlayingNullTrack()
* [Invalid][5] testResfreshCurrentlyPlayingNullArtist
* [Invalid][7] testResfreshCurrentlyPlayingNullTrackName()
* [Invalid][8] testResfreshCurrentlyPlayingEmptyTrackName()
  + Boundary Condition: track name length at 0 (length 0 tested)

**addToQueue()**

Equivalence classes:

1. Uri length > 14
2. Uri length <= 14
3. Uri contains "spotify:track:”
4. Uri does not contain "spotify:track:”

* [Valid][1][3] testAddToQueueValidUri()
  + Boundary Condition: just above 14 (length: 15)
* [Invalid][2] Test: testAddToQueueShortUri()
  + Boundary Condition: at 14
* [Invalid][1, 4] testAddToQueueLongInvalidUri()
  + Boundary Condition: just above 14 (length: 15)
* [Invalid][2, 4] testAddToQueueShortInvalidUri()
  + Boundary Condition: at 14

**Share()**

Equivalence class:

1. Non null chatlist
2. Null chatlist
3. Null current track
4. Non null current track
5. Null genre string
6. Non null genre string

* [Valid][1, 4, 6] shareTestOK()
* [Invalid][2] shareTestNullChatlist()
* [Invalid][3] shareTestNullCurrentTrack()
* [Invalid][5] shareTestNullGenreStr()

**refreshSpotifyToken()**

Equivalence classes:

1. Token length > 0
2. Empty token
3. Null Token

* [Valid][1] testRefreshSpotifyTokenValid()
  + Boundary Condition: just above 0 (tested length = 1)
* [Invalid][2] testRefreshSpotifyTokenEmptyToken()
  + Boundary Condition: at 0
* [Invalid][3] testRefreshSpotifyTokenNullToken()

**SqLite.java**

The functions in this file interacts with String and Genre object input.

To set equivalence partition for String input, we tested: 1) null string, 2) empty string and 3) string with length > 0.

Boundary conditions for String input are 1) length == 0, and 2) length > 0

And to test Genre object, we tested: 1) null object, 2) not null object. No boundary condition for genre objects

Method:

**InsertAuthenticatedUser()**

Equivalence class:

1. Not empty username
2. Null Username
3. Empty Username
4. Not empty token
5. Null Token
6. Empty Token
7. Not empty refresh token
8. Null Refresh Token
9. Empty Refresh Token
10. Not empty session id
11. Null Session Id
12. Empty SessionId

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4, 7, 10] testInsertAuthenticatedUserOK()
  + Boundary Condition: length == 1 for all
* [Invalid][2] testInsertAuthenticatedUserNullUsername()
* [Invalid][3] testInsertAuthenticatedUserEmptyUsername()
  + Boundary Condition: length == 0
* [Invalid][5] testInsertAuthenticatedUserNullToken()
* [Invalid][7] testInsertAuthenticatedUserEmptyToken()
  + Boundary Condition: length == 0
* [Invalid][8] testInsertAuthenticatedUserNullRefreshToken()
* [Invalid][9] testInsertAuthenticatedUserEmptyToken()
  + Boundary Condition: length == 0
* [Invalid][11] testInsertAuthenticatedUserNullSessionId()
* [Invalid][12] testInsertAuthenticatedUserEmptySessionId()
  + Boundary Condition: length == 0

**UpdateUserAttribute()**

Equivalence class:

1. Not empty attribute
2. Null Attribute
3. Empty Attribute
4. Not empty value
5. Null Value
6. Empty Value
7. Not empty username
8. Null Username
9. Empty Username

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4, 7] testUpdateUserAttributeOK()
  + Boundary Condition: length == 1 for all
* [Invalid][2] testUpdateUserAttributeNullAttribute()
* [Invalid][3] testUpdateUserAttributeEmptyAttribute()
  + Boundary Condition: length == 0
* [Invalid][5] testUpdateUserAttributeNullValue()
* [Invalid][6] testUpdateUserAttributeEmptyValue()
  + Boundary Condition: length == 0
* [Invalid][8] testUpdateUserAttributeNullUsername()
* [Invalid][9] testUpdateUserAttributeEmptyUsername()
  + Boundary Condition: length == 0

**InsertUserwithGenre()**

Equivalence class:

1. Not empty Username
2. Null Username
3. Empty Username
4. Not empty Genre
5. Null Genre
6. Empty Genre

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4] testInsertUserwithGenreOK()
  + Boundary Condition: length == 1 for Username and Genre
* [Invalid][2] testInsertUserwithGenreNullUsername()
* [Invalid][3] testInsertUserwithGenreEmptyUsername()
  + Boundary Condition: length == 0
* [Invalid][5] testInsertUserwithGenreNullGenre()
* [Invalid][6] testInsertUserwithGenreEmptyGenre()
  + Boundary Condition: length == 0

**GetUserByName()**

Equivalence class:

1. Not empty Username
2. Null Username
3. Empty Username

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1] testGetUserByNameOK()
  + Boundary Condition: length == 1 for Username
* [Invalid][2] testGetUserByNameNullUsername()
* [Invalid][3] testGetUserByNameEmptyUsername()
  + Boundary Condition: length == 0

**AuthenticateUser()**

Equivalence class:

1. Not null and not empty code
2. Null code
3. Empty code
4. Not empty session id
5. Null session id
6. Empty session id

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4] testAuthenticateUserOld()
  + Boundary Condition: length == 1 for code and session id
* [Valid][1, 4] testAuthenticateUserNew()
  + Boundary Condition: length == 1 for code and session if
* [Invalid][2] testAuthenticateUserNullCode()
* [Invalid][3] testAuthenticateUserEmptyCode()
  + Boundary Condition: code length == 0
* [Invalid][5] testAuthenticateUserNullSessionId()
* [Invalid][6] testAuthenticateUserEmptySessionId()
  + Boundary Condition: session id length == 0

**GetUserCount()**

Equivalence class:

1. Not empty for username
2. Null username
3. Empty username

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1] testGetUserCountOK()
  + Boundary Condition: username length == 1
* [Invalid][2] testGetUserCountNullUsername()
* [Invalid][3] testGetUserCountEmptyUsername()
  + Boundary Condition: username length == 0

**GetGenreUser()**

Equivalence class:

1. Not empty username
2. Null username
3. Empty username

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1] testGetGenreUserOK()
  + Boundary Condition: username length == 1
* [Invalid][2] testGetGenreUserNullUsername()
* [Invalid][3] testGetGenreUserEmptyUsername()
  + Boundary Condition: username length == 0

**GetUserBySessionId**

Equivalence class:

1. Not empty for session id
2. Null session id
3. Empty session id

Boundary conditions for String input are 1) length == 0, and 2) length > 0

* [Valid][1] testGetUserBySessionIdOK()
  + Boundary Condition: username length == 1
* [Invalid][2] testGetUserBySessionIdNullSessionId()
* [Invalid][3] testGetUserBySessionIdEmptySessionId()
  + Boundary Condition: username length == 0

**InsertChatRoom**

Equivalence class:

1. Non null Genre
2. Null Genre
3. Not empty link
4. Null Link
5. Empty Link
6. Not empty playlist
7. Null Playlist
8. Empty Playlist

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 3, 6] testInsertChatRoomOK()
  + Boundary Condition: length == 1 for all
* [Invalid][2] testInsertChatRoomNullGenre()
* [Invalid][4] testInsertChatRoomNullLink()
* [Invalid][5] testInsertChatRoomEmptyLink()
  + Boundary Condition: link length == 0
* [Invalid][7] testInsertChatRoomNullPlaylist()
* [Invalid][8] testInsertChatRoomEmptyPlaylist()
  + Boundary Condition: playlist length == 0

**InsertParticipant()**

Equivalence class:

1. Not null genre
2. Null Genre
3. Not empty username
4. Null Username
5. Empty Username
6. Not empty token
7. Null Token
8. Empty Token
9. Not empty refresh token
10. Null Refresh Token
11. Empty Refresh Token
12. Not empty session id
13. Null Session Id
14. Empty SessionId

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 3, 6, 9, 12] testInsertParticipantOK()
  + Boundary Condition: length == 1 for all string
* [Invalid][2] testInsertParticipantNullGenre()
* [Invalid][4] testInsertParticipantNullUsername()
* [Invalid][5] testInsertParticipantEmptyUsername()
  + Boundary Condition: username length == 0
* [Invalid][7] testInsertParticipantNullToken()
* [Invalid][8] testInsertParticipantEmptyToken()
  + Boundary Condition: token length == 0
* [Invalid][10] testInsertParticipantNullRefreshToken()
* [Invalid][11] testInsertParticipantEmptyRefreshToken()
  + Boundary Condition: refresh token length == 0
* [Invalid][13] testInsertParticipantNullSessionId()
* [Invalid][14] testInsertParticipantEmptySessionId()
  + Boundary Condition: session id length == 0

**RemoveParticipant()**

Equivalence class:

1. Not null genre
2. Null Genre
3. Not empty username
4. Null Username
5. Empty Username

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 3] testRemoveParticipantOK()
  + Boundary Condition: length == 1 for username
* [Invalid][2] testRemoveParticipantNullGenre()
* [Invalid][4] testRemoveParticipantNullUsername()
* [Invalid][5] testRemoveParticipantEmptyUsername()
  + Boundary Condition: username length == 0

**RemoveUserGenre()**

Equivalence class:

1. Not empty for username
2. Null Username
3. Empty Username

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1] testRemoveUserGenreOK()
  + Boundary Condition: username length == 1
* [Invalid][2] testRemoveUserGenreNullUsername()
* [Invalid][3] testRemoveUserGenreEmptyUsername()
  + Boundary Condition: username length == 0

**GetChatRoomParticipant()**

Equivalence class:

1. Not null for Genre object
2. Null Genre

* [Valid][1] testGetChatRoomParticipantOK()
* [Invalid][2] testGetChatRoomParticipantNullGenre()

**InsertSong()**

Equivalence class:

1. Not empty username
2. Null Username
3. Empty Username
4. Non null time shared
5. Null Time Shared
6. Non null genre
7. Null Genre
8. Not empty song
9. Null song
10. Empty song

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4, 6, 8] testInsertSongOK()
  + Boundary Condition: username and song length == 1
* [Invalid][2] testInsertSongNullUsername()
* [Invalid][3] testInsertSongEmptyUsername()
  + Boundary Condition: username length == 0
* [Invalid][5] testInsertSongNullTimeShared()
* [Invalid][7] testInsertSongNullGenre()
* [Invalid][9] testInsertSongNullSong()
* [Invalid][10] testInsertSongEmptySong()
  + Boundary Condition: song length == 0

**GetChatRoomPlaylist()**

Equivalence class:

1. Not null Genre object
2. Null Genre

* [Valid][1] testGetChatRoomPlaylistOK()
* [Invalid][2] testGetChatRoomPlaylistNullGenre()

**InsertSession()**

Equivalence class:

1. Not empty time
2. Null time
3. Empty time
4. Not empty session id
5. Null session id
6. Empty session id

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4] testInsertSessionOK()
  + Boundary Condition: time and session id length == 1
* [Invalid][2] testInsertSessionNullTime()
* [Invalid][3] testInsertSessionEmptyTime()
  + Boundary Condition: time length == 0
* [Invalid][5] testInsertSessionNullSessionId()
* [Invalid][6] testInsertSessionEmptySessionId()
  + Boundary Condition: session id length == 0

**UserJoin()**

Equivalence classes:

1. Non null genre
2. Null genre
3. Not empty username
4. Null username
5. Empty username
6. Not null chatlist
7. Null chatlist

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 3, 6] testUserJoinOldOK()
  + Boundary Condition: username length == 1
* [Invalid][2] testUserJoinNullGenre()
* [Invalid][4] testUserJoinNullUsername()
* [Invalid][5] testUserJoinEmptyUsername()
  + Boundary Condition: username length == 0
* [Invalid][7] testUserJoinNullChatlist()

**UserSend()**

Equivalence classes:

1. Not empty username
2. Null username
3. Empty username
4. Not empty text
5. Null text
6. Empty text
7. Not null chatlist
8. Null chatlist

Boundary conditions:

String input are 1) length == 0, and 2) length > 0

* [Valid][1, 4, 7] testUserSendOK()
  + Boundary Condition: username and text length == 1
* [Invalid][2] testUserSendNullUsername()
* [Invalid][3] testUserSendEmptyUsername()
  + Boundary Condition: username length == 0
* [Invalid][5] testUserSendNullText()
* [Invalid][6] testUserSendEmptyText()
  + Boundary Condition: text length == 0
* [Invalid][8] testUserSendNullChatlist()

**Connect()**

Equvalence classes:

1. Null connection
2. Non null connection

* [Valid][1] testConnectOK()
* [Invalid][2] testConnectExists()

**GetAllChatrooms()**

Equvialence classes:

1. Non null statement
2. Null statement

* [Valid][1] testGetAllChatRoomsOK()
* [Invalid][2] testGetAllChatRoomsNullStmt

**GetLatestSession()**

Equvalence classes:

1. Non null statement
2. Null statement

* [Valid][1] testGetLatestSession()
* [Invalid][2] testGetLatestSessionNullStmt

[skip] Update()

* Method simply calls getAllChatRooms() that is equivalence partition tested.

**ChatRoom.java**

**AddParticipant()**

Equivalence class:

1. not null User object
2. Null User object
3. Not empty username
4. User with null username
5. User with empty username

Boundary condition: username length == 0 and username length > 0

* [Valid][1, 3] addParticipantTestOK()
  + Boundary Condition: username length == 1
* [Invalid][2] addParticipantTestNullUser()
* [Invalid][4] addParticipantTestNullUsername()
* [Invalid][5] addParticipantTestEmptyUsername()
  + Boundary Condition: username length == 0

**AddMessage()**

Equivalence classes:

1. not null Message object
2. Null Message object
3. Message with not empty content
4. Message with null content
5. Message with empty content

Boundary condition: message content length == 0 and message content length > 0

* [Valid][1, 3] addMessageTestOK()
  + Boundary Condition: message content length == 1
* [Invalid][2] addMessageTestNullMessage()
* [Invalid][4] addMessageTestNullMessageContent()
* [Invalid][5] addMessageTestEmptyMessageContent()
  + Boundary Condition: message content length == 0

**AddSong()**

Equivalence class:

1. not null Song object
2. Null song object
3. Song with not empty song name
4. Song with null song name
5. Song with empty song name

Boundary condition: song name length == 0 and song name length > 0

* [Valid][1, 3] addSongTestOK()
  + Boundary Condition: song name length == 1
* [Invalid][2] addSongTestNullSong()
* [Invalid][4] addSongTestNullSongName()
* [Invalid][5] addSongTestEmptySongName()
  + Boundary Condition: song name length == 0

**Genre.java**

**IsValidGenre()**

Equivalence classes:

1. not empty genre string
2. null genre string
3. empty genre string

Boundary condition: genre string length < 3 and genre string length >= 3

* [Valid][1] isValidGenreTrueTest()
  + Boundary condition: Test at length == 3
* [Invalid][2] isValidGenreFalseTest()
  + Boundary condition: Test at length == 2
* [Invalid][3] isValidGenreNullTest()

**MyApi.java**

**RecentlyPlayed()**

Equivalence class:

1. Api object is not null
2. Api object is null

* [Valid][1] recentlyPlayedTestOK()
* [Invalid][2] recentlyPlayedTestNullApi()

**CurrentlyPlaying()**

Equivalence class:

1. Api object is not null
2. Api object is null

* [Valid][1] currentlyPlayingTestOK()
* [Invalid][2] currentlyPlayingTestNullApi()

**AddSong()**

Equivalence class:

1. Api object is not null
2. Api object is null

* [Valid][1] addSongTestOK()
* [Invalid][2] addSongTestNullApi()

**GetSpotifyTokenFromCode()**

Equivalence classes:

1. Non null code
2. null code
3. empty code

Boundary Condition: code length == 0, code length > 0

* [Valid][1] getSpotifyTokenFromCodeTestOK()
  + Boundary Condition: code length at 1
* [Invalid][2] getSpotifyTokenFromCodeNullCode()
* [Invalid][3] getSpotifyTokenFromCodeEmptyCode()
  + Boundary Condition: code length == 0

**RefreshSpotifyToken()**

Equivalence classes:

1. Non null token
2. null token
3. empty token

Boundary Condition: token length == 0, token length > 0

* [Valid][1] refreshSpotifyTokenTestOK ()
  + Boundary Condition: token length > 0
* [Invalid][2] refreshSpotifyTokenTestNullToken()
* [Invalid][3] refreshSpotifyTokenTestEmptyToken()
  + Boundary Condition: token length == 0

**GetEmailFromSpotifyToken()**

Equivalence classes:

1. Non null token
2. null token
3. Empty token

Boundary Condition: token length == 0, token length > 0

* [Valid][1] getEmailFromSpotifyTokenTestOK ()
  + Boundary Condition: token length > 0
* [Invalid][2] getEmailFromSpotifyTokenTestNullToken()
* [Invalid][3] getEmailFromSpotifyTokenTestEmptyToken()
  + Boundary Condition: token length == 0

[skip] BuildFormDataFromMap

* Private helper method

**ChatList.java**

**GetChatroomByGenreTest()**

Equivalence classes:

1. Not null genre object
2. null genre object

* [Valid][1] getChatroomByGenreTestOK()
* [Invalid][2] getChatroomByGenreTestNullGenre()

**GetTotalParticipants()**

Equivalence classes:

1. Not null chatroom list
2. null chatroom list

* [Valid][1] getTotalParticipantsTest()
* [Invalid][2] getTotalParticipantsTestNullChatroomList()

**RefreshChatList()**

Equivalence classes:

1. not null chatroom list
2. chatlist with null chatroom list
3. not null chatrooms
4. chatlist with null chatrooms

* [Valid][1, 3] refreshChatListTestWithToken()
* [Valid][1, 3] refreshChatListTestWithoutToken()
* [Invalid][2] refreshChatListTestNullChatroomList()
* [Invalid][4] refreshChatListTestNullChatroom()

**StartChat.java**

[skip] InitializeChatList()

* Minor method that calls other db methods to initialize chatlist

[skip] RefreshSongDataRepeatly()

* Private method that calls thread in Thread.java which is tested

/auth endpoint

Equivalence classes:

1. SessionId in database
2. SessionId not in database

* [Valid][1] authTest()
* [Invalid][2] authTestNoSessionId()

/process\_auth

Equivalence classes:

1. Path contains code
2. Path does not contain code
3. SessionId in database
4. SessionId not in database

* [Valid][1, 3] processAuthTest()
* [Invalid][2] processAuthTestNoCode()
* [Invalid][4] processAuthTestNoSessionId()

[skip] /

* Endpoint handle redirection

[skip] /home

* Endpoint handle redirection

[skip] /lobby

* Endpoint handle redirection

[skip] /chatrooms

* Endpoint simply calls getAllChatRooms() that is equivalence partition tested.

**/joinroom/:genre**

Equivalence classes:

1. Valid Genre object
2. Invalid Genre object

* [Valid][1] joinroomTest()
* [Invalid][2] InvalidJoinroomTest()

**/chatroom/:genre**

Equivalence classes:

1. Valid genre type
2. Invalid genre type

* [Valid][1] validChatroomGenreTest()
* [Invalid][2] invalidChatroomGenreTest()

**/send**

Equivalence class:

1. User’s genre matches room genre
2. User’s genre does not match room genre

* [Valid][1] sendMessageTest
* [Invalid][2] sendMessageInvalidTest

**/add**

Equivalence classes:

1. Non null song uri
2. Null song uri

* [Valid][1] addSongTest()
* [Invalid][2] addSongTestNoSong()

**/share**

Equivalence classes:

1. User current track is null
2. User current track is not null
3. [Invalid][1] shareSongNullTest()
4. [Valid][2] shareSongNotNullTest()

**/leaveroom/:genre**

Equivalence classes:

1. User’s genre matches room genre
2. User’s genre does not match room genre
3. [Valid][1] lasttoleaveRoomTest()
4. [Invalid][2] InvalidLeaveRoomTest()

**Thread.java**

Run()

Equivalence classes:

1. Not null database
2. Null database

* [Valid][1] runTestOK()
* [Invalid][2] runTestNullDb()