CSc 3320: Systems Programming

Spring 2021

Homework

4: Total points 100

Submission instructions:

1. Create a Google doc for each homework assignment submission.
2. Start your responses from page 2 of the document and copy these instructions on page 1.
3. Fill in your name, campus ID and panther # in the fields provided. If this information is missing in your document TWO POINTS WILL BE DEDUCTED per submission.
4. Keep this page 1 intact on all your submissions. If this *submissions instructions* page is missing in your submission TWO POINTS WILL BE DEDUCTED per submission.
5. Each homework will typically have 2-3 PARTS, where each PART focuses on specific topic(s).
6. Start your responses to each PART on a new page.
7. If you are being asked to write code copy the code into a separate txt file and submit that as well.
8. If you are being asked to test code or run specific commands or scripts, provide the evidence of your outputs through a screenshot and copy the same into the document.
9. Upon completion, download a .PDF version of the document and submit the same.

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Part 1

1)

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

void checkPassword(char*);

void main()
{
    // Get user input
    char password[20];
    printf("Enter password: ");
    scanf("%s", &password);

    checkPassword(password);
}

void checkPassword(char *password)
{
    // Get number of characters in password
    int len = strlen(password);
    int points = 0;

    // Determine how many points to deduct
    if (len < 10) {
        points = points + (10 - len) * 5;
    }

    // Print corresponding message
    if (points > 30) {
        printf("The password is unsafe! Please reset.");
    }
    else {
        printf("The password is safe.");
    }

}
```

```
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./checkPasswd
Enter password: pas
The password is unsafe! Please reset.[pofremu1@gsuad.gsu.edu@snowball hw3]$
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./checkPasswd
Enter password: password
[pofremu1@gsuad.gsu.edu@snowball hw3]$
```

2)

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

void checkPassword(char*);

void main()
{
    // Get user input
    char password[20];
    printf("Enter password: ");
    scanf("%s", &password);

    checkPassword(password);
}

void checkPassword(char *password)
{
    // Get number of characters in password
    int len = strlen(password);

    // Flags
    int lowercase = 0;    // Lowercase letter
    int capital = 0;     // Capital letter
    int num = 0;         // Number
    int cchars = 0;      // More than 2 consecutive characters

    // Check password
    int i;
    for (i = 0; i < len; i++) {
        char ch = password[i];

        // Check if lowercase letter
        if (ch >= 'a' && ch <= 'z') {
            lowercase = 1;
        }

        // Check if capital letter
        else if (ch >= 'A' && ch <= 'Z') {
```

```
            capital = 1;
        }

        // Check if number
        else if ( ch >= '0' && ch <= '9' ) {
            num = 1;
        }

        // Check for more than 2 consecutive chars
        if (password[i-1] && password[i-2]) {
            cchars = 1;
        }

    }

    int points = 0;
    // Calculate point deduction
    if (lowercase == 0) points += 20;
    if (capital == 0) points += 20;
    if (num == 0) points += 20;
    if (cchars == 1) points += 20;

    // Print corresponding message
    if (points > 30) {
        printf("unsafe");
    }
    else {
        printf("safe");
    }

}
```

```
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./checkPasswd
Enter password: pWd2
safe
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./checkPasswd
Enter password: dgferg4
unsafe
[pofremu1@gsuad.gsu.edu@snowball hw3]$
```

Part 2

3)

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

int palindrome(char*, int);

void main() {
    // Read messagge
    char string[30];
    printf("Enter message: ");
    fgets(string, 30, stdin);

    // Check if message is palindrome
    int res = palindrome(string, strlen(string));

    if (res == 1) {
        printf("Is palindrome \n");
    } else {
        printf("Not palindrome \n");
    }

}

int palindrome(char *string, int len) {
    // Pointer to first and last characters in message
    int left = 0;
    int right = len-2;

    // Check if both characters are the same and then move towards center
    while(left <= right) {
        while (string[left] == ' ' || string[right] == ' ') {
            if (string[left] == ' ') left++;
            if (string[right] == ' ') right--;
        }
        if (string[left++] != string[right--]) {
            // If characters are not the same message is not a palindrome
            return 0;
        }
    }
```

```
    return 1;
}
```

```
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./palindrome
Enter message: Some men interpret fine memos
Not palindrome
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./palindrome
Enter message: racecar
Is palindrome
[pofremu1@gsuad.gsu.edu@snowball hw3]$
```

4)

```c
# include <stdio.h>

void swap(char*, char*);
int isNum(int);

void main()
{
    // Initialize space for sentences
    char messageOne[20];
    char messageTwo[20];

    // Get sentence one
    printf("Enter a message: ");
    scanf("%s", &messageOne);

    // Get sentence two
    printf("Enter a message: ");
    scanf("%s", &messageTwo);

    // Iterate through both sentences and swap numbers and letters
    int i = 0;
    while (i <= 20) {
        // Current character
        int ch1 = messageOne[i];
        int ch2 = messageTwo[i];

        // If character one is a letter and character two is a number swap
them
        if (isNum(ch1) == 0 && isNum(ch2) == 1){
            swap(&messageOne[i], &messageTwo[i]);
        }

        // If character one is a number and character two is a letter swap
them
```

```
        else if (isNum(ch1) == 1 && isNum(ch2) == 0) {
            swap(&messageOne[i], &messageTwo[i]);
        }

        // Move to next character
        i++;
    }

    // Print sentences
    printf("Sentence one: %s \n", messageOne);
    printf("Sentence two: %s \n", messageTwo);

}


void swap(char* ch1, char* ch2)
{
    // Arithmetic swap two variables
    *ch1 = *ch1 + *ch2;
    *ch2 = *ch1 - *ch2;
    *ch1 = *ch1 - *ch2;
}


// Check if character number or letter
int isNum(int ch)
{
    // Check if character is lowercase letter
    if ('a' <= ch && ch <= 'z') {
        return 0;
    }

    // Check if character is lowercase letter
    else if ('A' <= ch && ch <= 'Z') {
        return 0;
    }

    // Check if character is lowercase letter
    else if ('0' <= ch && ch <= '9') {
        return 1;
```

```
    }


    return -1;
}
```

```
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./swapNumLetters
Enter a message: 457EJR
Enter a message: FMB204
Sentence one: FMB204
Sentence two: 457EJR
[pofremu1@gsuad.gsu.edu@snowball hw3]$
```

5)

```c
#include <stdio.h>

void findCountry(int);

// Create dialing code struct
struct dialing_code {
  char *country;
  int code;
};

// Create array of dialing codes
const struct dialing_code country_codes[] =
  {{"Argentina",            54}, {"Bangladesh",      880},
   {"Brazil",               55}, {"Burma (Myanmar)",  95},
   {"Czech Republic",      420}, {"China",            86},
   {"Colombia",             57}, {"Norway",           47},
   {"Congo, Dem. Rep. of", 243}, {"Egypt",            20},
   {"Ethiopia",            251}, {"Estonia",         372},
   {"France",               33}, {"Iceland",         354},
   {"Germany",              49}, {"India",            91},
   {"Indonesia",            62}, {"Iran",             98},
   {"Italy",                39}, {"Japan",            81},
   {"Mexico",               52}, {"Nigeria",         234},
   {"Pakistan",             92}, {"Philippines",      63},
   {"Poland",               48}, {"Russia",            7},
   {"South Africa",         27}, {"South Korea",      82},
   {"Spain",                34}, {"Sudan",           249},
   {"Thailand",             66}, {"Turkey",           90},
   {"Ukraine",             380}, {"United Kingdom",   44},
   {"United States",         1}, {"Vietnam",          84}};

void main()
{
    // Get code from user
    int code;
    printf("Enter dialing code: ");
    scanf("%d", &code);

    findCountry(code);
```

```
}

void findCountry(int code)
{
    // Iterate through every countries code and check if there is a match
    int i;
    for (i = 0; i < 28; i++)
        // If code match is found
        if (code == country_codes[i].code) {
            printf("Dialing code: %d --> %s\n", code,
country_codes[i].country);
            return;
        }
    // If code not found
    printf("No country found\n");
}
```

```
[pofremu1@gsuad.gsu.edu@snowball hw3]$ ./findCountry
Enter dialing code: 7
The country with dialing code 7 is Russia
[pofremu1@gsuad.gsu.edu@snowball hw3]$
```