Borough of Manhattan Community College
Computer Information Systems
CSC 111 – Introduction to Programming

Assignment 1 – Fall 2020

Due Date: *by Wednesday September 30, 2020 11:59PM*
How to submit: *upload C++ source files to Blackboard*

In this assignment we will apply the techniques learned in chapters 1, 2, 3, and 4. Your solution must compile, run, and produce the required output.

Note:

- ✓ ***this is an individual assignment; please do your own work, sharing and/or copying code and/or solution ideas with/from others will result in a grade of 0 and disciplinary actions for all involved parties. If you run into problems and have done your best to solve them, please contact me before/after class or by e-mail.***
- ✓ ***A 20% grade deduction for every day the assignment is late.***

How to submit:

Log into your Blackboard account, click on assignments then Assignment 1. Please upload your source file only (CPP). Your submission must be received by the indicated due date.

Assignment's Instructions

Write a C++ program which performs the following steps. Pay attention the compiler warning messages. Remember to comment your code. Comments should explain every major step in your code.

1. Create three constants as follows:
   - ✓ Theater's percentage with value 0.195
   - ✓ Adult ticket price with value 10.5
   - ✓ Child ticket price with value $\sqrt{adult\ ticket\ price}$. You must use the $sqrt$ function from the $math$ library.
2. Prompt the user to enter a movie $name$. If the movie name consists of fewer than 5 characters, print a message and terminate the program. See Figure 1.
3. Prompt the user to enter the number of $adult$ tickets sold. If the number is 0 or negative, print a message and terminate the program. See Figure 2.
4. Prompt the user to enter the number of $child$ tickets sold. If the number is 0 or negative, print a message and terminate the program. See Figure 3.
5. Compute the gross profit: $(\#adult\ tickets \times adult\ ticket\ price) + (\#child\ tickets \times child\ ticket\ price)$
6. Compute net profit: $gross\ profit \times theater's percentage$
7. Compute savings: $gross\ profit - net\ profit$
8. Display the formatted results as shown in Figure 4:
   - ✓ Must use $setfill$ to display the 50 equal signs (^). Do NOT type 50 consecutive ^'s.
   - ✓ Each label column is a column of 22 characters.
   - ✓ Value column is using precision 3 and scientific notation
   - ✓ Note that you must print the double quotes around the movie's name and the $ for the last three values.
   - ✓ Use the following input lines for testing: *Sonic the Hedgehog*
     548812399
     106900000

Figures

```
Name of the movie: short
Movie name must consist of 5 or more characters
```

Figure 1: A movie name must contain more than 5 characters

```
Name of the movie: Sonic the Hedgehog
Number of adult tickets sold: 0
Number of adult tickets must be greater than 0
```

Figure 2: Number of adult tickets mut be larger than 0

```
Name of the movie: Sonic the Hedgehog
Number of adult tickets sold: 100
Number of child tickets sold: -5
Number of child tickets must be greater than 0
```

Figure 3: Number of adult tickets mut be larger than 0

```
Name of the movie: Sonic the Hedgehog
Number of adult tickets sold: 548812399
Number of child tickets sold: 106900000


Movie Sales Report
^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
          Movie Name: "Sonic the Hedgehog"
  Adult Tickets Sold: 548812399
  Child Tickets Sold: 106900000
       Gross Profit: $6.11e+09
         Net Profit: $1.19e+09
            Savings: $4.92e+09
```

Figure 4: Number of adult tickets mut be larger than 0

Assessment:

Code comments	10
3 Constants (with math function)	15
3 prompts (message and extract) – movie and # tickets	12
3 Input validation	12
Gross profit computation – uses consts	6
Net profit computation – uses const	5
Savings computation	5
Formatted output	
Header including separator line (====)	10
5 labels aligned right	15
5 values using precision 2 and scientific notation	10
	100