CENG 2001 – C Programming - Fall 2020
Take Home Midterm Exam

3 Questions (100 pts total)

Deadline: 14/12/2020 13:00

Submission Rules:

- **Write all your solutions as handwritten on to a set of A4 papers.**
- **Write "CENG 2001 – C Programming – Fall 2020 – Take Home Midterm Exam" at the beginning of your answer sheet**
- **Write your name, student id and signature at each page!**
- **Scan your handwritten answers by a scanner or a camera**
- **Convert them to a single PDF file**

1. **(30 Pts)** Write a program that lists prime numbers that a given number is divisible by. The number is get by the user as input.
   Examples:
   Input: 15, Output: 3,5
   Input: 12, Output: 2,3
   Input: 32, Output: 2
   Input: 17, Output: 17
   Input: 780, Output: 2,3,5,13

Hints:

1. Prime number is a positive number that is divisible by only 1 and itself. (e.g., 2, 3, 17,19).
4. Assume that there will be at most 20 prime numbers to list in the output.

2. **(50 Pts)** Write a **function** to check if a Turkish Identity number is valid or not. There are a few mechanisms to check if the identity number is valid.
   a. It has 11 digits
   b. It does not start with 0
   c. Remainder of the sum of first 10 digits after dividing by 10 gives the 11. digit
   d. (There is another rule, but you can ignore it for now)

   The function will take a string as argument and will return 1 if it is valid and 0 if it is invalid. It has to check all three rules (a,b,c) and must return 1 only it satisfies all three rules.

   Example: Turkish Identity Number of Mustafa Kemal Atatürk
   10000000146
   - It has 11 digits ✓
   - It does not start with 0 ✓
   - (1 + 0 + 0 + 0 + 0 + 0 + 0 + 0 + 1 + 4) %10 = 6 and it is equal to 11. Digit ✓

   The function returns 1

   Do not write the main program. Create a function only but with proper function definition, return values.

Name: Mehmet Akif KÖZ Signature: Akif

Student ID: 192010010023

3. (**20 Pts**) Write a program that takes a string from the user as input and finds the number of occurrences of "the" in the string. It displays the number of occurrences as output.
Example: The most interesting words that include the are therapeutically, openmouthed, theory, etherealization, mathematical.
Output: 7

(1)

```
# include <stdio.h>

int checkPrime(int number);

void main()
{
    int input;
    printf("Input: ");
    scanf("%d", &input);

    printf("Output: ");
    for(int i=2; i<=input; i++)
    {
       if (input % i ==0 && checkPrime(i)==1)
       {
          printf("%d ", i);
       }
    }
}
```

// THIS PROGRAM CONTINUES ON PAGE 3.

Name: Mehmet Akif KÖZ Signature: Akif

Student ID: 192010010023

CENG2001 - C Programming - Fall 2020 - Take Home Midterm Exam

Name: Mehmet Akif KÖZ Signature: Akif

Student ID: 192010010023

①

```
int checkPrime(int number) {
    for(int i=2; i<number; i++) {
        if(number==2) {
            return 1;
            // True
        }
        else if (number%i==0) {
            return 0;
            // False
        }
        else {
            continue;
        }
    }
    return 1;
    //True
}
```

CENG2001 - C Programming - Fall 2020 - Take Home

Midterm Exam

Name: Mehmet Akif KÖZ Signature: Akif

Student ID: 192010010023

(2)

```
#include <stdio.h>
#include <string.h>

int checkIdentityNumber (char *id)
{
    int len = strlen(id);
    int sum;

for(int i=0; i<len-1; i++)
    sum += id[i] - 48;

if (len != 11)
   return 0; // Invalid
else if (id[0] = '0')
   return 0; // Invalid
else if (sum % 10 != id[10] - 48)
    return 0; //Invalid
   else
    return 1; // Valid
}
// I DIDN'T USE CURLY BRACES TO FIT IT.
```

CENG2001 - C Programming - Fall 2020 - Take Home

Midterm Exam

Name: Mehmet Akif KÖZ Signature: Akif

Student ID: 192010010023

(3)

```
#include <stdio.h>

void main()
{
    char string[250];
    gets(string);
    int i=0, j=1, k=2;
    int count=0;
    while(string[i] != '\0')
    {
        if((string[i]=='t' || string[i]=='T') &&
           (string[j]=='h' || string[j]=='H') &&
           (string[k]=='e' || string[k]=='E'))
           count++;
        i++;
        j++;
        k++;
    }
    printf("%d \n", count);
}
```