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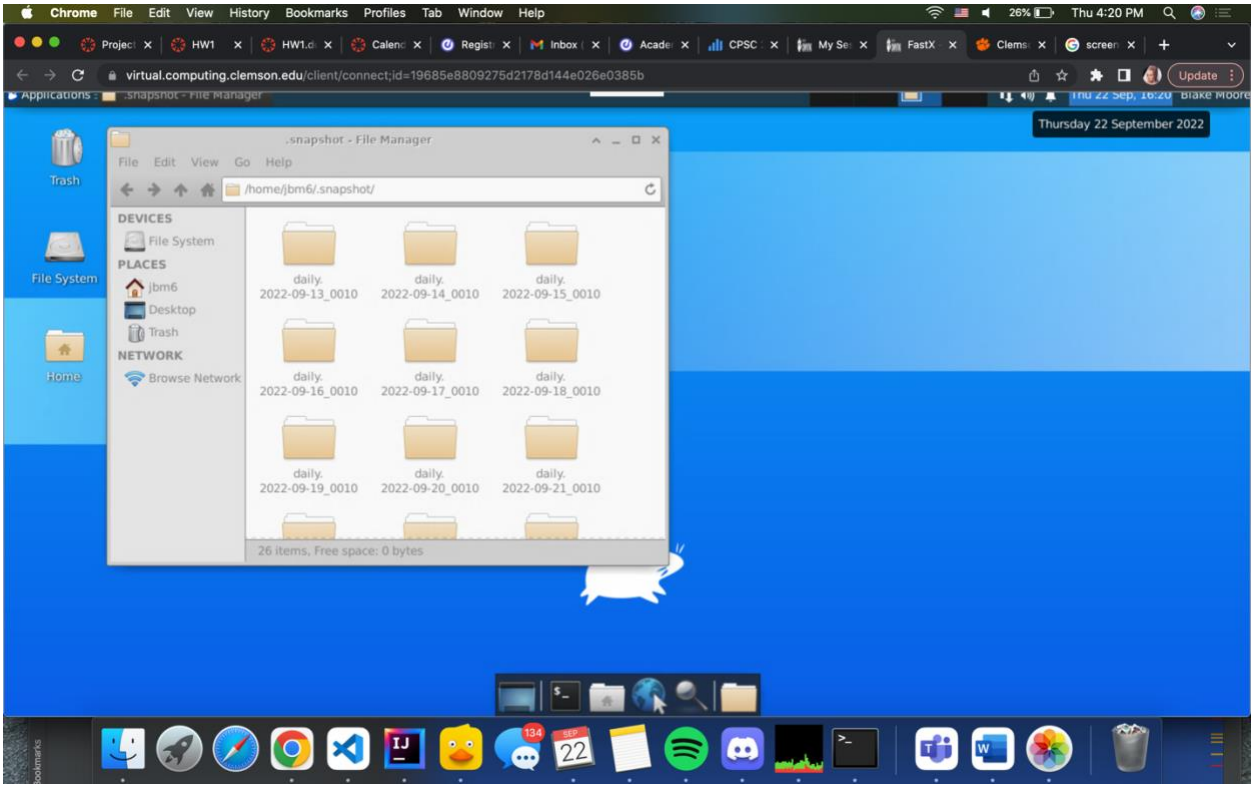
CPSC 2310 Homework
Due: Thursday, September 22, 2022, 11:59 PM

1. What is the name of the file that contains a backup of your home folder on the SoC servers?
   .snapshot

2. Using a SoC server, make a screenshot of the file from question 1 above and place it in this file.



3. File handling in ‘C’ has 4 basic operations. What are the 4 operations you can do with files?

   Create new file, open existing file, closing a file, and reading/writing information to a file

4. In ‘C’ we typically use 2 types of files with respect to file handling(reading and writing). Name the two types and the advantages each type has.
   .txt – readable and editable
   .bin – can hold more data, not easily readable, more secure

5. Match the File Pointer Mode with the appropriate Meaning. (Some meanings may be used more than one time.)

   A. Open for both reading and writing
   B. Open for reading
   C. Open for writing
   D. Open for both reading and appending
   E. Open for both reading and appending in binary mode
   F. Open for both reading and writing in binary mode
   G. Open for appending. Data is added to the end of the file
   H. Open for append in binary. Data is added to the end of the file
   I. Open for writing in binary mode
   J. Open for reading in binary mode

   __B___ r ___J__ rb

   __C___ w ___I__ wb

   ___G__ a ___H__ ab

   ___A__ r+ ___F__ rb+

   ___A__ w+ ___F__ wb+

   __D___ a+ ___E__ ab+

6. With respect to file pointers in code, if a file pointer is opened for reading and the file does not exist, what happens?
   it will return NULL

7. With respect to file pointers in code, if a file pointer is opened for appending but the file does not exist, what happens?
   It will be created

8. With respect to file pointers in code, if a file pointer is opened for writing and the file already contains data, describe what happens?
   Content will be ovewritten

9. Fill in the blank:

   Assert is a C function used to test assumptions made by programmers and evaluates to True or False.

10. What does the C function **rewind** do and what is the disadvantage of using **rewind**?
    It moves the file ptr to the beginning of the file or buffer
    Disadvantage – cannot check if it is successful, it clears the error indicator

11. What does the C function fseek do and what are the three constants often used with fseek?
    Fseek sets the file ptr position
    3 constants – SEEK_CUR SEEK_END SEEK_SET

12. In class we discussed a function that is often used with fseek that returns the current position of the file pointer. Name the function.
    ftell

13. Define a structure that represents a student that contains variables for the student's first name, last name, identification number(no characters), and class standing. Use a number for the class standing. (Meaning: 1 would be a freshman). Assume the first and last names have no more than 20 characters. Use typedef to allow me to create a struct in the following ways:

    ```
    struct Student stu;
    or
    student_t stu;

    typedef struct Student{
            char fName[20];
            char lName[20];
            int IDnum;
            int classStanding;
    } student_t;
    ```

14. Define a structure that represents a Car that contains variables that represent the make of the car, model of the car, year of the car and Color of the car. Use an initialization list to create an instance of the struct initializing the struct to Honda, CR-V, 2021, Silver.

```
struct Car
{
        string make, model, color, year;
};
struct car {string make, model, year, color} car1 ={ “Honda”, ”CR-V”, “ 2021” , “Silver” };
```

15. Given the following struct:

```
struct test
{
        char    a;
        int     b;
        short   c;
        int     d;
};
```

How many bytes of memory will be needed for this struct? ___16_

Draw a box below, using the box, label the layout of the memory for this struct. Label any needed padding using diagonal lines.

16. Rewrite the struct above in a way that will minimize the amount of padding needed. How many bytes in memory will be needed for the new improved structure?

```
struct test
{
        int     b;
        int     d;
        char    a;
        short   c;
};
```

12 bytes of memory

17. Consider the following struct. In class we discussed the problem with this struct. Explain the problem and how we can fix this struct.

```
struct SELF_REF{
        int a;
```

```
        struct SELF_REF B;
        int c;
};
```

The compiler needs to know the size of the struct to create enough memory for it. It does not know how much memory to use at this current state. To fix this, make the self reference a pointer.

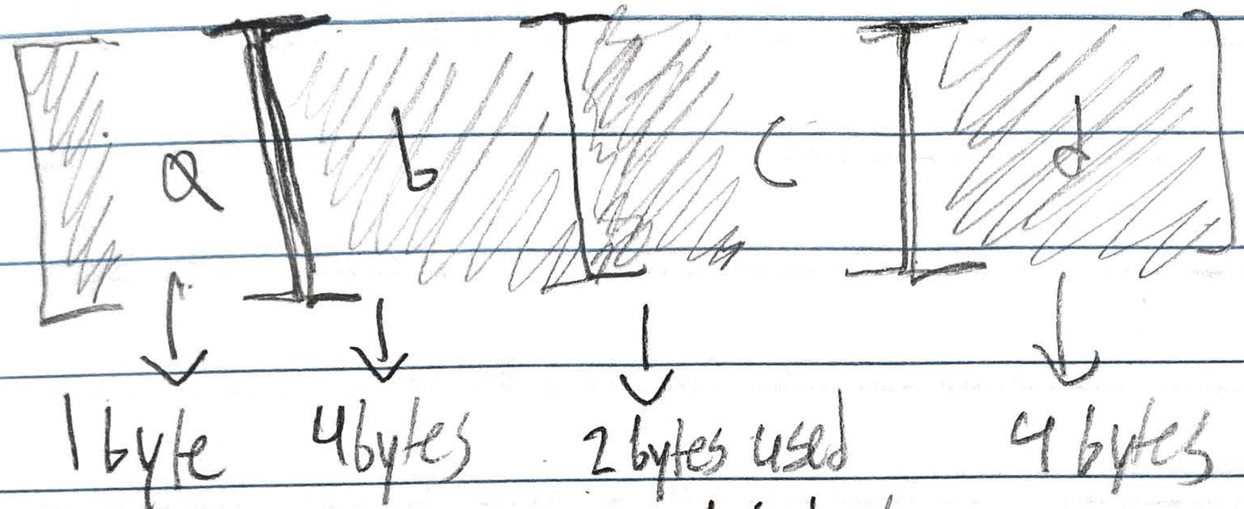
18. Assume you have files named:
    driver.c file.c file.h data.txt

    a. Write the command needed to tar zip the above files, naming the tarred file TarTest.tar.gz.
       tar -czvf TarTest.tar.gz driver.c file.c file.h data.txt

    b. Write the command needed to untar the TarTest.tar.gz file.
       tar -xzvf TarTest.tar.gz -C tempFolder(this is just an example on specifying the path for the files to go)

Did this because Word Formatting was weird

15.



total memory = 16 bytes