

**Gebze Technical University  
Computer Engineering**

**CSE 222 - 2019 Spring**

**HOMEWORK 3 REPORT**

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Course Assistant:

# 1 INTRODUCTION

## 1.1 Problem Definition

**Part1** : Problem is calculate the White components of given  $m \times n$  matrix. In the matrix, 0 means Black and 1 means White. If there is 1 of the up, down, right and left around an element, it means this element is a group. This homework we were have to calculate this group. Also, we were have to read input like file on command line argument path. Result printed on the screen.

**Part2** : This part, we were have to calculate an infix expression. We were have to read this expression and variables from file. This file contain variables (more than one ) and space, after space, there is an expression. Also, there are functions ( sin, cos, abs). We were have to calculate this infix expression and print it on the screen.

## 1.2 System Requirements

**Part1** : This program run on IntelliJ IDE. I mean, Project file will be IntelliJ file. So, for run this program there must be IntelliJ IDE. So, you can just run this program on computer or laptop. Also you have enter a text file path via command line (it must be full path from root). This file should have contain 0s and 1s with space between them. There shouldnt be anything except 0s and 1s.

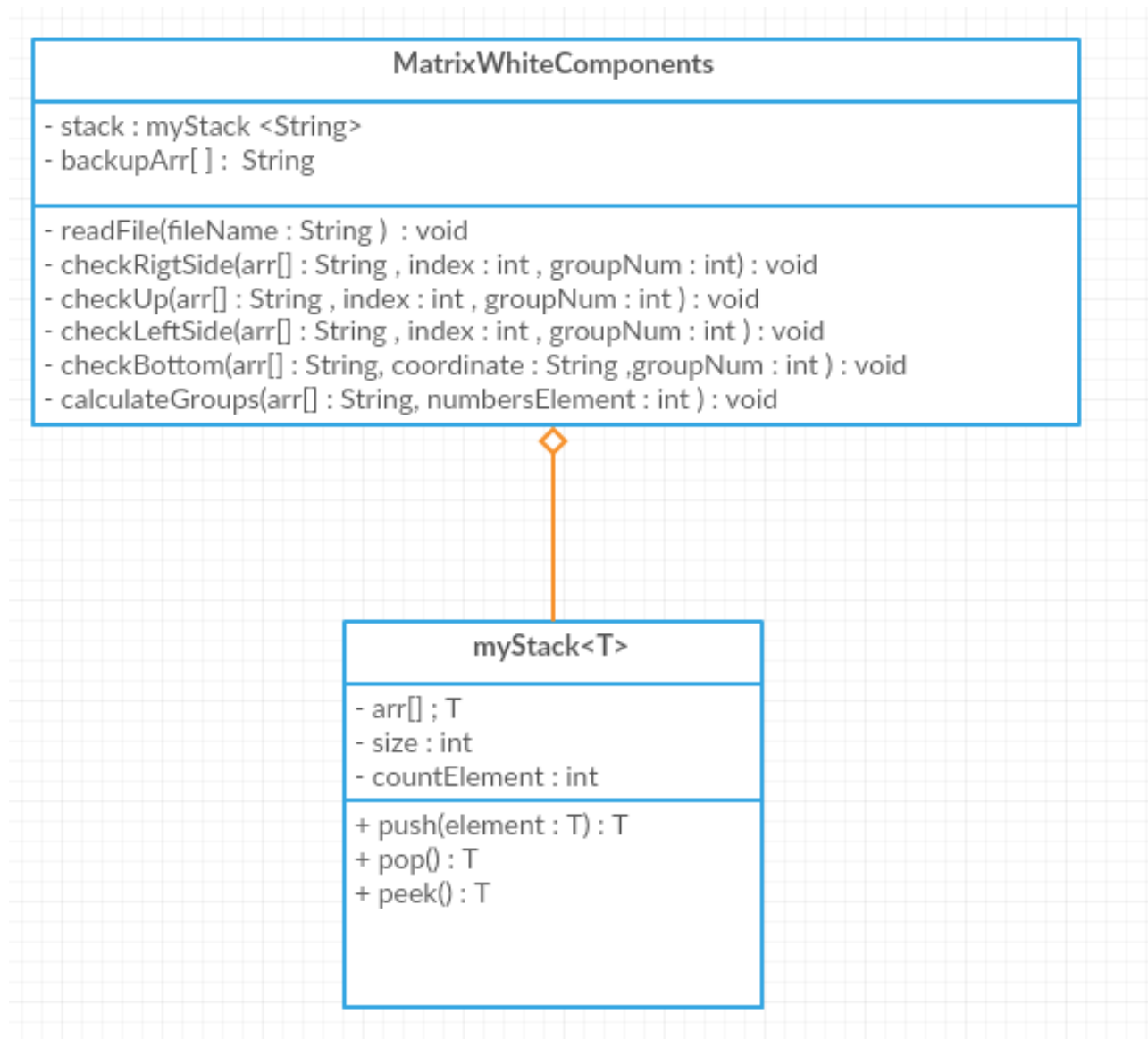
**Part2** : Like Part1 this program also run on IntelliJ IDE. You should enter a full path via command line for text this program. Test file should include one or more variables with values and after that it should contain a space. Finally, it should have an expression. There should'nt be anything except this. Also, expression should have space between tokens.

**IntelliJ IDE Requirements** : Minimum 2GB Ram, At least 2 GB harddisk space, Windows operating System.

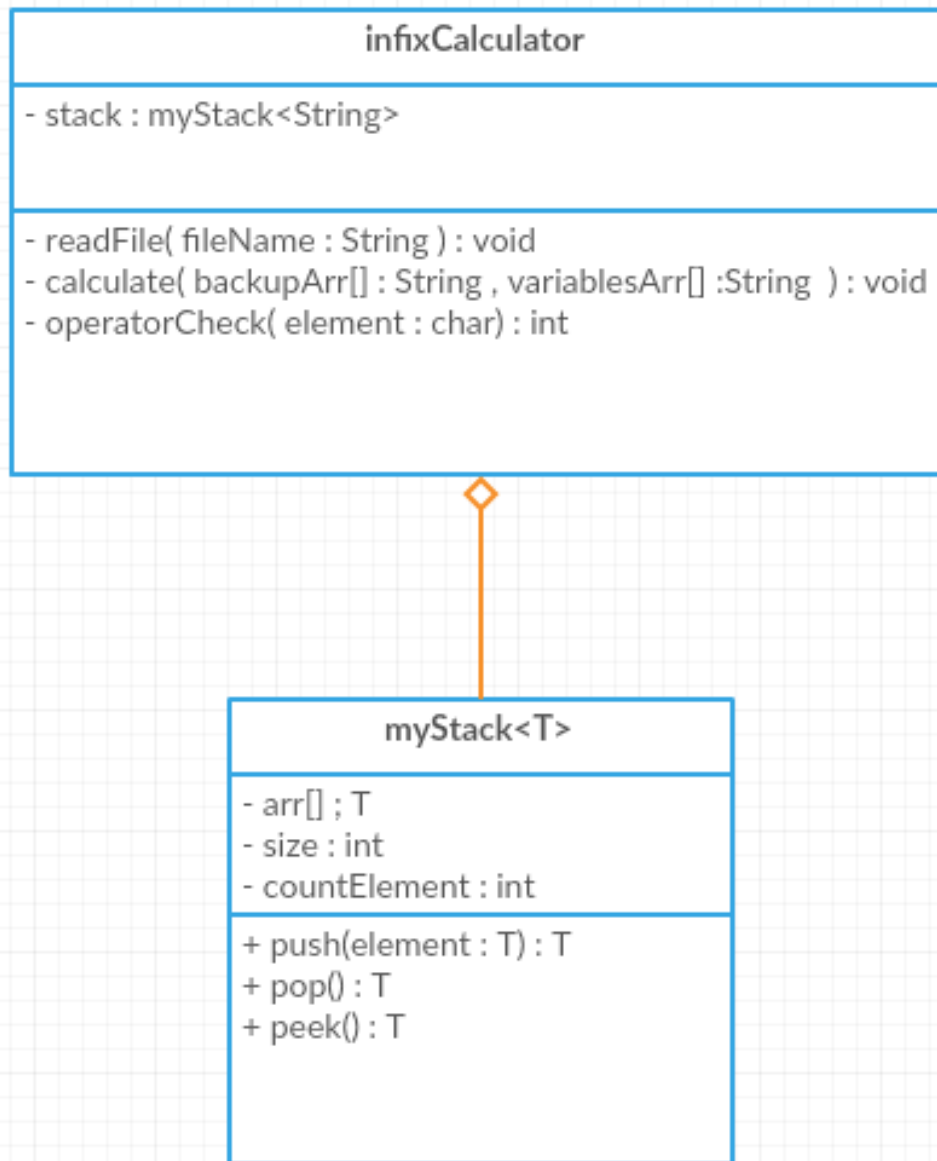
## 2 METHOD

### 2.1 Class Diagrams

PART1 UML :



## Part2 UML :



## 2.2 Use Case Diagrams

How is this software supposed to be used? What is expected of the user? What is that button for? Is the user supposed to press it, click it, punch it? Explain step by step how the user(s) are supposed to/expected to use your software - with diagrams if necessary.

## 2.3 Problem Solution Approach

**PART1:** Firstly, I try to hold short memory. So, I read file and pushed coordinates 1s into myStack. I hold stack string, because of I pushed coordinates like (1,23). If I didnt hold string, I should use another class like point for hold X and Y coordinate. In this solution, you dont have to hold another class objects. You should just split stack element with “,” and you will catch X and Y coordinate. After I saved coordinate into stack, I popped stack for save this coordinate into backupArr. I did it because of I should seach coordinate which one is be up, left,bottom or up. So, I detect first coordinate and I search all coordinate bottom, right, left, up relevant with this coordinate and if I find one of them, I assign this coordinate with minus number for determine groups. Finally, I pushed first elements and minus numbers groups into stack for count group numbers. The last, I pop stack and count group numbers.

**PART2 :** I read file until space for save variables and their values. After space, I started to push expression tokens into the stack until firs “)”. When I determine “)”, I started pop stack for calculate variables result. I popped stack 3 times because of determine values or variables. Also, I check if a determine variable or just number. For check it, I seach my variables array. This array holds variables and their values. When I search on it, I split this array with “=” and I determine variable and its value. When I finished calculate, I continue until determine another “)”. When array element finish, calculate will end and result will be printed on the screen.

## 3 RESULT

### 3.1 Test Cases

### 3.2 Running Results

## PART 1 AND PART2 TESTS

The screenshot shows an IDE with a project structure on the left, a main method in `Main.java` in the center, and a terminal window at the bottom.

**Project Structure (Left):**

- src
  - com
    - company
      - infixCalculator
      - input.txt
      - Main
      - MatrixWhiteComponents
      - myStack
      - test\_file\_part2.txt

**Main Method (Center):**

```

1 public static void main (String[] args) {
2     // Create an infix calculator
3     InfixCalculator ic = new InfixCalculator();
4     // Create a stack
5     Stack<Integer> s = new Stack<>();
6     // Create a floating decimal
7     FloatingDecimal fd = new FloatingDecimal();
8     // Create a myStack
9     myStack ms = new myStack();
10    // Create a NumberFormatException
11    NumberFormatException nfe = new NumberFormatException();
12    // Create a MatrixWhiteComponents
13    MatrixWhiteComponents mwc = new MatrixWhiteComponents();
14    // Create an input.txt
15    input.txt i = new input.txt();
16    // Create a description.html
17    description.html d = new description.html();
18    // Create an encodings.xml
19    encodings.xml e = new encodings.xml();
20    // Create a misc.xml
21    misc.xml m = new misc.xml();
22    // Create a modules.xml
23    modules.xml mo = new modules.xml();
24    // Create a project-template.xml
25    project-template.xml pt = new project-template.xml();
26    // Create a workspace.xml
27    workspace.xml w = new workspace.xml();
28    // Create a production
29    production p = new production();
29 }

```

**Terminal Window (Bottom):**

```

"C:\Program Files\Java\jdk1.8.0_111\bin\java.exe" ...
Number Of Groups = 9
w=5
x=6
( w + 4 ) * ( x - 77.9 )
Result is = -71.9

Process finished with exit code 0

```

src / com / company / input.txt

MatrixWhiteComponents.java x infixCal

C:\Users\emrek\IdeaProjects\hw3

1 0 0 0 0 0 0 0 0 0 0 0 0

2 0 0 1 0 0 0 1 0 0 0 0 0

3 0 1 1 1 1 0 0 1 0 1 0

4 0 1 1 0 1 0 0 0 0 1 1

5 0 0 0 1 1 0 0 0 1 1 0

6 0 0 0 0 0 0 0 0 0 0 0 0

.idea

description.html

encodings.xml

misc.xml

modules.xml

project-template.xml

workspace.xml

out

production

src

com.company

infixCalculator

input.txt

Main

MatrixWhiteComponents

myStack

test\_file\_part2.txt

hw3.iml

External Libraries

Scratches and Consoles

Main x

"C:\Program Files\Java\jdk1.8.0\_111\bin\java.exe"

Number Of Groups = 4

w=5






x=6

( 5 + 4 ) \* ( x - 10 )

Result is = -4.0

Process finished with exit code 0

src > com > company > input.txt

Project ▾     MatrixWhiteComponents.java ×  infixCalc

hw3 C:\Users\emrek\IdeaProjects\hw3

- .idea
  - description.html
  - encodings.xml
  - misc.xml
  - modules.xml
  - project-template.xml
  - workspace.xml
- out
- production
- src
  - com.company
    - infixCalculator
    - input.txt
    - Main
    - MatrixWhiteComponents**
    - myStack
    - test\_file\_part2.txt
- hw3.iml

External Libraries

Scratches and Consoles

Main ×

```
"C:\Program Files\Java\jdk1.8.0_111\bin\java.exe"  
Number Of Groups = 1  
w=5  
x=6  
( w + x ) * ( w * 10 )  
Result is = 50.0  
  
Process finished with exit code 0
```

1	1	0	0	0	0	0	0	0	0	0	0	0
2	1	1	1	1	1	1	1	1	1	1	1	1
3	1	1	1	1	1	1	1	1	1	1	1	1
4	1	1	1	1	1	1	1	1	1	1	1	1
5	1	0	0	0	0	1	0	0	0	0	0	1



MatrixWhiteComponents.java ×

infixCalcu

1	1 0 0 0 0 1	0 0 0 0 1
2	1 1 1 1 0 0	1 1 1 1 1
3	0 0 0 0 0 0	0 0 0 0 0
4	1 1 1 1 1 1	1 1 1 1 1
5	0 0 0 0 0 1	0 0 0 0 0

com.company

infixCalculator

input.txt

Main

MatrixWhiteComponents

myStack

test\_file\_part2.txt

Main ×

"C:\Program Files\Java\jdk1.8.0\_111\bin\java.exe"

Number Of Groups = 4

w=5

x=6

( 4 - x ) \* ( w + 10 )

Result is = 15.0

Process finished with exit code 0