

Assignment 2B -Buffered I/O read

Description:

Assignment 2B – Buffered I/O read was an assignment to write 3 buffered functions and fill in a file control block typedef struct. The 3 functions were `b_open` which we started by finding a free fcb in the `fcbArray` and then initialized its elements correctly. `B_read` took a user's buffer and either filled it with what was in a preset 512 byte buffer or if the bytes available within that buffer was too small, we dump what we have in that buffer and reload it with `lbaRead` and then fill in the remaining count needed. `B_close` was a function to free fcb in reference to a file descriptor.

Approach / What I Did:

To break down what I did I split the assignment into 4 parts, the buffered open, buffered close, buffered read dump buffer, buffered read dump buffer and refill once.

In buffered open I started immediately with `b_getFCB` which fetched me a free fcb from `fcbArray` or if it returned -1, I would just immediately return -1 meaning there were no fcb available out of the array. I then fill my struct with the appropriate items. For example I filled my file information (`fi`) with the return from `getFileinfo` and I passed in the (`filename`). I then set my structure's internal file descriptor with the file descriptor I found from `b_getFCB`. I then malloc a 512 chunk and have a `char *` point to it. I then read into that malloced buffer with `LBaread` with the correct parameters. I then updated the file location within "`fi`" since I just called `lbreadd`. Then I initialize my buffer bookmark/bytes available from buffer to 0.

In buffered close I free the malloced buffer from `b_open` and set it to reference a null, and then I set the "`fi`" to null so the array knows that this specific array element can be reinitialized with another `b_open`.

In buffered read, I separated `b_read` into two else statements where the program immediately `memcpy` from the internal buffer to user buffer. If the internal buffer cannot handle the number of bytes needed to cleanly fill the user's buffer with what is has, it will first dump what it has with `memcpy` into the user buffer (keeping track of where I am at in the internal buffer with `bufferBookmark`) and update its count with what was filled during this first `memcpy`, secondly the program reloads that buffer with an `LBaread` which resets the available bytes that the internal buffer can give, then thirdly checks to see if the count needed is greater than 0 after updating it in the first `memcpy` and then `memcpy` "count" number of bytes needed.

Issues and Resolutions:

Huge issues with this assignment, firstly `LBaread` was nothing what I thought it was and had trouble using it and deciphering what the parameters meant which caused me HUGE headaches for days to finally figure out what they meant. After I figured out what `LBaread` meant the rest of the program was simple.

Analysis: n/a

Screen shot of compilation:

See screen shot of execution of the program for screenshot of compilation.

Screen shot(s) of the execution of the program:

```
student@student-VirtualBox:~/Documents/github projects/csc415-assignment-2b-tzphuang$ make clean
rm b_io.o huang_tony_HW2b_main
student@student-VirtualBox:~/Documents/github projects/csc415-assignment-2b-tzphuang$ make run
gcc -c -o b_io.o b_io.c -g -I.
gcc -o huang_tony_HW2b_main b_io.o 2b-main.o -g -I.
./huang_tony_HW2b_main DATA 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
red to bring on the inhabitants of our frontiers, the merciless Indian Savages,
whose known rule of warfare, is an undistinguished destruction of all ages, sexe
s and conditions.

In every stage of these Oppressions We have Petitioned for Re
dress in the most humble terms: Our repeated Petitions have been answered only b
y repeated injury. A Prince whose character is thus marked by every act which ma
y define a Tyrant, is unfit to be the ruler of a free people.

Nor have We been
wanting in attentions to our Brittish brethren. We have warned them from time to
time of attempts by their legislature to extend an unwarrantable jurisdiction o
ver us. We have reminded them of the circumstances of our emigration and settleme
nt here. We have appealed to their native justice and magnanimity, and we have
conjured them by the ties of our common kindred to disavow these usurpations, wh
ich, would inevitably interrupt our connections and correspondence. They too hav
e been deaf to the voice of justice and of consanguinity. We must, therefore, ac
quiesce in the necessity, which denounces our Separation, and hold them, as we h
old the rest of mankind, Enemies in War, in Peace Friends.

We, therefore, the R
epresentatives of the united States of America, in General Congress, 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 Colonies, solemnly
publish and declare, That these United Colonies are, and of Right ought to be
Free and Independent States; that they are Absolved from all Allegiance to the B
ritish Crown, and that all political connection between them and the State of Gr
eat Britain, is and ought to be totally dissolved; and that as Free and Independ
ent States, they have full Power to levy War, conclude Peace, contract Alliances
, establish Commerce, and to do all other Acts and Things which Independent Stat
es may of right do. And for the support of this Declaration, with a firm relianc
e on the protection of divine Providence, we mutually pledge to each other our L
ives, our Fortunes and our sacred Honor.

student@student-VirtualBox:~/Documents/github projects/csc415-assignment-2b-tzphuang$
```