

Problem 1

1. Suppose the file `foo.txt` contains the text `"123456"`, `bar.txt` contains the text `"abcdef"`, and `baz.txt` does not yet exist. Examine the following C code, and answer the questions below. (For space reasons, we are not checking error return codes, so assume that all functions return normally.)

```
int main() {
    int fd1, fd2, fd3, fd4, fd5, fd6;
    int status;
    pid_t pid;
    char c;
    /* foo.txt has "123456" */
    fd1 = open("foo.txt", O_RDONLY, 0);
    fd2 = open("foo.txt", O_RDONLY, 0);
    /* bar.txt has "abcdef" */
    fd3 = open("bar.txt", O_RDWR, 0);
    fd4 = open("bar.txt", O_RDWR, 0);
    /* baz.txt doesn't exist initially */
    fd5 = open("baz.txt", O_WRONLY | O_CREAT | O_TRUNC, S_IRUSR |
              S_IWUSR); /* r/w */
    fd6 = dup(STDOUT_FILENO);
    dup2(fd5, STDOUT_FILENO);
    if ((pid = fork()) == 0) {
        dup2(fd3, fd2);
        read(fd3, &c, 1); printf("%c", c);
        write(fd4, "!@#$%^", 6);
        read(fd3, &c, 1); printf("%c", c);
        read(fd1, &c, 1); printf("%c", c);
        read(fd2, &c, 1); printf("%c\n", c);
        exit(0);
    }
    wait(NULL);
    read(fd1, &c, 1); printf("%c", c);
    fflush(stdout);
    dup2(fd6, STDOUT_FILENO);
    printf("done.\n");
    return 0;
}
```

1. What will the contents of `baz.txt` be after the program completes?
2. What will be printed on `stdout`?

Problem 2

Modify the cpfile program in Figure 10.4 in ICS book so that it uses the Rio functions to copy standard input to standard output, MAXBUF bytes at a time.

Problem 3

Problem 3: UNIX I/O .

What is the output of the following program?

```
#include "csapp.h"
int main()
{
    int fd1, fd2;
    fd1 = Open("foo.txt", O_RDONLY, 0);
    fd2 = Open("bar.txt", O_RDONLY, 0);
    Close(fd2);
    fd2 = Open("baz.txt", O_RDONLY, 0);
    printf("fd2 = %d\n", fd2);
    exit(0);
}
```

Problem 4

Write a program to implement the function "echo" just like function "echo" executed in Unix system.

```
#include <stdio.h>
#include <string.h>
int main(int argc, char *argv[]){
    if(argc == 1){
        printf("\n");
    }else{
        // your code here
    }
    return 0;
}
```