Fall 2020

Assignment 3

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Outline

- Deadline
- No Plagiarism
- Leave Comments
- Scoring
- Problem 1
- Problem 2
- Submission
- Questions

Deadline

- Tuesday, nov 17th 23:55
- No late submissions at all

No Plagiarism

- No Mercy.
- The punishment will be made to both
 - the person who copied the code, and the person who shared the code.
- We will do plagiarism test with codes that were made in previous semesters and also in google. So be careful ©

Leave Comments

- Leave comments in your file for TAs to understand your code.
- If no comments in the file, there may be a reduction of points.

Scoring

- You should take care of your code not terminating by an issue in the middle of the loop
 - Scores will be given only by the final outputted file

Problem1 (40pt)

- 4 test cases
- If your code is correct as O X O O O if ran separately but terminates in the second test case by an error only the first test case is considered correct
- If your code output is correct for given example input1.txt file, we will give you base score 10pt.

Problem2 (60pt)

- If your code output is correct for given example in this pdf, we will give you base score
 20pt.
- In problem2, We do not provide skeleton code.
- Since the input is received by cin, the user have to enter the input in terminal directly.

Scoring

- When ran the code, the printed text (by cout) in the terminal can be recorded in a file by '>>' command
- We will score the results by saving your programs printed texts by '>>', and compare by 'diff' command
- problem1, problem2 will be graded in this way.

- Example for problem 1
 - \$ g++ -Wall problem1.cpp -o problem1
 - \$./problem1 >> output1.txt
 - \$ diff answer.txt output1.txt

- complete a Matrix class by overloading basic operator + , , *
 - If m1, m2 are *Matrix* object, and m1 = $\begin{bmatrix} 1 & 0 \\ 2 & 2 \end{bmatrix}$, m2 = $\begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$
 - $m1+m2 = \begin{bmatrix} 2 & 2 \\ 5 & 6 \end{bmatrix}, m1-m2 = \begin{bmatrix} 0 & -2 \\ -1 & -2 \end{bmatrix}, m1*m2 = \begin{bmatrix} 1 & 2 \\ 8 & 12 \end{bmatrix}$ (actual result of operator +,-,* is *Matrix* object)
 - In this program, * is matrix multiplication! If you don't know about matrix multiplication, read this <u>link</u>
 - cout<<m1*m2; -> this code should print 1 2
 8 12
- Also, you have to make transpose function which returns transpose matrix of object matrix.
 - m1.transpose() = $\begin{bmatrix} 1 & 2 \\ 0 & 2 \end{bmatrix}$, m2.transpose() = $\begin{bmatrix} 1 & 3 \\ 2 & 2 \end{bmatrix}$
 - This is const function. Do not modify object value. just generate another Matrix object that contains transpose matrix, and return it

- Instruction
 - Input
 - First row of input is size of matrix : N
 - Assume inputs are two N X N matrices. (1≤N<100)
 - From the second row to NxN+1 row, each line contains value of matrix 1.
 - From the NxN+2 to 2NxN+1 row, each line contains value of matrix 2.
 - Don't touch anything without where you supposed to write your code.
 - No error case for this input, so don't need to handle exception for this input.
 - Only integer is allowed for input. (Do not care about exception input)

Problem 1 Input

Two I/O example

	Input (input1.txt)	Output
2x2 matrix matrix 1 matrix 2	2 1 0 2 2 1 2 3 4	matrix 1: 1 0 2 2 matrix 2: 1 2 3 4 sum of matrix 1 and matrix 2: 2 2 5 6 subtract matrix 2 from matrix 1: 0 -2 -1 -2 transposed matrix 1: 1 2 0 2 transposed matrix 2: 1 3 2 4 multiplication of matrices: 1 2 8 12

3 111 1	Input (input1.txt)	Output
3x3 matrix	3	matrix 1: 1 0 3
	0	021
	3	682
	0	matrix 2:
matrix 1	2	490
	1	152
	6	204
	8	sum of matrix 1 and matrix 2:
	2	593
	4	173
	9	886
	0	subtract matrix 2 from matrix 1:
	1	-3 -9 3
matrix 2	5	-1 -3 -1
	2 2 0	48-2
	2	transposed matrix 1:
	4	028
	4	312
		transposed matrix 2:
		950
		024
		0 2 4 multiplication of matrices:
		10 9 12
		1 10 8
		36 94 24

Tip – Method of menu implementation

```
char option;
while(true)
    cin >> option;
    switch(option)
         case '1':
           //menu 1
            break;
         case '2':
           // menu 2
            break;
       . . . // You can make the program with menu like this.
         case '0':
           // exit example
            return 0;
         default :
           // Print the error message, and return back to menu
            continue;
```

Problem 2 Mcdonalds Delivery Systems

Goal: Exercise of class implementation

Program Overview

- This project is an implementation of Mcdonalds Delivery System.
- The number of delivery product is 8.
- Each user has an id, password, initial charge amount, order history. (id should be unique)
- If you want to order some product, you choose some product in the order menu.
- The program has the ability to refund orders.
- You should make the program based on Class.
- The rules of Class name, member function, # of member function are free.
- But you should encapsulate data (hide personal data ex. id, password, money, order history)
- You can use multiple classes.
- In problem2, you should get input by cin>>
- Don't care about invalid type of input.
- Please, make the program exactly same as shown in the following slide!!

<Main Menu>

```
-----Mcdonalds Delivery System----

1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select ->
```

Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

1. Sign up(10 pts)

- Implement the 'sign up' section. Input is ID, password, initial charge amounts.(Max # of account: 100 / Max length of Id, PW: 10 / If entered ID exists, then print the error message and Enter the id again.
- If you already logged in, then print the error message and back to main
- Don't care about exceed Max # of account, Max length of ID, PW.

1. Sign up(10pt)

```
----Mcdonalds Delivery System----
                                          Highlight text is your input
                                       You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 1
Input your ID(0-to main menu) : OOP
                                      ← Make the account
Input your password : 1234
Input your total money : 10000
                                               5pt
Welcome, OOP
----Mcdonalds Delivery System----
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 1
                                      ← This program can have multiple
Input your ID(0-to main menu) : 00P2
Input your password : 1232
                                      accounts(Max number: 100)
Input your total money : 20000
Welcome, OOP2
```

1. Sign up(10pt)

```
-----Mcdonalds Delivery System-----
                                           Highlight text is your input
                                       You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 1
                                      you don't have to care about invalid
Input your ID(0-to main menu) : OOP
                                                  type of input.
Input your password : 1234
Input your total money : 10000
                                       ex) assume always enter string for
                                          id/pw, integer for total money
Welcome, OOP
----Mcdonalds Delivery System----
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
                                        Exception handling
7. Logout
                                                 5pt
0. Exit
Select -> 1
                                       ← if user create the account with an
Input your ID(0-to main menu) : OOP
Duplicated user id
                                       existing ID, Print the error message
                                       and enter the other ID again.
Input your ID(0-to main menu) :
```

1. Sign up(10pt)

```
----Mcdonalds Delivery System----
                                             Highlight text is your input
                                         You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 2
Input your ID(0-to main menu) : <mark>OOP</mark>
                                          ← login process(details in 2.)
Input your password : <mark>1234</mark>
Welcome, OOP
----Mcdonalds Delivery System----
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 1
                                            ← if you already logged in, print
You are already logged in to OOP account
                                            error msg and return to main
Return to main menu
                                            menu
----Mcdonalds Delivery System----
```

Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

2. Login(10 pts)

- Implement the 'login' section. Input is ID, password.

5pt

- If you already logged in, then print the error message and back to main
- If entered ID doesn't exist, then print the error message and back to main menu.

5pt

- If entered ID exists, then enter pw.
- if entered pw doesn't match, then print the error message and ask pw again
- if entered pw matches, then print the welcome message and login to account.

2. login(10pt)

```
----Mcdonalds Delivery System----
                                           Highlight text is your input
                                       You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 2
                                       ← if entered id is not exists, print
Input your ID(0-to main menu) : OOp
                                         error message and go to main
ID is not existing
                                                      menu
----Mcdonalds Delivery System--
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 2
Input your ID(0-to main menu) : OOP
                                       ← if entered pw is not match with id
Input your password : 12
                                       account, print error message and
Wrong password!
                                       ask pw again.
Input your password : 1234
Welcome, OOP
```

2. login(10pt)

----Mcdonalds Delivery System----

```
----Mcdonalds Delivery System----
                                           Highlight text is your input
                                       You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 2
Input your ID(0-to main menu) : OOP
Input your password : 12
Wrong password!
                                        ← if entered pw is corect, print
Input your password : 1234
                                       welcome message and go to main
Welcome, OOP
                                                      menu
----Mcdonalds Delivery System----
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 2
                                           ← if you already login, and didn't
You are already logged in to OOP account
                                           logout yet, print error message and
Return to main menu
                                           back to main menu
```

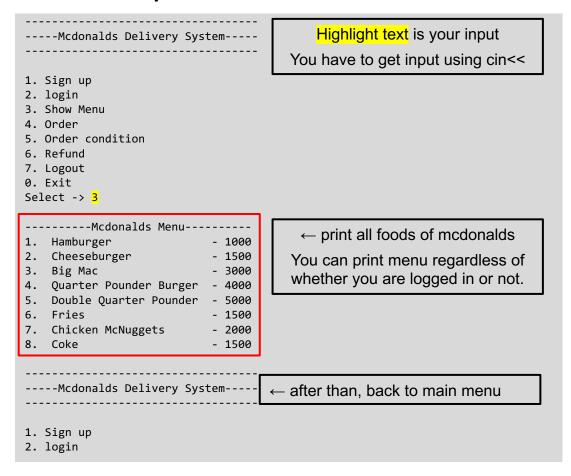
Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

3. Show menu(5 pts)

- The section of showing menu. Please refer to the following slide for the information of products.

3. Show Menu(5pt)



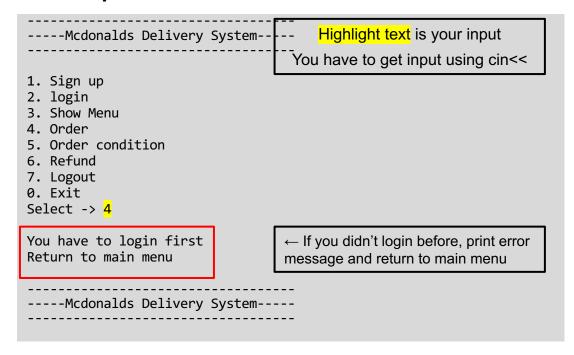
Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

4. Order(10 pts)

- The section of ordering the product after login process.
- If you are not logged in, print error message and return to main menu.
- Ask the user which food to buy and the amount to purchase, until the user input reaches 0.
- If the user input is 0, order is complete and print the total order.
- * If the total order amount exceeds the balance, print the error message

4. order(10pt)



4. order(10pt)

('~~' is food name of the

selected number)

```
Highlight text is your input
                              ----Mcdonalds Delivery System----
                                                                     You have to get input using cin<<
                             1. Sign up
                             2. login
                              3. Show Menu
                             4. Order
                              5. Order condition
                             6. Refund
                             7. Logout
                             0. Exit
                             Select -> 4
How many '~~' do you want
                             Select menu number(0-to main menu) : 2
                                                                         ← select the menu and # of food
                             How many 'Cheeseburger' do you want : 1
                             Select menu number(0-to main menu) : 3
                             How many 'Big Mac' do you want : 1
                             Select menu_number(0-to main menu) : 8
                             How many 'Coke' do you want : 2
                             Select menu number(0-to main menu) : 0
                                                                         ← If input is 0, the current order
                             Your total purchase amount is 7500
                                                                         state is printed
                             Your balance is 2500
                              Thanks
                                                                  ← after than, back to main menu
                              ----Mcdonalds Delivery System----
```

4. order (10pt)

```
Highlight text is your input
---- Mcdonalds Delivery System-
                                      You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
                            When your balance is 2500, you can't
7. Logout
                                buy Big Mac. Over the budget.
0. Exit
Select -> 4
                                Print error msg, and ask again
Select menu number(0-to main menu) : 3
How many 'Big Mac' do you want : 1
You don't have enough money!
Select menu number(0-to main menu) : 6
How many 'Fries' do you want : 1
Select menu number(0-to main menu) : 5
                                                       ← If you enter a purchase quantity
How many 'Double Quarter Pounder' do you want : 0
                                                       of 0, it is considered not purchased.
Select menu number(0-to main menu) : 0
Your total purchase amount is 9000
Your balance is 1000
Thanks
   --Mcdonalds Delivery System-
                                     ← after than, back to main menu
```

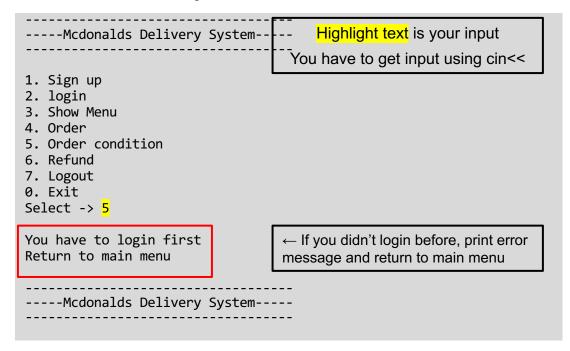
Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

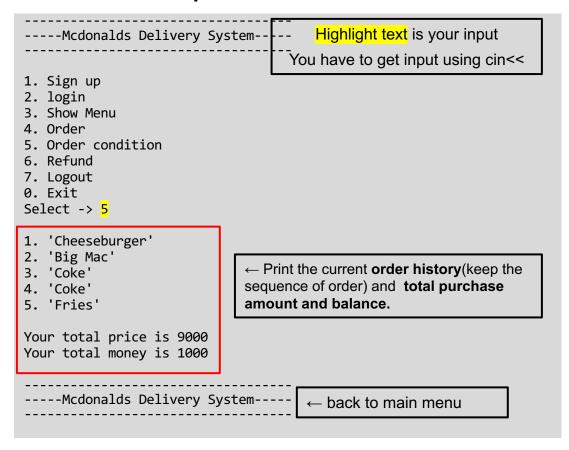
5. Order condition (5pts)

- The section of checking current user order history.
- If you are not logged in, print error message and return to main menu.
- The sequence of order history is same as the order time.
- Print the ordered food and amounts.(5pts)
- Do not print about the food item you have not ordered.(-2pts)
- + Print the total purchase amount and balance.

5. Order condition(5pt)



5. Order condition(5pt)



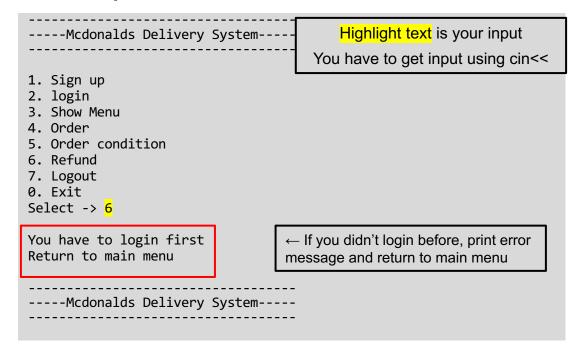
Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

6. refund(10pts)

- Refund section for ordering food.
- If you are not logged in, print error message and return to main menu.
- If the user selects the item to be refunded, item will be refunded. You have to get refund money back **(5pts)**
- Print the error message for wrong input and try typing again.(5 pts)

6. Refund(10pt)



6. Refund(10pt)

```
-----Mcdonalds Delivery System-----
                                            Highlight text is your input
                                        You have to get input using cin<<
1. Sign up
2. login
3. Show Menu
4. Order
5. Order condition
6. Refund
7. Logout
0. Exit
Select -> 6

    'Cheeseburger'

2. 'Big Mac'
3. 'Coke'
4. 'Coke'
5. 'Fries'
Your total price is 9000
                                           ← Print the current order
Your total money is 1000
                                           condition(keep the sequence of
Choose number(0 - to main menu) : 2
                                           order) and ask what to refund, select
Successfully returned
                                           refund item

    'Cheeseburger'

                               ← Print the current order
2. 'Coke'
3. 'Coke'
                               condition and ask what to
4. 'Fries'
                               refund again, after item
Your total price is 6000
                               refunded
Your total money is 4000
Choose number(0 - to main menu) : 3
Successfully returned

    'Cheeseburger'

2. 'Coke'
3. 'Fries'
Your total price is 4500
Your total money is 5500
```

6. Refund(10pt)

```
    'Cheeseburger'

                                        Highlight text is your input
2. 'Coke'
Your total price is 3000
                                     You have to get input using cin<<
Your total money is 7000
Choose number(0 - to main menu) : 3
                                         ← if you enter a number
Wrong input!
                                         that is not in the list, print
Choose number(0 - to main menu) : 2
                                         error msg and ask again
Successfully returned

    'Cheeseburger'

Your total price is 1500
Your total money is 8500
Choose number(0 - to main menu) : 1
Successfully returned
                               ← when order food list is empty, print total
Your total price is 0
                               price, total balance(money). Ask again until
Your total money is 10000
                               user enter 0
Choose number(0 - to main menu) : 1
Wrong input!
Choose number(0 - to main menu) :
```

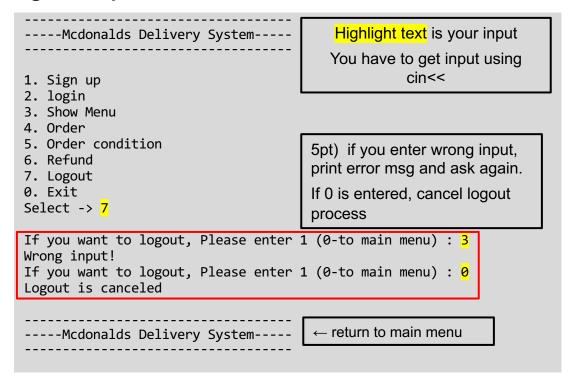
Program Details (Total score: 60pts)

* Make the member function or function for the following problem.

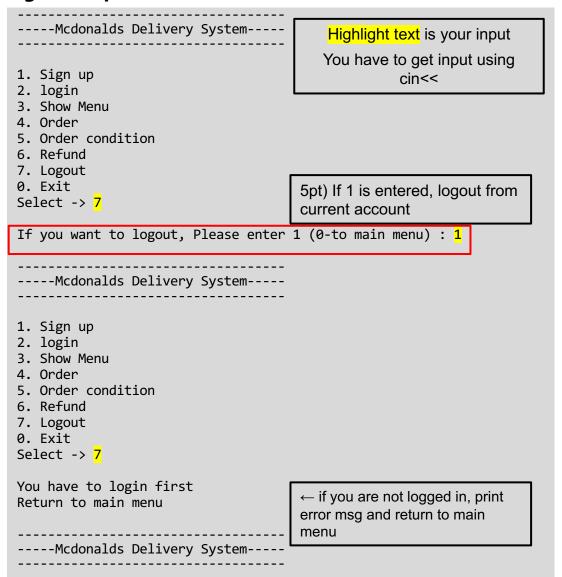
7. logout(10pts)

- logout section
- If you are not logged in, print error message and return to main menu.
- If the user enter 0, logout process should be cancelled.
- If the user enter 1, logout from the current account.
- Print the error message for wrong input(all input except 0, 1) and ask again.

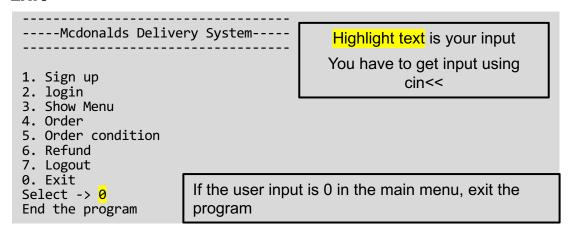
7. **logout(10pt)**



7. logout(10pt)



8. Exit



Submission

- Zip the folder by running following command correctly
 - tar –zcvf 2020123456 hw3.tar.gz 2020123456 hw3/
- studentId_hw3.tar.gz
 - Ex) 2020123456_hw3.tar.gz
- There is going to be reduction of points if not following the folder hierarchy as well
- If unzipped your submission .tar.gz file should follow the folder hierarchy below

Current directory

- studentld hw3.tar.gz
- studentId_hw3
 - problem1.cpp
 - problem2.cpp

Questions

- Use <u>oop20202@gmail.com</u> for questions
- We are not going to answer
 - Questions sent to TAs' personal mails
 - Questions not making sense
 - Questions related to the algorithm for solving the question
 - Questions you can infer the answer if read this file thoroughly
 - Questions you can simply solve by googling
 - Ex) how do I make a folder on ubuntu?

Appendix

- Zipping and unzipping the folder by tar command
 - <u>https://linuxize.com/post/how-to-extract-unzip-tar-gz-file/</u>
 - https://www.cyberciti.biz/faq/how-do-i-compress-a-whole-linuxor-unix-directory/