

Program #6: File conversion -- remove control blocking data from backups

Keller Sedillo-Garrido

CS 471

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Problem Description:

We have been given data that has been through a “backup” program. This program added extraneous data to the data. However, there is a pattern with the extraneous data. Our job is to use the patterns given to fix and print the data. We did this in three languages, python, java, and perl.

Python:

```
1  # Name      : Keller Sedillo-Garrido
2  # Date      : 10/18/2022
3  # Input     : No User Input
4  # Output    : Prints out File content
5  # PreCondition : No Precondition since no
6  #           : user input.
7  # PostCondition : This program will print
8  #           : out the content of the
9  #           : given file.
10
11 with open('control-char.txt') as f:
12     # Init Var
13     printOn = True # Value that determines if we should print
14     String = ""    # Holds String to print
15
16     # Loop through file input
17     while True:
18         # Read in char
19         c = f.read(1)
20
21         # Check if empty
22         if not c: break
23
24         if ascii(c) == ascii('\x03') : # Check ^C
25             printOn = False           # Turn Printing OFF
26         elif ascii(c) == ascii('\x02') : # Check ^B
27             printOn = True             # Turn Printing ON
28         elif printOn :                 # Check if Printing is ON
29             if ascii(c) == ascii('\n') : # Check for New Line
30                 print(String)           # Print String
31                 String = ""            # Empty String
32             else:                      # Else
33                 String = String + c    # Add String
```

Output:

```
base) keller@debianLaptop: ~/Documents/Fall-2022/CS 471 - Prog Lang Structure/Programming #6$ python fileConversion.py
This is line 1 This is line 1 This is line 1
This is line 2 This is line 2 This is line 2
This is line 3 This is line 3 This is line 3 A
This is line 4 This is line 4 This is line 4
This is line 5 This is line 5 This is line 5
This is line 6 This is line 6 This is line 6
This is line 7 This is line 7 This is line 7
This is line 8 This is line 8 This is line 8 A
This is line 9 This is line 9 This is line 9
This is line 10 This is line 10 This is line 10
This is line 11 This is line 11 This is line 11
This is line 12 This is line 12 This is line 12
This is line 13 This is line 13 This is line 13
This is line 14 This is line 14 This is line 14
This is line 15 This is line 15 This is line 15 B
This is line 16 This is line 16 This is line 16
This is line 17 This is line 17 This is line 17
This is line 18 This is line 18 This is line 18
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This is line 20 This is line 20 This is line 20 B
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This is line 24 This is line 24 This is line 24
This is line 25 This is line 25 This is line 25 B
This is line 26 This is line 26 This is line 26
This is line 27 This is line 27 This is line 27
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This is line 41 This is line 41 This is line 41
This is line 42 This is line 42 This is line 42
This is line 43 This is line 43 This is line 43
This is line 44 This is line 44 This is line 44
This is line 45 This is line 45 This is line 45
This is line 46 This is line 46 This is line 46
This is line 47 This is line 47 This is line 47
This is line 48 This is line 48 This is line 48
This is line 49 This is line 49 This is line 49 C
```

Perl:

```
1  # Name      : Keller Sedillo-Garrido
2  # Date      : 10/18/2022
3  # Input     : No User Input
4  # Output    : Prints out File content
5  # PreCondition : No Precondition since no
6  #           : user input.
7  # PostCondition : This program will print
8  #           : out the content of the
9  #           : given file.
10 # Reference  :
11 # ASCII TABLE : https://lwp.interglacial.com/appf\_01.htm
12
13 # Modules used
14 use strict;
15 use warnings;
16
17 # Variables
18 my $filename = 'control-char.txt'; # Name of the file
19 my $ctrlB = 2;                    # DEC value of ^B
20 my $ctrlC = 3;                    # DEC value of ^C
21 my $string = "";                  # Var to hold string
22 my $char;                          # Charater from inputed string
23 my $flag = 1;                     # Flag to print
24
25 # Open File
26 open(FH, '<', $filename) or die $!;
27
28 # Loop through file
29 while(<FH>){
30
31     # Get first line
32     my $line = $_;
```

```
31     # Get first line
32     my $line = $_;
33
34     # Loop through char in line
35     foreach $char (split //, $line) {
36
37         if(ord($char) == $ctrlC){    # Check if ^C
38             $flag = 0;              # Set flag FALSE
39         }elsif(ord($char) == $ctrlB){ # Check if ^B
40             $flag = 1;              # Set flag TRUE
41         }                           # END elsif
42
43         # Input char IF flag is true
44         $string = $string.$char if($flag);
45     } # END forEach
46
47     # Print out set of charater
48     if($flag){                      # Check if flag is TRUE
49         print $string;              # Print string
50         $string = "";              # Clean string
51     }                               # END if
52 }# END while
53 print("\n");
54 close(FH);
```

Output:

```
(base) keller@debianLaptop:~/Documents/Fall-2022/CS 471 - Prog Lang Structure/Programming #4$ perl fileConversion.pl
This is line 1 This is line 1 This is line 1
This is line 2 This is line 2 This is line 2
This is line 3 This is line 3 This is line 3 A
This is line 4 This is line 4 This is line 4
This is line 5 This is line 5 This is line 5
This is line 6 This is line 6 This is line 6
This is line 7 This is line 7 This is line 7
This is line 8 This is line 8 This is line 8 A
This is line 9 This is line 9 This is line 9
This is line 10 This is line 10 This is line 10
This is line 11 This is line 11 This is line 11
This is line 12 This is line 12 This is line 12
This is line 13 This is line 13 This is line 13
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This is line 45 This is line 45 This is line 45
This is line 46 This is line 46 This is line 46
This is line 47 This is line 47 This is line 47
This is line 48 This is line 48 This is line 48
This is line 49 This is line 49 This is line 49 C
This is line 50 This is line 50 This is line 50 D
```

Java:

```
32 // Read and print file
33 while (scanner.hasNextLine()){
34     // Get line
35     String line = scanner.nextLine().toString();
36
37     // Check for ^C & ^B
38     for(int i = 0; i < line.length(); i++){ // Loop through String
39         if (line.charAt(i)== etx){ // Check if ^C
40             flag = false; // Set flag false
41         }else if(line.charAt(i) == stx){ // Check if ^B
42             flag = true; // Set flag true
43         } // END elseIf
44
45         // If flag is true, save char
46         if(flag) stringSet = stringSet + line.charAt(i);
47     } // END FOR
48
49     // Print if newline
50     if (flag){ // Check flag
51         System.out.println(stringSet); // Print String Set
52         stringSet = ""; // Clean String Set
53     } // END if
54 } // END while
55
56 // Close scanner once done
57 scanner.close();
58 } catch (Exception e){
59     // Print Error
60     System.err.println(e);
61 } // END tryCatch
62 } // END main
63 } // END fileConversion
64
```

```
1 // Name : Keller Sedillo-Garrido
2 // Date : 10/18/2022
3 // Input : No User Input
4 // Output : Prints out File content
5 // PreCondition : No Precondition since no
6 // : user input.
7 // PostCondition : This program will print
8 // : out the content of the
9 // : given file.
10
11 // Libraries
12 import java.io.File;
13 import java.util.Scanner;
14
15 public class fileConversion {
16     // Global Var
17     static char stx = (char)2; // ^B Char
18     static char etx = (char)3; // ^C Char
19     Run | Debug
20     public static void main(String[] args) {
21         try{
22             // Get File
23             File file = new File("control-char.txt"); // Create file Class
24             if(!file.exists()){ // Check if file exists
25                 throw new Exception("File Doesn't Exist"); // throw Exception
26             } // END if
27
28             // Init. Var.
29             Scanner scanner = new Scanner(file); // Scanner for file
30             Boolean flag = true; // Flag for printing
31             String stringSet = ""; // String Set to print
32
33             // Read and print file
34             while (scanner.hasNextLine()){
35                 // Get line
36                 String line = scanner.nextLine().toString();
37             }
38         }
39     }
40 }
```

Output:

```
(base) keller@debianLaptop:~/Documents/Fall-2022/CS 471 - Prog Lang Structure/Programming #6$ java fileConversion
This is line 1 This is line 1 This is line 1
This is line 2 This is line 2 This is line 2
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```

Analysis:

Different languages have different ways of handling file input and reading. Python seems to be straightforward on opening and reading files. The only real trouble is converting each input to ascii and comparing it to “^C” and “^B”. Java took a little longer since I used a scanner to read the file. However, there are other java classes that could remove the clutter and simplify the process. Also Java uses a try catch system which means that I had to program how to handle the exception compared to the other two languages. Perl took a little long to program since I was not familiar with the language. But reading in the file and looping through it is so simple the call in program.

Conclusion:

All three programming languages are able to read it and fix the extraneous data. However, each program has its strengths and weaknesses when it comes to implementing the code.