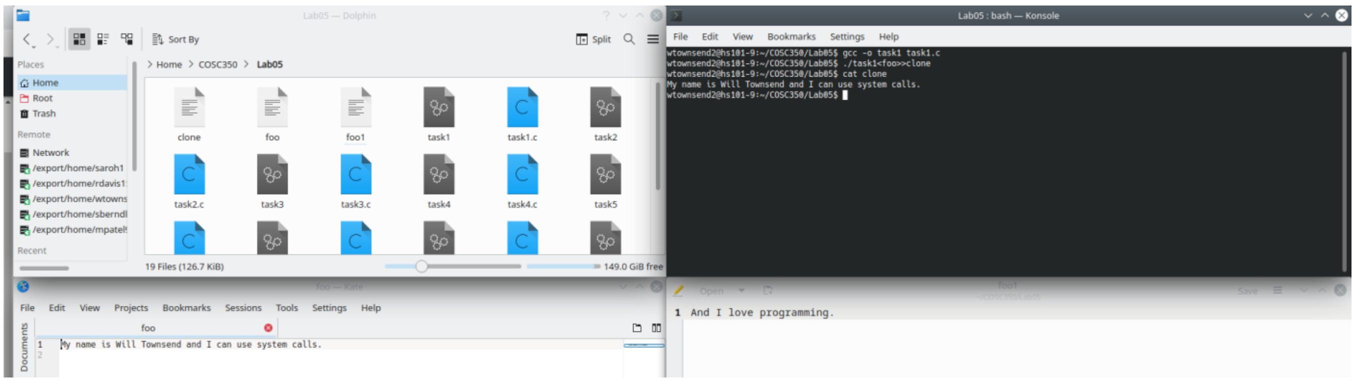
Task 1:



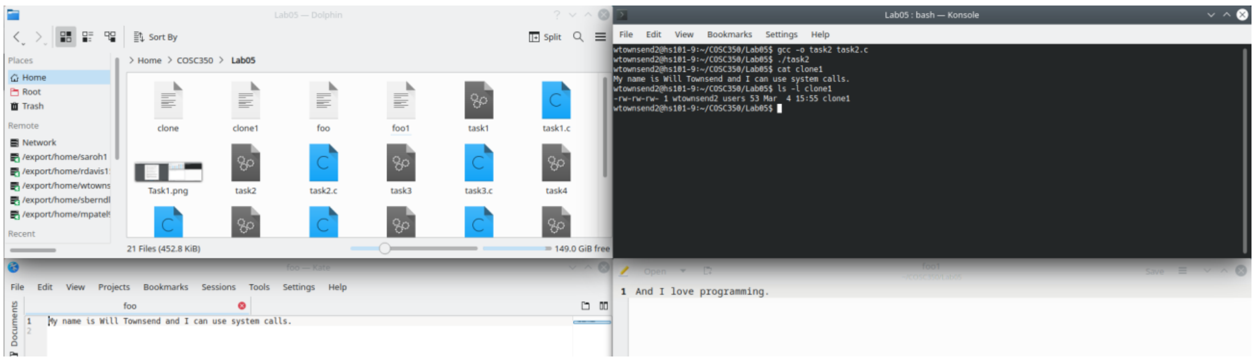
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task1 task1.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task1<foo>>clone
wtownsend2@hs101-9:~/COSC350/Lab05$ cat clone
My name is Will Townsend and I can use system calls.
wtownsend2@hs101-9:~/COSC350/Lab05$
```

```
My name is Will Townsend and I can use system calls.
```

```
And I love programming.
```

```
/*
* Lab 3 Task 1
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<unistd.h>
#include<fcntl.h>

int main(){
    char buffer[128];//128 byte buffer
    int bytes;//number of bytes read

    //loops through the standard (user) input 128 bytes at a time
    while ((bytes=read(0,buffer,128))>0){
        write(1,buffer,bytes); //writes the bytes to the standard output
    }
    exit(0);
}
```

Task 2:



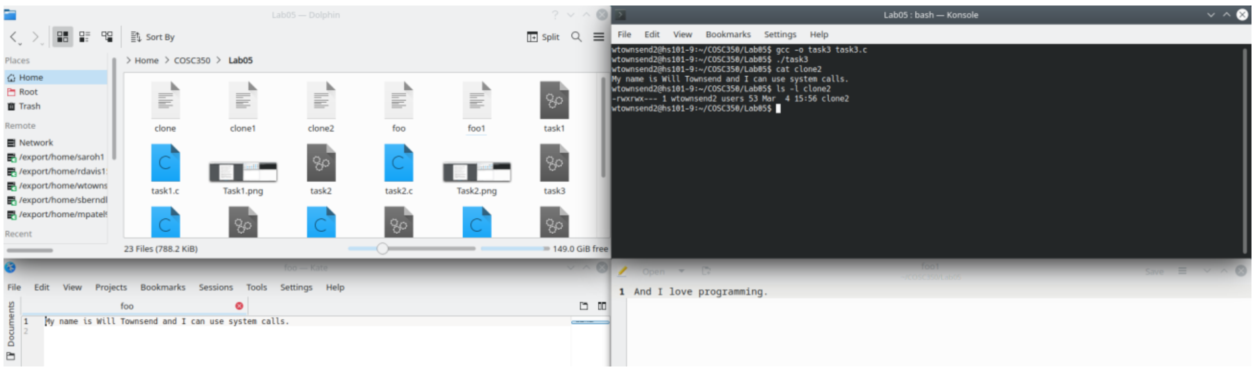
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task2 task2.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task2
wtownsend2@hs101-9:~/COSC350/Lab05$ cat clone1
My name is Will Townsend and I can use system calls.
wtownsend2@hs101-9:~/COSC350/Lab05$ ls -l clone1
-rw-rw-rw- 1 wtownsend2 users 53 Mar  4 15:55 clone1
wtownsend2@hs101-9:~/COSC350/Lab05$
```

```
My name is Will Townsend and I can use system calls.
```

```
And I love programming.
```

```c
/*
* Lab 3 Task 2
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<unistd.h>
#include<fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>

int main(){

   umask(000);//allows all permissions to be activated for usr, grp, or oth
   int fileIn=open("foo",O_RDONLY);//opens a file called foo w/read only permission
   int fileOut=open("clone1", O_CREAT | O_WRONLY,0666);//creates a file clone1 with rw-rw-rw permissions
   char b[1];//one byte buffer
   int rbyte;//number of bytes read

   //reads foo contents one byte at a time and writes them into clone1
   while((rbyte=read(fileIn,b,1)>0)){
      write(fileOut,b,rbyte);
   }

   //closes files opened
   close(fileIn);
   close(fileOut);
   exit(0);
}
```

Task 3:



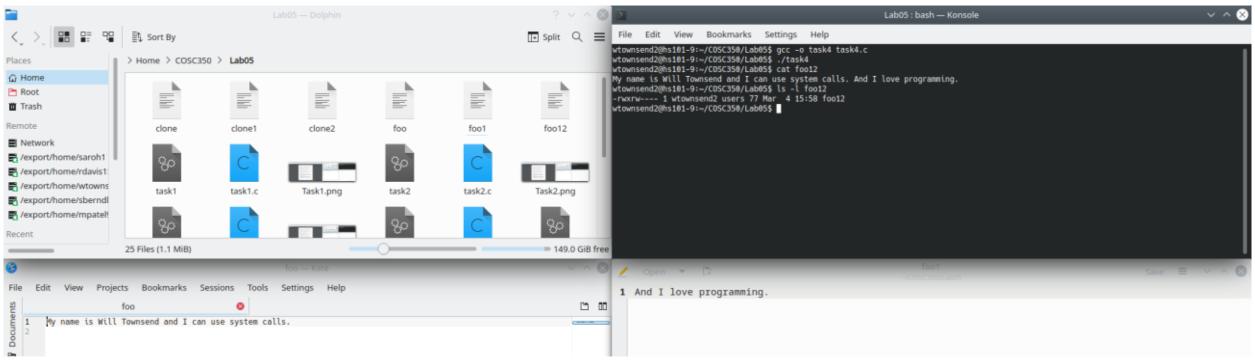
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task3 task3.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task3
wtownsend2@hs101-9:~/COSC350/Lab05$ cat clone2
My name is Will Townsend and I can use system calls.
wtownsend2@hs101-9:~/COSC350/Lab05$ ls -l clone2
-rwxrwx--- 1 wtownsend2 users 53 Mar  4 15:56 clone2
wtownsend2@hs101-9:~/COSC350/Lab05$ 
```

```
My name is Will Townsend and I can use system calls.
```

```
And I love programming.
```

```
/*
* Lab 3 Task 3
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<unistd.h>
#include<fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>

int main(){

   umask(000);//allows all permissions to be activated for usr, grp, or oth
   int fileIn=open("foo",O_RDONLY);//opens a file called foo w/read only permission
   int fileOut=open("clone2", O_CREAT | O_WRONLY,0770);//creates a file clone2 with
rwxrwx--- permissions
   char buffer[32];//32 byte buffer
   int rbyte;//number of bytes read

   //reads foo contents 32 bytes at a time and writes them into clone2
   while((rbyte=read(fileIn,buffer,32))>0){
      write(fileOut,buffer,rbyte);
   }

   //closes files opened
   close(fileIn);
   close(fileOut);
   exit(0);
}
```

Task 4:



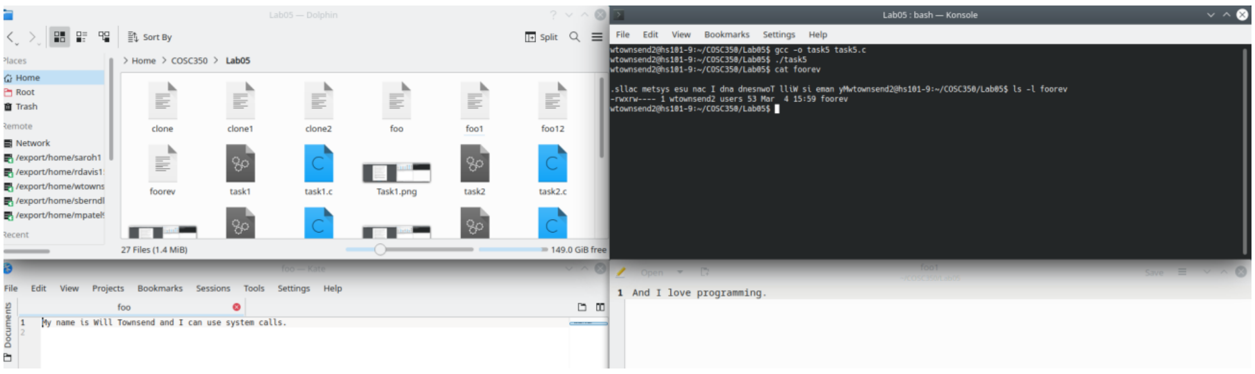
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task4 task4.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task4
wtownsend2@hs101-9:~/COSC350/Lab05$ cat foo12
My name is Will Townsend and I can use system calls. And I love programming.
wtownsend2@hs101-9:~/COSC350/Lab05$ ls -l foo12
-rwxrw---- 1 wtownsend2 users 77 Mar  4 15:58 foo12
wtownsend2@hs101-9:~/COSC350/Lab05$
```

```
1  My name is Will Townsend and I can use system calls.
2
```

```
1  And I love programming.
```

```
/*
* Lab 3 Task 4
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<unistd.h>
#include<fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>

int main(){

   umask(000);//allows all permissions to be activated for usr, grp, or oth
   int fileIn1=open("foo",O_RDONLY);//opens a file called foo w/read only permission
   int fileIn2=open("foo1",O_RDONLY);//opens a file called foo1 w/read only permission
   int fileOut=open("foo12", O_CREAT | O_RDWR,0760);//creates a file foo12 with rwxrw----
permissions
   char buffer[1024];//1024 byte buffer
   int rbyte;//number of bytes read

   //reads foo contents 1024 bytes at a time and writes them into foo12
   while((rbyte=read(fileIn1,buffer,1024))>0){
      write(fileOut,buffer,rbyte);
   }

   lseek(fileOut,0,SEEK_END);//sets the cursor/offset the end of foo12

   //reads foo1 contents 1024 bytes at a time and writes them into foo12
   while((rbyte=read(fileIn2,buffer,1024))>0){
      write(fileOut,buffer,rbyte);
   }

   //closes files opened
   close(fileIn1);
   close(fileIn2);
   close(fileOut);
   exit(0);
}
```

Task 5:



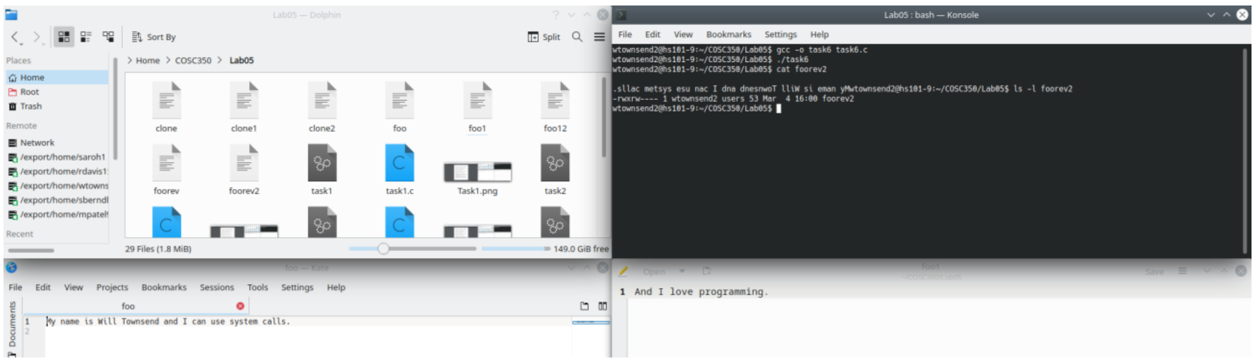
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task5 task5.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task5
wtownsend2@hs101-9:~/COSC350/Lab05$ cat foorev

.sllac metsys esu nac I dna dnesnwoT lliW si eman yMwtownsend2@hs101-9:~/COSC350/Lab05$ ls -l foorev
-rwxrw---- 1 wtownsend2 users 53 Mar  4 15:59 foorev
wtownsend2@hs101-9:~/COSC350/Lab05$
```

```
My name is Will Townsend and I can use system calls.
```

```
And I love programming.
```

```
/*
* Lab 3 Task 5
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<unistd.h>
#include<fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>

int main(){

   umask(000);//allows all permissions to be activated for usr, grp, or oth
   int fileIn=open("foo",O_RDONLY);//opens a file called foo w/read only permission
   int fileOut=open("foorev", O_CREAT | O_RDWR, 0760 );//creates a file foorev with rwxrw---- permissions
   char buffer[1];//one byte buffer
   int rbyte;//number of bytes read
   off_t offset=lseek(fileIn,0,SEEK_END)-1;//initial offset (cursor set to the end of the file)

   //reads through foo backwards
   while((rbyte=read(fileIn,buffer,1))>0){
      write(fileOut,buffer,rbyte);//write the current byte
      lseek(fileIn,offset--, SEEK_SET);//moves the cursor back a position
   }

   //closes files opened
   close(fileIn);
   close(fileOut);
   exit(0);
}
```

Task 6:



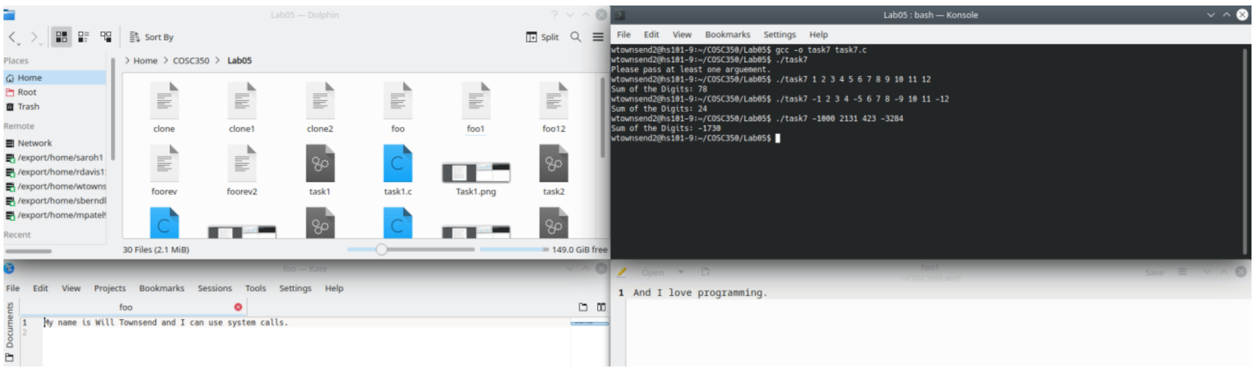
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task6 task6.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task6
wtownsend2@hs101-9:~/COSC350/Lab05$ cat foorev2

.sllac metsys esu nac I dna dnesnwoT lliW si eman yMwtownsend2@hs101-9:~/COSC350/Lab05$ ls -l foorev2
-rwxrw---- 1 wtownsend2 users 53 Mar  4 16:00 foorev2
wtownsend2@hs101-9:~/COSC350/Lab05$ 
```

```
My name is Will Townsend and I can use system calls.
```

```
And I love programming.
```

```
/*
* Lab 3 Task 6
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<stdio.h>
#include <sys/types.h>
#include <sys/stat.h>
#include<unistd.h>
#include<fcntl.h>

int main(){
    umask(000);//allows all permissions to be activated for usr, grp, or oth
    int fileIn=open("foo",O_RDONLY);//opens a file called foo w/read only permission
    int fileOut=open("foorev2", O_CREAT | O_RDWR, 0760 );//creates a file foorev2 with
rwxrw---- permissions
    char buffer[1];//one byte buffer
    int rbyte;//number of bytes read
    int i=0;//initializes the file size

    //determines the size of the file (to set the offset correctly)
    while((read(fileIn,buffer,1))>0)
        i++;

    //does the same as task 5 but uses pread to combine the lseek and read functions
    while((rbyte=pread(fileIn,buffer,1,--i))>0)
        write(fileOut,buffer,rbyte);

    //close files opened
    close(fileIn);
    close(fileOut);
    exit(0);
}
```

Task 7:



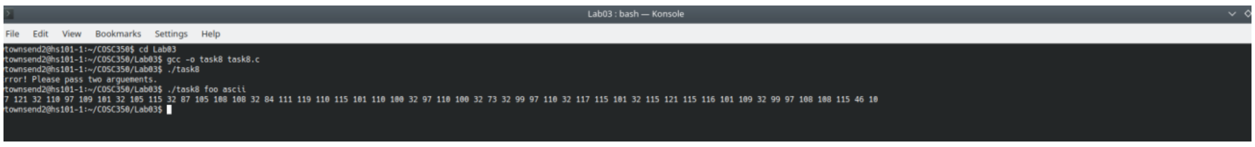
```
wtownsend2@hs101-9:~/COSC350/Lab05$ gcc -o task7 task7.c
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task7
Please pass at least one arguement.
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task7 1 2 3 4 5 6 7 8 9 10 11 12
Sum of the Digits: 78
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task7 -1 2 3 4 -5 6 7 8 -9 10 11 -12
Sum of the Digits: 24
wtownsend2@hs101-9:~/COSC350/Lab05$ ./task7 -1000 2131 423 -3284
Sum of the Digits: -1730
wtownsend2@hs101-9:~/COSC350/Lab05$ 
```

```
My name is Will Townsend and I can use system calls.
```

```
And I love programming.
```

```
/*
* Lab 3 Task 7
* COSC 350
* Will Townsend
*/
#include<stdlib.h>
#include<stdio.h>
#include<unistd.h>
#include<fcntl.h>

//function to convert a string of digits into an int
int strToInt(char str[]){
    int i=0;//increment variable (for loop)
    int sign=0;//used check sign case
    int num=0;//final number to be returned

    //checks if number is negative, adjusts sign variable accordingly
    if(str[0]=='-')
        sign=-1;
    //adds one to the increment variable to ignore
    if(sign==-1)
        i++;

    //loops through the digits converting each into their digit equivalent
    /*
     * Given a char arr '123' the loops is as follow:
     * 0*10+'1'-'\0'=1 => 1*10+'2'-'\0'=12 => 12*10+'3'-'\0'= 123
     * This loop works for any set of digits in a character array.
    */
    for(i;str[i]!='\0';i++)
        num=num*10 + str[i] - '0';
    //fixes num if '-' was found earlier
    if(sign==-1)
        num=-num;
    //returns the final converted number
    return num;
}

int main(int argc,char *argv[]){
    //error checks the parameters (makes sure there is at leat one integer)
    if(argc<2){
        printf("Please pass at least one arguement.\n");
        exit(1);
    }
    int sum=0;//initializes the sum
    //loops through all the arguements, converts them to integers, and adds them up
    for(int i=1;i<argc;i++)
        sum+=strToInt(argv[i]);
    printf("Sum of the Digits: %d\n", sum);//prints the sum of numbers
    exit(0);
}
```

Task 8:



```
townsend2@hs101-1:~/COSC350$ cd Lab03
townsend2@hs101-1:~/COSC350/Lab03$ gcc -o task8 task8.c
townsend2@hs101-1:~/COSC350/Lab03$ ./task8
rror! Please pass two arguements.
townsend2@hs101-1:~/COSC350/Lab03$ ./task8 foo ascii
7 121 32 110 97 109 101 32 105 115 32 87 105 108 108 32 84 111 119 110 115 101 110 100 32 97 110 100 32 73 32 99 97 110 32 117 115 101 32 115 121 115 116 101 109 32 99 97 108 108 115 46 10
townsend2@hs101-1:~/COSC350/Lab03$ 
```

```
#include<stdlib.h>
#include<stdio.h>
#include<unistd.h>
#include<fcntl.h>
#include <sys/types.h>
#include <sys/stat.h>

int main(int argc,char *argv[]){
    //error checks the arguements
    if(argc!=3){
        write(2,"Error! Please pass two arguements.\n",36);
        exit(2);
    }

    umask(000);//allows permissions to be set to any for usr, grp, oth
    int fileIn=open(argv[1],O_RDONLY);//opens input file determined by the first arguement
    int fileOut=open(argv[2],O_CREAT | O_RDWR, 0666);//creates the output file (name
determined by second command line arguement

    //error check for files
    if(fileIn==-1 || fileOut==-1){
        write(2,"Error! Cannot open file.\n",26);
        exit(1);
    }

    char b;//singular byte
    int rbyte;//readbytes

    //reading contents of the file
    while((rbyte=read(fileIn,&b,1)>0)){
        int num = (int) b;//conversion of char into an int (ascii form)
        write(fileOut,&num,rbyte);//writes into the file the ascii equivalent (ERROR! does not give
desired output)
        printf("%d ",num);//tests the actual conversion
    }
    puts("");

    //closes the open files
    close(fileIn);
    close(fileOut);
    exit(0);
}
```