

## BTM 200 – Assignment 1

### Learning Outcomes

- Learning to write larger programs with more complicated logic,
- Using complex decision making in a program,
- Using flag variables,
- Performing basic string handling,
- Problem solving,
- Debugging.

### Problem Description

You have been hired by a movie theatre to write an application which can compute the price of a ticket and any other charges to get the total price for the movie and print an itemized receipt. The price of a ticket is computed based on the following rules:

- The base price of a ticket is \$14.00
- Weekend tickets are increased by 20% of the base price,
- Evening tickets (17:00 or later) cost \$3 more than matinee tickets,
- Blockbuster movies cost 10% more than the base price,
- Patrons 16 and younger get a 15% discount on the computed ticket price (not including food),
- Patrons 65 and older get a 10% discount on the computed ticket price,
- A snack pass is available for \$15 which will allow you to get 3 medium sized drinks and 2 medium sized popcorn,
- VIP seating (includes a pillow!) is available on weekdays after 17:00 and all day on weekends. VIP seats can be purchased for an additional \$5. The program will only ask if the patron wishes to purchase VIP seating if it is available for the show time selected.
- Taxes are calculated at 13% on the total of all purchases.

The program will be pre-loaded with the schedule of the following movies.

Title	Blockbuster	Showtimes
The Gentleman	No	Wed 15:30, Thu 19:00, Sat 13:00
The Invisible Man	No	Tue 13:30, Wed 19:00, Sun 13:00
Sonic The Hedgehog	Yes	Mon 16:30, Fri 14:00
Bad Boys for Life	No	Mon 17:30, Wed 10:00, Sat 13:00, Sun 15:00

A single run of the program is necessary to purchase a single ticket. If you want to purchase multiple tickets, the program must be run multiple times. The following shows example outputs from the program handling various scenarios. Note that all data is checked for validity (except the age) and the program continues to prompt until it gets valid data.

----- Child purchasing weekday matinee blockbuster -----

Enter your age: 12

Please select from the following movies:

- 1- The Gentleman
- 2- The Invisible Man
- 3- Sonic The Hedgehog
- 4- Bad Boys for Life

3

Select one of the following showing times:

- 1- Mon 16:30
- 2- Fri 14:00

2

Would you like to purchase our snack pass? y

\*\*\*\*\* Seneca Theatre \*\*\*\*\*

Sonic The Hedgehog Fri 14:00	15.40
Age Discount	2.31
Snack Pass	15.00
Tax	3.65
Total	31.74

----- Adult Purchasing weeknight non-blockbuster with VIP -----

Enter your age: 42

Please select from the following movies:

- 1- The Gentleman
- 2- The Invisible Man
- 3- Sonic The Hedgehog
- 4- Bad Boys for Life

1

Select one of the following showing times:

- 1- Wed 15:30
- 2- Thu 19:00
- 3- Sat 13:00

2

Would you like to purchase VIP seating for The Gentleman Thu 19:00?

z

Invalid selection: must be Y or N

y

Would you like to purchase our snack pass? n

\*\*\*\*\* Seneca Theatre \*\*\*\*\*

The Gentleman Thu 19:00	17.00
VIP Seating	5.00
Tax	2.86
Total	24.86

-----Senior purchasing weekend matinee with no extras -----

Enter your age: 66

Please select from the following movies:

- 1- The Gentleman

- 2- The Invisible Man
- 3- Sonic The Hedgehog
- 4- Bad Boys for Life
- 5

Invalid selection: must be between 1 and 4.

Please select from the following movies:

- 1- The Gentleman
- 2- The Invisible Man
- 3- Sonic The Hedgehog
- 4- Bad Boys for Life

1

Select one of the following showing times:

- 1- Wed 15:30
- 2- Thu 19:00
- 3- Sat 13:00

4

Invalid selection: must be between 1 and 3.

Select one of the following showing times:

- 1- Wed 15:30
- 2- Thu 19:00
- 3- Sat 13:00

3

Would you like to purchase VIP seating for The Gentleman Sat 13:00?

n

Would you like to purchase our snack pass? n

\*\*\*\*\* Seneca Theatre \*\*\*\*\*

The Gentleman Sat 13:00 16.80

Age Discount 1.68

Tax 1.97

Total 17.09

## Reflections

Reflections should be at least 100 words each and should address the questions in sufficient depth and use good English.

1. Which decision structures did you use in your program? Show an example of where you used two different decision structures and explain why you selected one over the alternatives in each of the two situations.
2. The program needed to remember the name and showtime of the movie the patron selected. Describe how you stored the name of the movie and the showtime so that they could be printed on the receipt.
3. The arithmetic in this program is done using floating point which is retaining fractional cents. Describe how floating point arithmetic might give a different answer from that using integer arithmetic to the nearest cent. If you were going to perform the arithmetic using integers, when would you need to convert floating point values to integers (in cents) to avoid the problem of

fractional cents accumulating? You should list one or more points in the calculations when the values should be converted to cents.

### Submission

You should submit your code in a file called “movie1.c” and your reflections in a file called “reflect.txt” to Matrix using the submitter. Upload your files to the same directory on the submitter and test the code to make sure everything works properly. For example:

```
> gcc -Wall movie1.c -o movie
```

Which will compile your code and place the executable in a file called “movie” which you can then run and test. Your code should compile without errors or warnings before you submit it. To do the submission type:

```
~profname.proflastname/submit btm200/a1 <ENTER>
```

and follow the instructions.