COMP10120 Assignment 2

MegaMillions

Examine the rules for the Mega Millions Lottery in the United States of America.

Create a program in C which simulates a Mega Millions Lottery according to the text below.
Please format all your code according to this style guide:
https://codingart.readthedocs.io/en/latest/c/Formatting.html
Assume the Jackpot is fixed at $100 million.

Part 1 Generate Tickets (50%)

The program should request input from the user about how many tickets to generate.
The program should then generate that number of lottery tickets (you can assume only one set of 6 numbers per ticket).

Each lottery ticket should have a unique identifier, the numbers should be random, conform to the rules of the Mega Millions Lottery and the Megaplier option should be randomly decided for each ticket. There is no need to implement Just the Jackpot.
These lottery tickets should be saved to a human-readable .txt file with the white ball numbers sorted from lowest to highest numerical value.
An example of how the human-readable file could look:

```
1, 2, 24, 35, 38, 54, 3, 1
2, 10, 13, 30, 52, 69, 9, 0
3, 4, 10, 49, 55, 65, 20, 0
4, 9, 23, 52, 57, 70, 2, 1
```

Where the columns are firstly the unique identifier, then the 5 white balls (in sorted order), then the gold ball and finally a binary megaplier option for that ticket.

Part 2 Conduct the draw (50%)

One set of winning numbers and a Megaplier should be generated (randomly) and printed.

The generated file in Part 1 should be **read back in** and checked against the winning numbers.
Print the unique identifier, numbers, and amount won of any lottery tickets that win more than $400.

Print summary statistics for won amounts less than $400. This should include the average amount won per ticket, and number of winners at each unique prize amount. Also include the total amount paid out in prizes, the total amount of sales and the total profit.

Print the cash vs annuity options for if the Jackpot is won including the expected amount at each year (see the website).

Example output could be:

```
You have requested 200000 tickets
Winning numbers:  5 23 29 34 42 | 2

Winning Tickets:
Ticket Number 107608
Numbers: 5 23 34 42 64 | 4
Won: $1000

Ticket Number 124916
Numbers: 5 23 34 42 62 | 15
Won: $500

Ticket Number 148504
Numbers: 5 12 23 29 42 | 5
Won: $20000

In addition, without a Megaplier:
2764 won $2
1129 won $4
301 won $10
10 won $200
With a Megaplier:
2772 won $4
1116 won $8
295 won $20

There were 8397 winners in total!
The total sales were: $500116
The total payout was: $64870
The average amount won was $7.73
The total profit was: $435246

If the Jackpot is won:
Cash option: $100000000

Annuity option: Inital Payment: $1500000
Year 2: payment is $1575000 ....etc
```

Implement appropriate error handling, and provide a nice output with the results. Things to consider for this and all programs:

- The data types to use in the program.

- How to handle edge cases.
- The instructions needed for users.
- Appropriate Error handling with input (e.g. an impossible height is entered)- There is no need to check for data types.
- How to format the output in a user-friendly way.
- Description of the program/author in the header.
- The use of white space.
- The use of comments.
- The efficiency. For example, is longhand used where a loop would be better or are unnecessary variables created.

This program should be submitted via Brightspace as a single c file. The naming convention is 123456A2.c where 123456 is your student number and A2 denotes Assignment 2.

Submissions should be made as a single .c file that runs in C99 on Brightspace