

Software Engineering HomeWork 5:

Aufg1: Improvements of Code Review

- In the 1st Point: Politeness and constructive/don't show off (- e.g.: l. 5 "Basic Programming 101 knowledge ;)")
- In the 2nd point: Try running the code (-e.g.: l.6 "**seem** inefficient" -> not tested and 4th point)
- In the 3rd point: Do get an understanding about the code's context (- e.g.: l.8 "it's not clear -> was the Context really looked at?)
- In the 4th point: again, testing and context of code
- In Final Comment: Don't discuss style if there are no guidelines (unclear whether there are guidelines, but does not seem to be the case)
- Do highlight the good parts (unclear whether there are good parts, but likely the case), only in 5th point ("...which is good,...")

Aufg2: Black-Box Testing

Test Cases	TC1	TC2	TC3	TC4	TC5	TC6	TC7	TC8	TC9
totalStud > 0	X	X		X	X	X	X	X	
totalStud ≤ 0			X						X
groupSize > 0	X	X	X		X			X	
groupSize ≤ 0				X		X	X		X
availableGroups > 0	X	X	X			X	X		
availableGroups ≤ 0				X	X			X	X
Output = 0			X						
Output > 0	X	X			X	X			
Output exception				X			X	X	X
Input totalStud	100	Max Int	0	100	Max Int	100	100	100	0
Input groupSize	20	5	20	-10	20	0	-20	20	-10
Input availableGroups	5	1	10	-4	0	5	5	-4	-5
Expected Output	0	Max-(5*1)	0	Exception	Max Int	100	Exception	Exception	Exception
Result									

Aufgabe 3: White Box Testing

Zeilen:

```

1  List<Student> assignedStudents = new ArrayList<>();

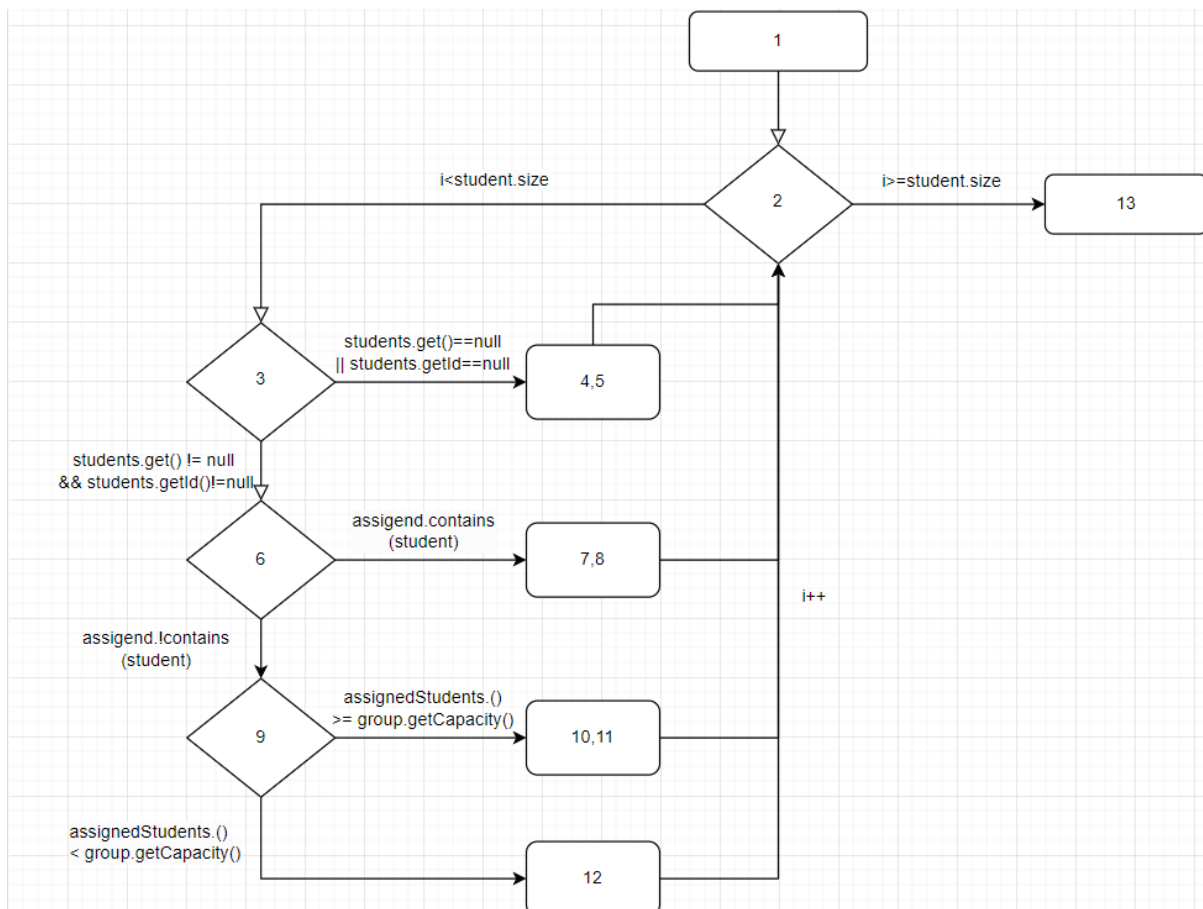
2  for(int i = 0; i < students.size(); i++) {
3      if(students.get(i) == null
4          || student.get(i).getID() == null) {
5          System.out.println("Invalid student or student ID");
6          continue;
7      }
8      if(assignedStudents.contains(student)) {
9          System.out.println("Student already assigned");
10         continue;
11     }
12     if(assignedStudents.size() >= group.getCapacity()) {
13         System.out.println("Group is full");
14         continue;
15     }

16     // All checks passed, add student to group
17     assignedStudents.add(student);
18 }

19 return assignedStudents;
20 }

```

Control Flow Graph:



Coverage:

TestInvalidStudentID:

Statement Coverage: $6/13 = 0,4615 \Rightarrow 46,15\%$

Branch Coverage: $1/8 = 0,125 \Rightarrow 12,5\%$

Condition Coverage: $1/10 = 0,10 \Rightarrow 10\%$

Path Coverage: $1/5 = 0,2 \Rightarrow 20\%$

TestSuccessfulAssignment:

Statement Coverage: $7/13 = 0,5385 \Rightarrow 53,85\%$

Branch Coverage: $4/8 = 0,5 \Rightarrow 50\%$

Condition Coverage: $4/10 = 0,40 \Rightarrow 40\%$

Path Coverage: $1/5 = 0,20 \Rightarrow 20\%$

Overall:

Statement Coverage: $11/13 = 84,6\%$

Branch Coverage: $5/8 = 62,5\%$

Condition Coverage: $5/10 = 50\%$

Path Coverage: $2/5 = 40\%$