## Worksheet 16 - IO

### solution

**Exercise 1.**

Write a program that searches a word in the input text file and prints out the corresponding line with its line number. To search a word in a line, you can use the “strstr” function (<http://www.cplusplus.com/reference/cstring/strstr/>) in string.h. Assume the length of each line does not exceed the predefined buffer size.

Example:

“input.txt”

*Together with ECE120, which you should have already taken, this course gives an introduction to the design and programming of computing systems.*

*This course will focus on C programming, where each new C concept will be related to the fundamental concepts described in ECE120.*

*We will start by finishing our coverage of low-level concepts such as I/O, subroutines, and stacks in LC-3 assembly language, then move on to C.*

*We will cover basic programming concepts, functions, arrays, pointers, I/O, recursion, simple data structures, and concepts in object-oriented programming.*

*A bottom-up understanding of computing systems has proven more successful in helping students to understand advanced concepts in computing that follow in the ECE curriculum.*

*Again, this course requires that you take ECE120 first.*

*Concurrent enrollment is not acceptable.*

*If you have not met this requirement but think that you should still enroll, speak with the instructor.*

Input file name: input.txt

Search: 120

Found "120" in line number 1: Together with ECE120, which you should have already taken, this course gives an introduction to the design and programming of computing systems.

Found "120" in line number 2: This course will focus on C programming, where each new C concept will be related to the fundamental concepts described in ECE120.

Found "120" in line number 6: Again, this course requires that you take ECE120 first.

#include <stdio.h>

#include <string.h>

#define BUF 200

int main(){

FILE \*fp;

char filename[BUF], word[BUF], line[BUF];

int linenum=0;

printf("Input file name: ");

scanf("%s", filename);

if( (fp=fopen(filename, "r")) == NULL){

printf("Cannot open %s.\n", filename);

return 1;

}

printf("Search: ");

scanf("%s", word);

while(fgets(line, BUF, fp)){

linenum++;

if(strstr(line, word) != NULL)

printf("Found \"%s\" in line number %d: %s\n", word, linenum, line);

}

fclose(fp);

return 0;

}

**Exercise 2.**

Modify the above program to search and replace words. The program reads a source file and outputs a new file after replacing the given word. The program replaces the first occurrence of the word in a line.

Example:

“input.txt”

*The rose is a rose,*

*And was always a rose.*

“onput.txt”

*The lily is a rose,*

*And was always a lily.*

Enter the input file name: input.txt

Enter the output file name: output.txt

search: rose

replace: lily

int main(){

FILE \*fpin, \*fpout;

char srcname[BUF], desname[BUF], word[BUF], line[BUF], rep[BUF], newstr[BUF];

char \*ptr;

int len;

printf("Enter the input file name: ");

scanf("%s", srcname);

if( (fpin=fopen(srcname, "r")) == NULL){

printf("Cannot open %s.\n", srcname);

return 1;

}

printf("Enter the output file name: ");

scanf("%s", desname);

if( (fpout=fopen(desname, "w")) == NULL){

printf("Cannot open %s.\n", desname);

return 1;

}

printf("search: ");

scanf("%s", word);

len = strlen(word);

printf("replace: ");

scanf("%s", rep);

while(fgets(line, BUF, fpin)){

if( (ptr=strstr(line, word)) != NULL){

\*newstr = '\0';

strcpy(newstr, rep);

strcat(newstr, ptr+len);

strcpy(ptr, newstr);

}

fprintf(fpout, "%s", line);

}

fclose(fpin);

fclose(fpout);

return 0;

}