1) write a c function to count the number of characters in a string

#include <stdio.h>

int count\_chars(char\* str) {

int count = 0;

while (\*str != '\0') {

count++;

str++;

}

return count;

}

int main() {

char str[] = "Hello, world!";

int count = count\_chars(str);

printf("The number of characters in the string is: %d", count);

return 0;

}

2) Prime numbers can also be generated by an algorithm known as the Sieve of Eratosthenes. The algorithm for this procedure is presented here. Write a program that implements this algorithm. Have the program find all prime numbers up to n = 150?

#include <stdio.h>

#include <stdlib.h>

#include <stdbool.h>

#define MAX\_NUM 150

int main()

{

bool is\_prime[MAX\_NUM + 1];

int i, j;

// initialize all numbers as prime

for (i = 2; i <= MAX\_NUM; i++) {

is\_prime[i] = true;

}

// mark multiples of prime numbers as not prime

for (i = 2; i \* i <= MAX\_NUM; i++) {

if (is\_prime[i]) {

for (j = i \* i; j <= MAX\_NUM; j += i) {

is\_prime[j] = false;

}

}

}

// print out all prime numbers up to MAX\_NUM

printf("Prime numbers up to %d:\n", MAX\_NUM);

for (i = 2; i <= MAX\_NUM; i++) {

if (is\_prime[i]) {

printf("%d ", i);

}

}

return 0;

}