

Joseph Camacho-Terrazas

10/26/2020

File conversion -- remove control blocking data from backups

Problem Description

For this problem, given a text file, I was to remove the control characters using Java, Python, and Perl. This was a bit tricky, because I had to ensure that when I read in the files in each language, it would preserve all the control characters. To verify this, after I read the file into a string in each program, I wrote it directly back to a new file and checked it in Vim on the lab computers (I removed the code that did this for my final submission). All my programs preserved the control characters correctly, so I proceeded to elimination. To do this, I used a system of flags. For Perl and Python, the file is read one character at a time. That character is stored in a variable, and is converted to its ASCII value, then it's compared to the ASCII value of the ctrl-b and ctrl-c characters. If we meet a ctrl-c, we know not to print that and anything after it until we hit a ctrl-b. So, the flag is set to 0. Once we hit a ctrl-b, we can set the flag to 1 again, but we need to use a next/continue to make sure that we skip to the next iteration of the loop, so we don't print the ctrl-b. Finally, the loop reaches the last conditional, and will print the character to the file if the print flag is 1. The only difference with Java is the buffered reader, which automatically reads the character as an integer. This means we don't have to cast the character to an integer, otherwise it functions the same as the other two.

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Java Code and Output

```
/*Joseph Camacho-Terrazas
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*Input: The backup text file
*Output: Resulting string after eliminating control characters
*Preconditions: The file must exist and filename must be valid
*Postconditions: Print the resulting string after eliminating all control characters
*/

import java.util.*;
import java.io.*;

public class ControlChar {
    public static void main(String[] args) {
        try {
            //Declare the input and output files
            File input = new File("control-char.txt");
            File output = new File("javaoutput.txt");
            //Create a file reader, file writer, and buffered reader
            FileReader fr = new FileReader(input);
            FileWriter fw = new FileWriter(output);
            BufferedReader br = new BufferedReader(fr);
            //c stores value from buffered reader
            int c = 0;
            //Print flag allows us to print when it's 1
            int printFlag = 1;

            //Loop through the file using buffered reader
            while ((c = br.read()) != -1) {
                //Buffered reader gives us ints, so compare ascii values
                //If c is ctrl-c, printFlag is 0
                if(c == 3) {printFlag = 0;}
                //If c is ctrl-b, printFlag is 1 and skip to next iteration
                if(c == 2) {printFlag = 1; continue;}
                //If printFlag is 1, write c to the file
                if(printFlag == 1) {
                    fw.write(c);
                }
            }
        }
    }
}
```

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```
        //close all open readers and writers
        fr.close();
        fw.close();
        br.close();
    }

    catch (IOException e) {
        //Catch any IO Exceptions
        System.out.println("There was an error" + e);
    }
}
}
```

```
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> javac ControlChar.java
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> java ControlChar
File created successfully javaoutput.txt
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> vim javaoutput.txt
```

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```
jterrazas@babbage.cs.nmsu.edu:22 - Bitvise xterm
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
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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
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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
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This is line 37 This is line 37 This is line 37
This is line 38 This is line 38 This is line 38
This is line 39 This is line 39 This is line 39
This is line 40 This is line 40 This is line 40
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
This is line 50 This is line 50 This is line 50 D
~
~
"javaoutput.txt" [dos] 50L, 2533C
```

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Perl Code and Output

```
#Joseph Camacho-Terrazas
#10/26/2020
#Input: The backup text file
#Output: Resulting string after eliminating control characters
#Preconditions: The file must exist and filename must be valid
#Postconditions: Print the resulting string after eliminating all control characters

#!/usr/bin/perl
use warnings;
use strict ;

#Declare input and output files
my $inputFile = "control-char.txt";
my $outputFile = "perloutput.txt";
#finalString stores the cleaned string
my $finalString = "";
#Read and char declared for the reader
my $read;
my $char;
#printFlag will let us print if it's 1
my $printFlag = 1;

#Open the input file using file handler
open FILE, '<', $inputFile or die "Can't open file! $!";

#Read through the file one char at a time
while ($read = read FILE, $char, 1) {
    #Convert char to ascii value and compare to ctrl values
    #If char is ctrl-c printFlag is 0
    if(ord($char) == 3) {
        $printFlag = 0;
    }
    #If char is ctrl-b printFlag is 1
    if(ord($char) == 2) {
        $printFlag = 1;
    }
    #Skip to next iteration on a ctrl-b
    next if(ord($char) == 2);
    #If printFlag is one we add the char to the final string
```

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```
    if($printFlag == 1) {  
        $finalString .= $char;  
    }  
}  
#Open the output file and print the final output string to it  
open FILE, ">", $outputFile or die "Can't open the file! $!";  
print FILE $finalString;  
print "File created successfully $outputFile\n";
```

```
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> perl ControlChar.pl  
File created successfully perloutput.txt  
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> vim perloutput.txt
```

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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
~
~
"perloutput.txt" [dos] 50L, 2533C
```

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Python Code and Output

```
#Joseph Camacho-Terrazas
#10/26/2020
#Input: The backup text file
#Output: Resulting string after eliminating control characters
#Preconditions: The file must exist and filename must be valid
#Postconditions: Print the resulting string after eliminating all control characters

import string

#create a flag that will allows us to print
printFlag = 1
#Open the input and output files
f1 = open("control-char.txt")
f2 = open("pythonoutput.txt", "w")

while True:
    #Read one character of the file into c
    c = f1.read(1)

    #Break out of the loop at the end of the file
    if not c:
        break
    #Convert the chars to ascii values, and compare to control char value
    #If current char is ctrl-c, print flag is 0
    if ord(c) == 3:
        printFlag = 0
    #If current char is ctrl-b, print flag is 1 and skip to next iteration
    if ord(c) == 2:
        printFlag = 1
        continue
    #If print flag is 1, then write it to the output file
    if printFlag == 1:
        f2.write(c)

#User confirmation about the output file creation
print ("File created successfully ")
print (f2.name)

#Close all open files
f1.close()
f2.close()
```


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```
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> python ControlChar.py  
File created successfully  
control-char.txt  
jterrazas@babbage:~/Documents/programs/CS 471/Control Character Blocking> vim pythonoutput.txt
```

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~
~
"pythonoutput.txt" [dos] 50L, 2533C
```