DASC 1204 – Introduction to OOP for Data Science
Programming Project Report

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Academic Integrity Statement: I pledge that this programming project is my work and that I have neither given nor received unauthorized help on this assignment.

Problem Statement:

- This section should describe the goals of the assignment.
- What are the program inputs?
- What are the program outputs?
- What error handling was required?

- Ask the user how many quarters they have and how much the games cost that they want to play.
- Ask the user how much money The Palace makes each night.
- How many games each player can play, how much the game costs, and how many quarters they have left. How much money The Palace makes each week, month, and year.
- When asking the user for inputs, the inputs were of types integer or double so that the program won't run if the user inputs a string for how many quarters.

Design:

- This section should describe the design decisions you made.
- What data structures did you use?
- What algorithms did you use?
- What were pros/cons of the choices above?

- I used integer and double data types.
- I used a Scanner object for reading inputs, math functions (/, *, %) for calculations, and printf function for formatting the profit amounts properly.
- Using integer for quarters is great because you can't have half a quarter, and using doubles for profit amounts is useful because I don't want to round dollar amounts to a whole number. I don't see any disadvantages to using these.

Implementation:

- This section should describe your implementation process.
- What sample code did you start with?
- How did you extend or adapt this code?
- What was your development timeline?
- If you used concepts outside of the scope current topics in this class, where did you gain this knowledge?

- I started with creating the print statements, importing Scanner, and creating a new Scanner object.
- Starting with the print statements made it easier for me to visualize exactly what calculations I needed to do.
- Started with print statements and calculations for the quarter amounts, then did print statements and calculations for profits. In total this took me about an hour.

Testing:

- This section should describe your testing process.
- Show your program output with simple test cases
- Show your program output with special test cases
- Did everything work as expected?

- Started very simple with trying different game costs with each player starting with 12 quarters. I picked 12 because it is easily divisible by 1, 2, 3, and 4. This allowed me to make sure the calculations were accurate.

```
Welcome to the Hawkins Palace Arcade!
How many quarters did Dustin bring with him? >>
12
How many quarters do the games Dustin prefer cost? >>
1
How many quarters did Lucas bring with him? >>
12
How many quarters do the games Lucas prefer cost? >>
2
How many quarters did Mike bring with him? >>
12
How many quarters do the games Mike prefer cost? >>
3
How many quarters did Max bring with him? >>
12
How many quarters do the games Max prefer cost? >>
4
Dustin will be able to play 12 games that cost 1 quarter(s), and will have 0 quarters remaining.
Lucas will be able to play 6 games that cost 2 quarter(s), and will have 0 quarters remaining.
Mike will be able to play 4 games that cost 3 quarter(s), and will have 0 quarters remaining.
Max will be able to play 3 games that cost 4 quarter(s), and will have 0 quarters remaining.
```

- I then tried negative numbers, 0, and letters.
    - Letters throw an error as expected, dividing by 0 is an error, and negative numbers don't work as expected.

```
Welcome to the Hawkins Palace Arcade!
How many quarters did Dustin bring with him? >>
f
Exception in thread "main" java.util.InputMismatchException
```

```
        at java.base/java.util.Scanner.throwFor(Scanner.java:939)
        at java.base/java.util.Scanner.next(Scanner.java:1594)
        at java.base/java.util.Scanner.nextInt(Scanner.java:2258)
        at java.base/java.util.Scanner.nextInt(Scanner.java:2212)
        at Main.main(Main.java:18)

Welcome to the Hawkins Palace Arcade!
How many quarters did Dustin bring with him? >>
1
How many quarters do the games Dustin prefer cost? >>
0
How many quarters did Lucas bring with him? >>
0
How many quarters do the games Lucas prefer cost? >>
1
How many quarters did Mike bring with him? >>
10
How many quarters do the games Mike prefer cost? >>
0
How many quarters did Max bring with him? >>
0
How many quarters do the games Max prefer cost? >>
34
Exception in thread "main" java.lang.ArithmeticException: / by zero
        at Main.main(Main.java:35)

Welcome to the Hawkins Palace Arcade!
How many quarters did Dustin bring with him? >>
10
How many quarters do the games Dustin prefer cost? >>
-34
How many quarters did Lucas bring with him? >>
-4
How many quarters do the games Lucas prefer cost? >>
10
How many quarters did Mike bring with him? >>
-5
How many quarters do the games Mike prefer cost? >>
-6
How many quarters did Max bring with him? >>
-1
How many quarters do the games Max prefer cost? >>
-1
Dustin will be able to play 0 games that cost -34 quarter(s), and will have 10 quarters remaining.
Lucas will be able to play 0 games that cost 10 quarter(s), and will have -4 quarters remaining.
Mike will be able to play 0 games that cost -6 quarter(s), and will have -5 quarters remaining.
```

Max will be able to play 1 games that cost -1 quarter(s), and will have 0 quarters remaining.

- Everything worked as expected, even if a player started with 0 quarters, which I didn't expect to work. But I'm surprised that it doesn't throw an error for negative numbers

Conclusions:

- This section should describe the overall result of the assignment.
- Was the programming project a success?
- What would you do same or differently next time?
- How long did the project take to complete?
- Choose the most challenging section of code, and explain what is happening and how it works. (this will likely be 2-10 lines of code total)

- Yes, I am very happy with program.
- I would do the same because starting with print statements made it much more clear to me.
- Including the report, it took 1.5 to 2 hours.
- The most challenging section is understanding the formatting using printf to change the dollar values to readable USD.