Concordia University
COMP 248 – Winter 2023
Assignment 1

Due Date:	By 11:59pm February 3rd, 2023
Evaluation:	2% of final mark (see marking rubric at the end of handout)
Late Submission:	none accepted.
Purpose:	The purpose of this assignment is to help you learn Java identifiers, variables, String, input/output, and arithmetic expression.
CEAB/CIPS Attributes:	Design/Problem analysis/Communication Skills

NOTE 1: *You are NOT allowed to post any assignment and/or its solution anywhere on the World Wide Web (WWW) and/or the Internet. Intellectual Property Rights are reserved. If any case is discovered via your account or IP address; your submission will NOT be considered and will be reported immediately to the appropriate authority.*

NOTE 2:

i. Do not use/import any other library/package other than *java.util.Scanner*
ii. Do not use any flow-control statements such as selection (if-else), iteration (loops), etc.

General Guidelines When Writing Programs:

- Include the following comments at the top of your source codes.

```
// -----------------------------------------------------------------------
// Assignment (include number)
// Written by: (include your name and student ID)
// For COMP 248 Section (your section) – Winter 2023
// -----------------------------------------------------------------------
```

- In a comment, give a general explanation of what your program does. As the programming questions get more complex, the explanations will get lengthier.
- Include comments in your program describing the main steps in your program. Focus on your comments should be on the "why" than the "how".
- Display a welcome message.
- Display clear prompts for users when you are expecting the user to enter data from the keyboard.
- All output should be displayed with clear messages and in an easy-to-read format.
- End your program with a closing message so that the user knows that the program has terminated.

Question #1: Crypto Change Program (7pts)

Write a program that determines the change to be given by a 3rd millennium scalper selling tickets to a grimvalor game. In this question, you will use the crypto coins of the forthcoming millennium (year 2050-3000): *Pesico*, *Bitom*, *Ditom*, *Zitom* and *Cryptom*.

A Pesico coin will be the largest denomination.
7500 Cryptom coins will be equivalent to 1 Pesico.
500 Cryptom coins will be equivalent to 1 Bitom.
200 Cryptom coins will be equivalent to 1 Ditom.
50 Cryptom coins will be equivalent to 1 Zitom.

Assume that a ticket to the game costs between 1 Cryptom (Junior grimvalors) and 1 Pesico (Pro level), and the scalper only accepts a single Pesico coin to pay for the ticket. When calculating the change to return, always maximize larger denominations; for example, if 800 Cryptom need to be returned, you should return 1 Bitom, 1 Ditom, and 2 Zitom, as opposed to 16 Zitom or even 800 Cryptom.

1. Write an algorithm for the Crypto Change Program.
2. Name of the class/program = A1_Q1.
3. Display a welcome/salutation message to the user of the program.
4. Display a prompt message for the user to enter the price of the ticket in Cryptom. Kindly note that we assume that the user enters a valid price (i.e. price should not exceed 7500). You do not need to write any statements to check for the validity of the entered price.

The following are samples of screenshots to illustrate the expected behavior of your program. Your program must display the same information with the same format and should work for any valid user entered data.

```
Welcome to the Crypto Change Program:
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Enter the price of the ticket in Cryptom(at most 7500): 1400

You bought a ticket for 1400 Cryptom. and gave me a Pesico, so your change is
12 Bitom,
0 Ditom,
2 Zitom, and
0 Cryptom.


Thank you for using my bespoke Crypto Change Program!

Enjoy the Game!
```

Figure 1: Sample1 output of Question1.

```
Welcome to the Crypto Change Program:
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Enter the price of the ticket in Cryptom(at most 7500): 870

You bought a ticket for 870 Cryptom. and gave me a Pesico, so your change is
13 Bitom,
0 Ditom,
2 Zitom, and
30 Cryptom.


Thank you for using my bespoke Crypto Change Program!

Enjoy the Game!
```

Figure2: Sample2 output of Question1.

```
Welcome to the Crypto Change Program:
++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Enter the price of the ticket in Cryptom(at most 7500): 3800

You bought a ticket for 3800 Cryptom. and gave me a Pesico, so your change is
7 Bitom,
1 Ditom,
0 Zitom, and
0 Cryptom.


Thank you for using my bespoke Crypto Change Program!

Enjoy the Game!
```

Figure3: Sample3 output of Question1.

Questions #2: Simple Cinema Tickets Invoice Program(7pts)

Concordia Office of Community Engagement will lunch a movie theater project that will screen movies which ended their run at theaters for a reduced ticket price of $6.99. The cinema will accept only prepaid gift card. You have been selected to be part of this project in the capacity of a research Intern. In this regard, your primary task involves writing an algorithm and Java class/program to accomplish the following:

1. Name of the class/program: A1_Q2.
2. Display a welcome/salutation message to the user of the program.
3. Display a prompt message for the user to enter the prepaid gift card retailer or bank name as a string.
4. Output a message that displays the name of the gift card used for ticket(s) purchase in upper case.
5. Display a prompt message for the user to enter the fund on the gift card as a decimal number. Kindly note that the user should enter a value greater than the movie ticket price.
6. Output a message that displays the fund on the aforementioned prepaid gift card.
7. Thereafter, process the entered fund value on the gift card, such that it is used to compute the number of tickets that can be bought and the balance that can be left on the gift card.

8. Output a message that displays the number of tickets that can be bought and the balance that can be left on the gift card.
9. Then, display a prompt message for the user to enter the number of tickets they want to purchase as an integer number. Kindly note that the user should enter a number equal or less the number of tickets that can be bought with the fund on the gift card, see point 8 above.
10. Output a message of the number of tickets purchased and the cost.
11. Next, compute and output the balance on aforementioned gift card as a double.
12. Display a prompt message for the user to enter the purchase information: day, month and year as integer number. We assume the user enter valid day, month, and year.
13. Generate the invoice based on the information entered by the user above, see the sample outputs. First the invoice should display the name *Cinema Concordia*, followed by the day of purchase, the number of tickets bought, the amount redeemed from the gift card, and the balance left.
14. Display a message: `Invoice generated successfully.`
15. Finally, display a complimentary-close message as follows:
    `Thank you for using my bespoke Cinema Tickets Invoice Program!`

The following are sample screenshots to illustrate the expected behavior of your program. Your program must display the same information using the same format.

```
Welcome to the Simple Cinema Tickets Invoice Program:
++++++++++++++++++++++++++++++++++++++++++++++++++++++++
Enter the prepaid gift card retailer/bank name: Concordia joy
You will be using CONCORDIA JOY gift card for your ticket(s) purchase.
Enter the amount on the gift card: 100
There is a fund of $100.0 on your prepaid CONCORDIA JOY gift card.
Using your CONCORDIA JOY gift card you can purchase 14 tickets and have a balance of $2.14 on the gift card.
Enter the number of tickets you want to purchase: 2
The purchase of 2 ticket(s) costs $13.98.
The balance left on your CONCORDIA JOY gift card is $86.02.

Please enter your purchase info:

Day Of purchase (between 1 and 31): 1
Month Of purchase (between 1 and 12): 22
Year Of purchase (between 2023 and 2028): 2023
_____________________________________________________________________________
                        Cinema Concordia       1/22/2023



_____________________________________________________________________________

2 Tickets                                                              $13.98
$13.98 was redeemed from CONCORDIA JOY prepayed gift card.
CONCORDIA JOY gift card balance                                        $86.02
_____________________________________________________________________________
Invoice generated successfully.


Thank you for using my bespoke Cinema Tickets Invoice Program!
```

Figure4: Sample1 output of Question2.

```
Welcome to the Simple Cinema Tickets Invoice Program:
++++++++++++++++++++++++++++++++++++++++++++++++++++++
Enter the prepaid gift card retailer/bank name: fund 2 Go
You will be using FUND 2 GO gift card for your ticket(s) purchase.
Enter the amount on the gift card: 65.80
There is a fund of $65.8 on your prepaid FUND 2 GO gift card.
Using your FUND 2 GO gift card you can purchase 9 tickets and have a balance of $2.89 on the gift card.
Enter the number of tickets you want to purchase: 8
The purchase of 8 ticket(s) costs $55.92.
The balance left on your FUND 2 GO gift card is $9.88.

Please enter your purchase info:

Day Of purchase (between 1 and 31): 10
Month Of purchase (between 1 and 12): 3
Year Of purchase (between 2023 and 2028): 2024
_____________________________________________________________________
                        Cinema Concordia       10/3/2024



_____________________________________________________________________

8 Tickets                                                       $55.92
$55.92 was redeemed from FUND 2 GO prepayed gift card.
FUND 2 GO gift card balance                                     $9.88
_____________________________________________________________________
Invoice generated successfully.


Thank you for using my bespoke Cinema Tickets Invoice Program!
```

Figure5: Sample2 output of Question2.

```
Welcome to the Simple Cinema Tickets Invoice Program:
++++++++++++++++++++++++++++++++++++++++++++++++++++++
Enter the prepaid gift card retailer/bank name: MasterCard
You will be using MASTERCARD gift card for your ticket(s) purchase.
Enter the amount on the gift card: 34.95
There is a fund of $34.95 on your prepaid MASTERCARD gift card.
Using your MASTERCARD gift card you can purchase 5 tickets and have a balance of $0.0 on the gift card.
Enter the number of tickets you want to purchase: 5
The purchase of 5 ticket(s) costs $34.95.
The balance left on your MASTERCARD gift card is $0.0.

Please enter your purchase info:

Day Of purchase (between 1 and 31): 2
Month Of purchase (between 1 and 12): 2
Year Of purchase (between 2023 and 2028): 2023
_____________________________________________________________________
                        Cinema Concordia       2/2/2023



_____________________________________________________________________

5 Tickets                                                       $34.95
$34.95 was redeemed from MASTERCARD prepayed gift card.
MASTERCARD gift card balance                                    $0.0
_____________________________________________________________________
Invoice generated successfully.


Thank you for using my bespoke Cinema Tickets Invoice Program!
```

Figure6: Sample3 output of Question2.

Submitting Assignment 1

- Zip the source code (the .java files only please) of this assignment.
- Naming convention for zip file: Create one zip file, containing the source files for your assignment using the following naming convention:
  - The zip file should be called *a#_studentID*, where # is the number of the assignment and *studentID* is your student ID number.
    For example, for the first assignment, student 123456 would submit a zip file named a1_123456.zip
- Submit your zip file on e-Concordia or Moodle course webpage.

Evaluation Criteria for Assignment 1 (20 points)

Source Code		
Comments for the two questions (3 pts.)		
Description of the program (authors, date, purpose)	1	pt.
Description of variables and constants	1	pt.
Description of the algorithm	1	pt.
Programming Style for the two questions (3 pts.)		
Use of significant names for identifiers	1	pt.
Indentation and readability	1	pt.
Welcome Banner/Closing message	1	pt.
Question 1 (7 pts.)		
Describe the algorithm	1	pt.
Prompt user and read data	1	pt.
Compute the change	3	pts.
Display results accordingly and appropriately	2	pts
Question 2 (7 pts.)		
Prompt user and read data	1	pt.
Compute the number the potential and actual tickets	2	pts.
Compute the potential and actual balance on the gift card	2	pts.
Display results accordingly and appropriately	2	pt.
TOTAL	**20**	**pts.**