Gebze Technical University
Computer Engineering

CSE 222 - 2019 Spring

HOMEWORK 3 REPORT

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1 INTRODUCTION

1.1 Problem Definition

Problem definition of part1 is; there is a binary digital image represented through a matrix of integers. 1 is White and 0 is black colour. We must calculate that how many island in these given binary digital image or we can say how many white area.

Problem definition of part2 is; we must write a program that from infix to postfix expression. Then, we must calculate the postfix expression and give as output. The expressions can include variables,functions and parenthesis.

1.2 System Requirements

There is not need to any specific piece of hardware. The solutions require JVM. I coded it on Intellij IDEA. It can run any operating system but the system have to include JVM. It is not a complex program. It can run anywhere.

2 METHOD

2.1 Use Case Diagrams

The part1 program is easy for users. They need to give input binary digital image as txt file. “1” is for white and “0” is for black. Users need to give pathname of txt file. Program calculates how many islands in the given input binary digital image and returns it to user. There is no button for this program.

The part2 program is easy for users,too. They need to give input as infix expression and values. Then, program convert it from infix expression to postfix expression. Finally, program calculates the converted postfix expression and returns result to user.

2.2 Problem Solution Approach

When I solving the part1 problem, I need to edit it at least linear complexity, it was hard to edit. I must to use stack data structure because it was easy to calculate how many island in that given input. I wrote a stack algorithm called MyStack. The MyStack class has a primitive array in it. It has top argument as index of top element of the stack. The stack has pop,push,peek and IsEmpty methods like original Java Stack

implementation. At first, I got digital binary image from txt file and stored in a two dimensional array. I edited a nested loop for wandering around two dimensional array.But the program does not evaluate all the elements of array because it enters only “1” elements. If there is “1”, push it to the stack and enters another loop for it’s neighbours. Program pushes all the neighbours to the stack and changes them according the next letter. If there is no neighbours, program understands that this is a end of island and count is increase. Finally, there is no element “1”, program ends and returns the result. The time complexity of SolutionPart1 function is linear complexity because program wanders “n” times in the two dimensional array.

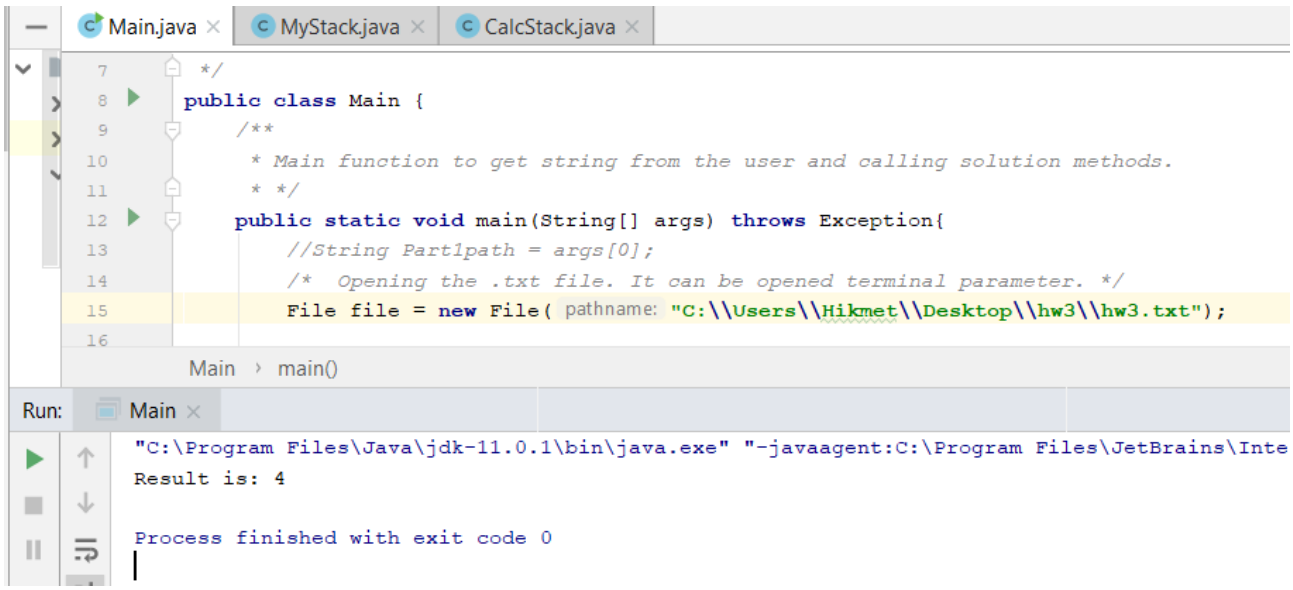
I could not solve the part2 because I could not evaluate and edit configuration algorithym of infix to postfix problem. I really worked on it but unfortunately I couldn’t.

3 RESULT

3.1 Test Cases

I tested it a lot of combinations. I tested it with input in the pdf and moodle page, I add some columns and rows. It Works every combination truely.

3.2 Running Results


Main.java
MyStack.java
CalcStack.java
*/
public class Main {
/**
* Main function to get string from the user and calling solution methods.
* */
public static void main(String[] args) throws Exception{
//String Part1path = args[0];
/* Opening the .txt file. It can be opened terminal parameter. */
File file = new File(pathname: "C:\\Users\\Hikmet\\Desktop\\hw3\\hw3.txt");
Main › main()
Run:
Main
"C:\Program Files\Java\jdk-11.0.1\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\Inte
Result is: 4
Process finished with exit code 0