

GTU Department of Computer Engineering
CSE 344 - SPRING 2022
HOMEWORK 1 REPORT

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1901042260

First of all, when I started this assignment, I had great problems with design at first. I thought about starting with the if condition for each case and moving on, but after a while I realized that it was impossible to calculate every condition. That's why I had to go for a different design, so I lost a lot of time.

But changing the design was a genius idea, I wish I had thought of it at the beginning.

I can say that I planned my design in general as follows:

- If there are parentheses, I remove the brackets and find possible inputs with the help of my recursive function.
- The cases where there are no parentheses do not change anything, the same function can give me the relevant inputs.
- I send these inputs to my star function (isMatch) and these inputs look at the words in the file. If it satisfies the regex rule, the function returns 1, otherwise it returns 0.
- If my isMatch function returns 1, I am changing the word according to the 2nd word.
- If my isMatch function doesn't return 1 then there is no match and I keep searching.

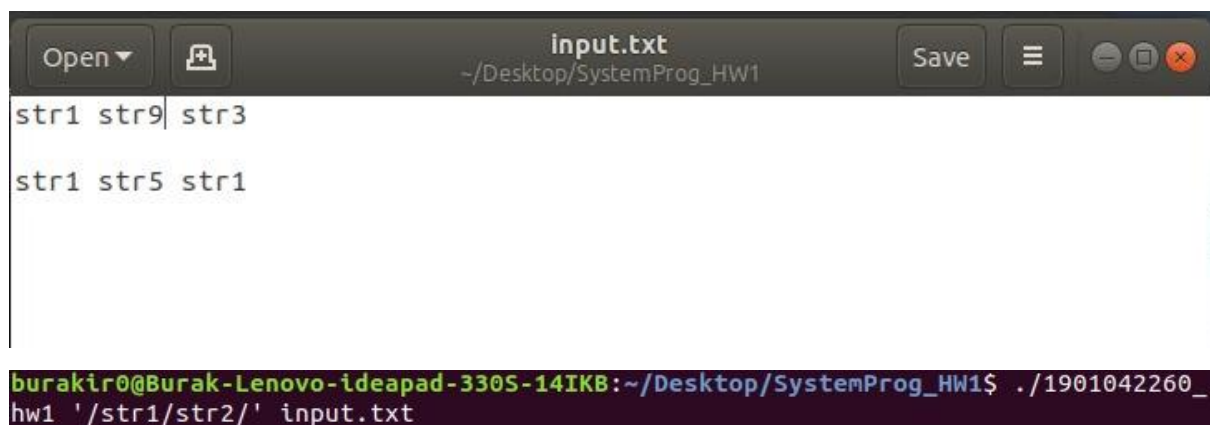
- [0] where isMatch returns only 1 if the command line argument starts with ^. I'm looking for lines.
- [lineSize-1] where isMatch returns 1 if my command line argument ends with \$. I'm looking at the lines.
- If both conditions exist, I look for lines that satisfy both conditions.
- If neither condition exists, I look at all the lines.
- I check if there is an i in the command line argument, if there is, I repeat the same steps with the isMatchWithI function. This function checks if it complies with the regex rule as case insensitive.
- if ';' in command line argument I send the command line argument to (';' + 1)th address as a recursive way.
- This repetition continues until reaching the final.
I also check in various ways whether the argument entered at the very beginning of this function is correct.
- For example, the first symbol must be '/', the second '/' must be an entry, and the end of the argument must end with '/'.

-I am using the `fcntl()` function to provide file lock as stated in the assignment document. I use the `F_SETLK` flag is the second process input, I terminate the program when it returns `-1`.

I also want to mention this. While writing the `star` function (`isMatch`), I wrote the algorithm inspired by stackoverflow. <https://stackoverflow.com/questions/15187888/the-complexity-of-simplified-regex-matching>

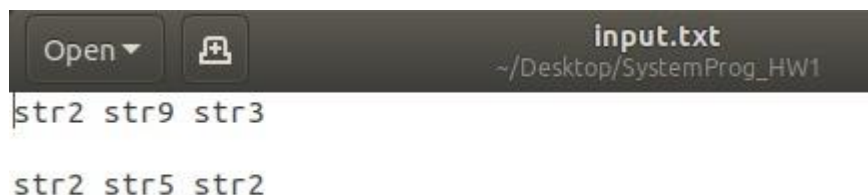
Some test cases:

1



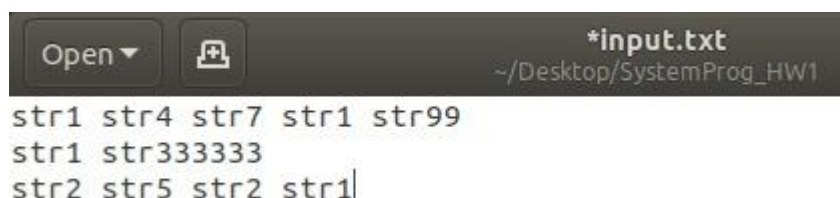
```
Open ▾  input.txt  Save  ~/Desktop/SystemProg_HW1
str1 str9 str3
str1 str5 str1

burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/str1/str2/' input.txt
```




```
Open ▾  input.txt  ~/Desktop/SystemProg_HW1
str2 str9 str3
str2 str5 str2
```

2




```
Open ▾  *input.txt  ~/Desktop/SystemProg_HW1
str1 str4 str7 str1 str99
str1 str333333
str2 str5 str2 str1
```


```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/^str1/str2/' input.txt
```

```
Open ▾  input.txt
~/Desktop/SystemProg_HW1
str2 str4 str7 str2 str99
str2 str333333
str2 str5 str2 str1|
```

3

```
Open ▾  input.txt
~/Desktop/SystemProg_HW1
str9 str4 str7 str232 str99
str7 str333333
str6 str5 str2 str1
str0 str1| str01 str1
```

```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/str1$/str2/' input.txt
```


```
Open ▾  input.txt
~/Desktop/SystemProg_HW1
str9 str4 str7 str232 str99
str7 str333333
str6 str5 str2 str2
str0 str2| str01 str2
```

4

```
Open ▾  *input.txt
~/Desktop/SystemProg_HW1
str1 str4 str7 str232 str99

str6 str5 str2 str1
str1 str67 str1| str98 str1
```

```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/^str1$/str2/' input.txt
```

```
Open ▾  input.txt
~/Desktop/SystemProg_HW1
str1 str4 str7 str232 str99

str6 str5 str2 str1
str2 str67 str2 str98 s|tr2
```

5

Open ▾  input.txt
~/Desktop/SystemProg_HW1

sTr1 str4 STR1 str232 str1

STR1 str5 str2 str1
str2 str1| str98 str2

```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_  
hw1 '/^str1/str2/i' input.txt
```

Open ▾  input.txt
~/Desktop/SystemProg_HW1

str2 str4 str2 str232 str2

str2 str5 str2 str2
str2 str1 str98 str2

6

Open ▾  input.txt
~/Desktop/SystemProg_HW1

st1 str4 str2 str232 str2
sTTTT1 st1 sT1 St1
STR1| str5 str2 str2
str1 str1 str98 str2

```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_  
hw1 '/^s[tr]*1/str2/i' input.txt
```

Open ▾  input.txt
~/Desktop/SystemProg_HW1

str2 str4 str2 str232 str2
str2 str2 str2 str2
STR1| str5 str2 str2
str1 str1 str98 str2

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```
input.txt
~/Desktop/SystemProg_HW1

stttt1 sr1 sR1 str2 str1 stp
sRrRRRRrR1 str34 str96 sTTTTT1
str90 stTTTTttt090
str34
sr3 ssssssstttttttr3 st3 str3
SSSRRR3 STTTTTR3
St5 SR5 st5 ST5
st5 sr5| s9856hzdgs st987
98406test st5 sT5 SR5
```

```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/^[s[tr]*1$/str2/i;/s*t*r3/str4/;/^[s[tr]5/str6/i' input.txt
```

```
input.txt
~/Desktop/SystemProg_HW1

stttt1 sr1 sR1 str2 str1 stp
str2 str34 str96 str2
str90 stTTTTttt090
str34
str4 str4 st3 str4
SSSRRR3 STTTTTR3
str6 str6 str6 str6
str6 str6 s9856hzdgs st987
98406test st5 sT5 SR5|
```

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```
burakir0@Burak-Lenovo-ideapad-330S-14IKB: ~/Desktop/SystemProg_HW1
File Edit View Search Terminal Help
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/str99/str59/' input.txt
Program start..
This application locked by another process!: Resource temporarily unavailable
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$

burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1
File Edit View Search Terminal Help
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/str99/str57/' input.txt
Program start..
^C
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ make 19010422
60_hw1
cc 1901042260_hw1.c -o 1901042260_hw1
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ ./1901042260_
hw1 '/str99/str57/' input.txt
Program start..

```

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```
==21047== HEAP SUMMARY:
==21047==    in use at exit: 0 bytes in 0 blocks
==21047== total heap usage: 1,049,603 allocs, 1,049,603 frees, 3,229,622,272 b
ytes allocated
==21047==
==21047== All heap blocks were freed -- no leaks are possible
==21047==
```

10

```
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$ gcc -Wall 1901042260_hw1.c
burakir0@Burak-Lenovo-ideapad-330S-14IKB:~/Desktop/SystemProg_HW1$
```