CSE 102 Spring 2024 – Computer Programming Assignment 5

Due on April 03, 2024 at 23:59

Turkey's first astronaut Alper Gezeravcı completed his 2-week space mission. Within the scope of the "First Manned Space Mission", which is the first step of the National Space Programme, Gezeravcı carried out a total of 13 different experiments during his mission on the International Space Station. The sensitive data required for the experiments conducted under the coordination of TÜBİTAK UZAY, Axiom Space and NASA were transmitted in encrypted form. The 4 different keys required to decrypt these ciphers were hidden in 4 different news texts published in different news sources, which were transmitted to Gezeravcı daily during the mission. We want to develop a programme to find the keys obtained from the magic numbers hidden in the news texts.

Please note that the main function of this program will consist only of calling the menu () function.

Part 1. [30pts]

Every day, 4 news texts containing reliable and magic numbers selected from thousands of news about space missions are sent to Alper Gezeravcı by the Ministry of Industry and Technology of the Republic of Turkey. (The selected news of the day is included in the news folder.) The first line of the news texts always includes the title of the news. The other lines are the content of the news text. Information about what you need to do in this part of the task is presented below:

1. Produce the following output, listing only the headlines of the news texts.

```
**********Daily Press**************

Today's news are listed for you :

Title of 1. news:Astronot Alper Gezeravcı'nın Dünya'ya dönüşü ertelendi
Title of 2. news:Bakan Kacır, Astronot Gezeravcı ile Videokonferans Görüşmesi Gerçekleştirdi
Title of 3. news:Alper Gezeravcı uzayda 9. deneyini yaptı
Title of 4. news:Astronotların uzaydaki ilk sözleri

What do you want to do?
a.Read a new
b.List the readed news
c.Get decrypted information from the news
```

2. Present the menu with the actions that can be performed to the user.

3. If the user selects 'a', ask which news text he/she wants to read and then print the full news text on the screen depending on this selection.

4. After displaying any news text, ask the user if he/she wants to continue reading a different news item. If he/she wants to continue, display a menu, otherwise end the programme.

```
What do you want to do?
a.Read a new
b.List the readed news
c.Get decrypted information from the news
b

Readed news are listed below:
1. new is readed
4. new is readed
Do you want to continue? Yes(y)/No(n):
n
Good Bye!
```

Assume that the maximum text size in text files is 500 characters.

You should perform all selection operations in a menu() function, but you should design separate functions for all other operations that need to be done based on these selections.

Part 2. [40pts]

We also expect this program to keep a record of previously read news items. You will need to use this information in both option 'a' and option 'b'.

Remember this! When we end the program and start it again, if that news item has already been read, it should still be kept up to date!

If the user wants to read a news item that has already been read in option 'a', the message 'This news item has already been read. Would you like to read it again?" message. If the reader wants to read that news item again, you should display the entire news item on the screen again. If the reader does not want to read it, you should ask the question "Would you like to continue reading a different news item?". If he/she wants to continue, you should show the start screen on the screen again. If he/she does not want to continue, you can end the program with the message 'Goodbye!'.

```
What do you want to do?
a.Read a new
b.List the readed news
c.Get decrypted information from the news
a
Which news do you want to read?:1
This new is readed. Do you want to read again? Yes(1) / No(0):
```

If the user chooses the option 'b', you should print the list of news read this time on the screen as shown in the image below.

```
What do you want to do?
a.Read a new
b.List the readed news
c.Get decrypted information from the news
b

Readed news are listed below:
2. new is readed
1. new is readed
3. new is readed
Do you want to continue? Yes(y)/No(n):
```

When the program is opened and closed, it should be kept in a file such as a database, so that the information of the readers are not lost.

When the reader reads the news and wants to read it at different times, you should make sure that it is not added once again to the news list read.

Part 3. [30pts]

In each news text, there is a '#' sign placed at random points and a number next to it. These numbers are your magic numbers. Your magic numbers will allow you to discover their key values (secret number) through the formulae below.

$$X_i : magic\ numbers\ (0 < X_i < 10)$$
$$n: the\ number\ of\ magic\ numbers. (0 < n < 10)$$

Let $f(x) = x^3 - x^2 + 2$ and $g(x) = x^2$, $secret\ number = \sum_1^n g(f(X_i))$

```
What do you want to do?
a.Read a new
b.List the readed news
c.Get decrypted information from the news
c
Which news would you like to decrypt?:2
Bakan Kacır, Astronot Gezeravcı ile Videokonferans Görüşmesi Gerçekleştirdi

Sa#4nayi ve Teknoloji Bakanı Sayın Me#7hmet Fatih Kacır'ın, Uluslararası Uzay İstasyonu'nda g#9örevini sürdüren Türkiye'nin il#5k astronotu Alper Gezeravcı
ile videokonferans aracılığıyla görüştü#8ğü canlı bağlantıyı Vali Mahmut De#6mirtaş, Bursa halkı ile birlikte izle#9di.


Second Experiment Key = 1181144.00
```

Please note! The experiment key in the screenshot does not have to be correct, please make sure that you write a code that will correctly calculate the experiment key stored in each news text with the calculation method described above!

IMPORTANT NOTES:

- Submit your homework as a zip file named as your student id (StudentID.zip) and this file should include:
  - YourStudentID.c file
  - YourStudentID.pdf file which includes a YouTube link, screenshots of your generated outputs and given C code as an input. In this video you need to show your work and explain it. It must be 4 minute maximum. If it exceeds, you will lose points. Please open your camera as well.
- The output format must be as given, do not change it.
- Compile your work with given command “gcc --ansi your_program.c -o your_program”.
- Your work will be evaluated using gcc version 11.4.0.
- For any questions and problems, you can always contact me **via email** (bbuluz@gtu.edu.tr), or you can find me in Room 215 during scheduled office hours on March 22 and March 27, 2024, between 13:00 and 14:00.