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* Project: Assignment 2 – Buffered I/O
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* File: WriteUp2.pdf
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* Description: This is the write up file for the program and it includes a description
* of the project, what I did, issues I had, how I overcame the issues,
* compilation and execution output from the original program.
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Description: In this program, we create our own file descriptor which is just an integer index into an array and we maintain that for each open file. We then use the Linux open, read and close functions. We store the Linux file descriptor value and doesn't expose it to the caller. The main file executes the program and reads the file and passes it to the buffer accordingly.

What I did: I created my own file descriptor which is used to store the index of the File Control Block that we will be returning from b_open function. First, I initialize all the variables from the struct and return the index of file control block which is not in use. I also see if there is any error opening the file and print the respective code. Then I added the buffered read function to return the data and number of bytes read. I also check if the position of my file descriptor is at the beginning of the buffer and also if buffer count is less than 512 bytes. If it is, then go ahead to read the next 80 bytes, else reload the buffer and get the remaining bytes. If the remaining bytes are less than requested bytes, then just copy the former and call read() function to print the rest within the 80 byte buffer. Then we also check we reached the end of file. Then resetting the buffer position to the beginning and copying the remaining bytes. Incrementing and resetting buffer position is done respectively. Finally after everything is executed and displayed, close the file and release the buffer using Linux System Calls.

Issues I had: This assignment was tough and really time consuming. The problems I had were to implement the pseudo plan and the buffer conditions in the b_read. To keep the count of the buffer and linux file descriptor was the most difficult but finally with the help of fellow mates and study groups, I was able to manage it.

Compilation and Execution :

1.

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assignment-2-buffered-i-o-developer-soni — devsoni@Devs-MacBook-Pro — ..eveloper-soni —
(base) → assignment-2-buffered-i-o-developer-soni git:(main) × ls
DecOfInd.txt      README.md          b_io.h             x.c
Makefile          b_io.c            soni_dev_HW2_main.c
(base) → assignment-2-buffered-i-o-developer-soni git:(main) × make
gcc -c -o soni_dev_HW2_main.o soni_dev_HW2_main.c -g -I.
gcc -c -o b_io.o b_io.c -g -I.
gcc -o soni_dev_HW2_main soni_dev_HW2_main.o b_io.o -g -I.
(base) → assignment-2-buffered-i-o-developer-soni git:(main) × make run
./soni_dev_HW2_main DecOfInd.txt
The unanimous Declaration of the thirteen united States of America, When in the
Course of human events, it becomes necessary for one people to dissolve the poli
tical bands which have connected them with another, and to assume among the powe
rs of the earth, the separate and equal station to which the Laws of Nature and
of Nature's God entitle them, a decent respect to the opinions of mankind requir
es that they should declare the causes which impel them to the separation.

We h
old these truths to be self-evident, that all men are created equal, that they a
re endowed by their Creator with certain unalienable Rights, that among these ar
e Life, Liberty and the pursuit of Happiness.--That to secure these rights, Gove
rnments are instituted among Men, deriving their just powers from the consent of
the governed, --That whenever any Form of Government becomes destructive of the
se ends, it is the Right of the People to alter or to abolish it, and to institu
te new Government, laying its foundation on such principles and organizing its p
owers in such form, as to them shall seem most likely to effect their Safety and
Happiness. Prudence, indeed, will dictate that Governments long established sho
uld not be changed for light and transient causes; and accordingly all experienc
e hath shewn, that mankind are more disposed to suffer, while evils are sufferab
le, than to right themselves by abolishing the forms to which they are accustome
d. But when a long train of abuses and usurpations, pursuing invariably the same
Object evinces a design to reduce them under absolute Despotism, it is their ri
ght, it is their duty, to throw off such Government, and to provide new Guards f
or their future security.--Such has been the patient sufferance of these Colonie
s; and such is now the necessity which constrains them to alter their former Sys
tems of Government. The history of the present King of Great Britain is a histor
y of repeated injuries and usurpations, all having in direct object the establis
hment of an absolute Tyranny over these States. To prove this, let Facts be subm
itted to a candid world.

He has refused his Assent to Laws, the most wholesome
and necessary for the public good.

He has forbidden his Governors to pass Laws
of immediate and pressing importance, unless suspended in their operation till h
is Assent should be obtained; and when so suspended, he has utterly neglected to
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2.

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assignment-2-buffered-i-o-developer-soni — devsoni@Devs-MacBook-Pro — ..eveloper-soni —  
rary government, and enlarging its Boundaries so as to render it at once an exam  
ple and fit instrument for introducing the same absolute rule into these Colonie  
s:  
  
For taking away our Charters, abolishing our most valuable Laws, and alterin  
g fundamentally the Forms of our Governments:  
  
For suspending our own Legislatur  
es, and declaring themselves invested with power to legislate for us in all case  
s whatsoever.  
  
He has abdicated Government here, by declaring us out of his Prot  
ection and waging War against us.  
  
He has plundered our seas, ravaged our Coasts  
, burnt our towns, and destroyed the lives of our people.  
  
He is at this time tr  
ansporting large Armies of foreign Mercenaries to compleat the works of death, d  
esolation and tyranny, already begun with circumstances of Cruelty & perfidy sca  
f all ages, sexes and conditions.  
  
In every stage of these Oppressions We have P  
etitioned for Redress in the most humble terms: Our repeated Petitions have been  
answered only by repeated injury. A Prince whose character is thus marked by ev  
ery act which may define a Tyrant, is unfit to be the ruler of a free people.  
  
N  
or have We been wanting in attentions to our Brittish brethren. We have warned t  
hem from time to time of attempts by their legislature to extend an unwarrantabl  
e jurisdiction over us. We have reminded them of the circumstances of our emigra  
tion and settlement here. We have appealed to their native justice and magnanimi  
ty, and we have conjured them by the ties of our common kindred to disavow these  
usurpations, which, would inevitably interrupt our connections and corresponde  
nce. They too have been deaf to the voice of justice and of consanguinity. We mus  
t, therefore, acquiesce in the necessity, which denounces our Separation, and ho  
ld them, as we hold the rest of mankind, Enemies in War, in Peace Friends.  
  
We,  
therefore, the Representatives of the united States of America, in General Congr  
ess, Assembled, appealing to the Supreme Judge of the world for the rectitude of  
our intentions, do, in the Name, and by Authority of the good People of these C  
olonies, solemnly publish and declare, That these United Colonies are, and of Ri  
ght ought to be Free and Independent States; that they are Absolved from all All  
egiance to the British Crown, and that all political connection between them and  
the State of Great Britain, is and ought to be totally dissolved; and that as F  
ree and Independent States, they have full Power to levy War, conclude Peace, co  
ntract Alliances, establish Commerce, and to do all other Acts and Things which  
Independent States may of right do. And for the support of this Declaration, wit  
h a firm reliance on the protection of divine Providence, we mutually pledge to  
each other our Lives, our Fortunes and our sacred Honor.  
  
(base) → assignment-2-buffered-i-o-developer-soni git:(main) ×
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