Programming Assignment 1

Computer Programming for Engineers (DASF003-41)

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Introduction

- **Deadline : 2021.10.13**

- **You have two days for late submission (~2020.15)**
  - **25%** deduction per day

- **Submit both source code and Makefile**
  - You will not get a point if your makefile do not build an executable program

Problem 1 (20pt)

■Description

1. Receive 10 numbers from users and store them into an array
2. Manipulate the array in a way that it stores all the odd number first (ascending order), and then even numbers (descending order)
3. Prints all the elements in the array.

■Restriction

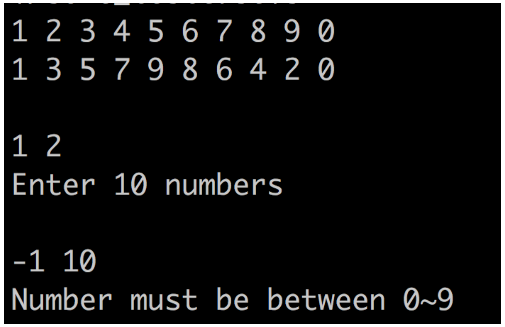
A. Input number must be between 0~9

B. Use range-based for loop when you are iterating the array

- -10 points if you do not use range-based for loop
- -5 points if you do not limit the range of input numbers (only 0-9 are acceptable)

Problem 1

Output Example



```
1 2 3 4 5 6 7 8 9 0
1 3 5 7 9 8 6 4 2 0

1 2
Enter 10 numbers

-1 10
Number must be between 0~9
```

Submission Files

- main.cc
- arrayModify.cc
- arrayModify.h
- Makefile
- -10 points if change the template code

Problem 2 (30pt)

■Description

1. Arabians write letters right to left except numbers
2. Arabinglish is a fake language that writes English in Arabian style
3. Implement a translator that inputs English and outputs Arabinglish
4. Input: An English sentence that less than 100 characters
5. Output: Arabinglish sentence

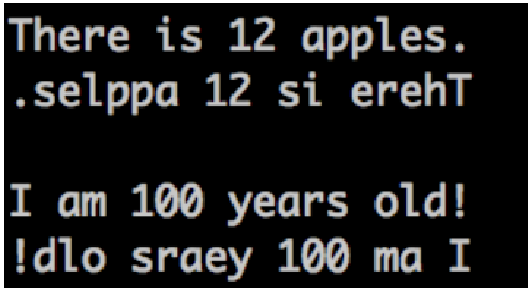
■Restriction

A. Use String class not C-String

- -10 points if you use C-String

Problem 2

Output Example



```
There is 12 apples.
.selppa 12 si erehT

I am 100 years old!
!dlo sraey 100 ma I
```

Submission Files

- main.cc
- arabians.cc
- arabians.h
- display.cc
- display.h
- Makefile
- -10 points if you change the template code

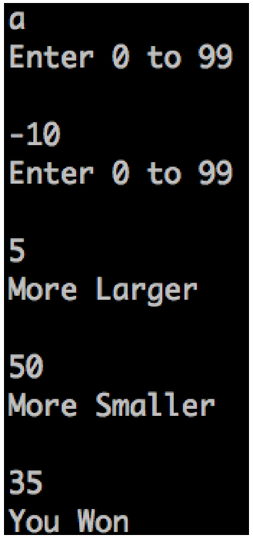
Problem 3 (10pt)

■ Description :

1. Develop a simple game program
2. The program generates random number from 0 to 99
3. User will guess this number by providing the guess through stdin
4. If user enters correct target number, program prints “You Won”
5. If user’s guess number is larger than the target number, program prints “More Smaller”
6. If user’s guess number is smaller than the target number, program prints “More Larger”
7. Game goes until the user finds right target number
8. If user enters input other than 0 to 99, program prints “Enter 0 to 99”
9. For random number generation, use rand() function
   - https://en.cppreference.com/w/cpp/numeric/random/rand

Problem 3

Output Example



```
a
Enter 0 to 99

-10
Enter 0 to 99

5
More Larger

50
More Smaller

35
You Won
```

Submission Files

- main.cc
- guess.cc
- guess.h
- Makefile
- -10 points if you change the template code

Problem 4 (40pt)

■Description

1. The file words.txt contains approximately 300 words
2. Program reads each word from the file
3. Program outputs the word that has the most pairs of consecutive double letters
4. For example, the word “tooth” has one pair of double letters, and the word “committee” has three pairs of consecutive double letters.

Problem 4

Submission Files

- main.cc
- wordProcess.cc
- wordPorceds.h
- Makefile
- -10 points if you change the template code

Additional Material

Makefile

- Please reference the week 5's lecture note
- https://makefiletutorial.com

Install Linux (Ubuntu) on virtualbox

- You can use any other environment like Mac, WSL or VMWare
- As long as you can compile and execute program using makefile, any environment is fine
- Korean installation guide
  - https://mainia.tistory.com/2379
- English installation guide
  - https://www.wikihow.com/Install-Ubuntu-on-VirtualBox

Basic Linux command

- https://maker.pro/linux/tutorial/basic-linux-commands-for-beginners

Basic Vim Editor Usage (Non-Essential)

- https://opensource.com/article/19/3/getting-started-vim

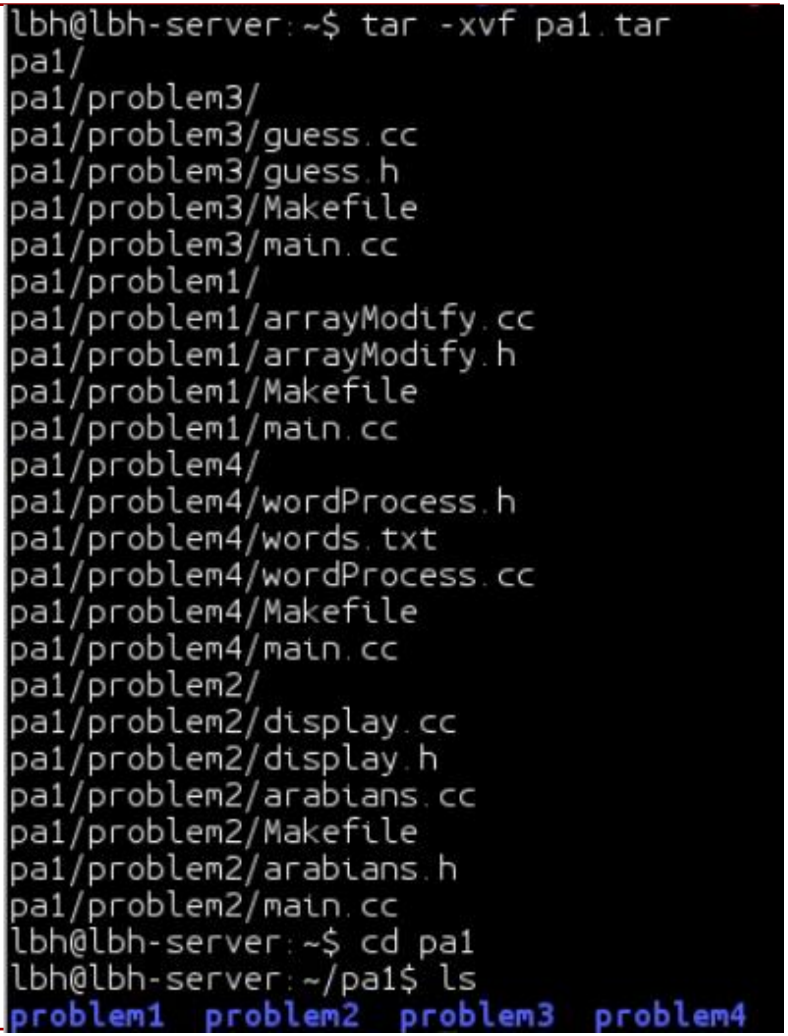
Prerequisites & PA Start Guide

- **Install Make and g++**
  - $ sudo apt-get install build-essential
  - $ sudo apt install g++
  - $ sudo apt-get install vim

- **Unzip tar file**
  - $ tar –xvf pa1.tar

- **Check the files in directory *pa1***
  - $ ls

- **Use Vim or any kind of editor**
  - $ cd problem1
  - $ vim Makefile



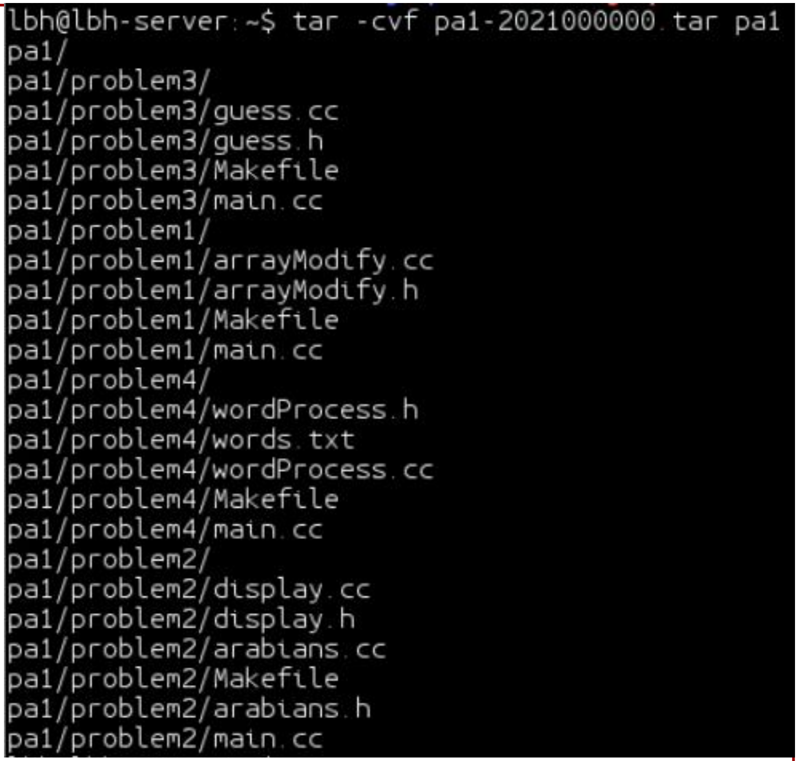
```
lbh@lbh-server:~$ tar -xvf pa1.tar
pa1/
pa1/problem3/
pa1/problem3/guess.cc
pa1/problem3/guess.h
pa1/problem3/Makefile
pa1/problem3/main.cc
pa1/problem1/
pa1/problem1/arrayModify.cc
pa1/problem1/arrayModify.h
pa1/problem1/Makefile
pa1/problem1/main.cc
pa1/problem4/
pa1/problem4/wordProcess.h
pa1/problem4/words.txt
pa1/problem4/wordProcess.cc
pa1/problem4/Makefile
pa1/problem4/main.cc
pa1/problem2/
pa1/problem2/display.cc
pa1/problem2/display.h
pa1/problem2/arabians.cc
pa1/problem2/Makefile
pa1/problem2/arabians.h
pa1/problem2/main.cc
lbh@lbh-server:~$ cd pa1
lbh@lbh-server:~/pa1$ ls
problem1  problem2  problem3  problem4
```

Submission Guide

■ Zip pa1 directory to tar file

- $ tar –cvf pa1-2021000000.tar pa1
- Submit pa1-{your-student-id}.tar

file at icampus



```
lbh@lbh-server:~$ tar -cvf pa1-2021000000.tar pa1
pa1/
pa1/problem3/
pa1/problem3/guess.cc
pa1/problem3/guess.h
pa1/problem3/Makefile
pa1/problem3/main.cc
pa1/problem1/
pa1/problem1/arrayModify.cc
pa1/problem1/arrayModify.h
pa1/problem1/Makefile
pa1/problem1/main.cc
pa1/problem4/
pa1/problem4/wordProcess.h
pa1/problem4/words.txt
pa1/problem4/wordProcess.cc
pa1/problem4/Makefile
pa1/problem4/main.cc
pa1/problem2/
pa1/problem2/display.cc
pa1/problem2/display.h
pa1/problem2/arabians.cc
pa1/problem2/Makefile
pa1/problem2/arabians.h
pa1/problem2/main.cc
```