11210CS 543200 Advanced UNIX Programming

Assignment 3 (5 pts)

Due: Oct 14, 2023, at 23:59:59

**What to hand in**

1. Your implementation code. You should name it “**assignment3.c**”.
2. A makefile that can compile your code. You should name it “**Makefile**”.
3. A report that contains the answer to the questions, screenshots of your results, and explanations of how you implemented your code. You should name it “***Group\_id*.pdf**”.
4. Please upload all the code files separately and the pdf (do not zip them) to eeclass.

**Notice**

1. Please name your file properly; 2 pts will be taken out for incorrectly-named files.
2. Late submission is not allowed. You will receive 0 point in that case.
3. Plagiarism is not allowed. We will pass your source codes through a tool called “moss”, which is an anti-plagiarism service provided by Stanford University to determine the similarity of programs. If your program has > 20% similarity with your classmates, you will receive 0 point; no exception will be made. (Hint: Please do not share your code with fellow students. Discuss with them instead.)

**Specifications**

BSD-based systems provide a function called funopen that allows us to intercept read, write, seek, and close calls on a stream. Use this function to implement fmemopen for FreeBSD.

In your fmemopen, you should create a memory structure to initialize a file stream, and use funopen to deal with it with the following functions:

1. Read
2. Write
3. Seek
4. Close

In the main function, you should use your fmemopen function to:

1. **(1 pt) Write** “*hello, world*” in the file stream.
2. **(1 pt) Seek** the position of “*world*” in the file stream.
3. **(1 pt) Read** the word“*world*” from the file stream and **print** it.
4. **(1 pt) Print** the whole sentence “*hello, world*”.
5. **(1 pt) Close** the file stream correctly.

(Notice that the order of the 5 tasks above is not fixed. You should figure out which one to do first to complete all of them correctly.)

**Additional Notes**

1. You can only use funopen to implement fmemopen.
2. **Printing the words directly is forbidden**! We will check your source codes.
3. All of your code should be implemented within one .c file.
4. **Every output of your codes should follow the same format as the sample outputs** given below, otherwise, you will not get the points.

(We will compare your print results with the sample output.)

**Sample Output**

world

hello, world