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Project 1 Code Results

Stats Library

```
List: [10, 99, 40, 92, 62, 73, 46]
Mean: 60.285714285714285
Median: 62.0
Mode: null
Standard Deviation: 28.818219860330846

Independent Probabilities:
Rich: 0.2
Liked orange color: 0.1
Rich and likes orange color: 0.020000000000000004

Dependent Probabilities:
Rich: 0.2
CEO, given Rich: 0.67
Rich and CEO: 0.134

Union of exclusive events:
Has orange cat: 0.25
Has black cat: 0.49
Has orange or black cat: 0.74

Union of non-exclusive events:
Likes cats: 0.25
Likes dogs: 0.49
Likes cats and dogs: 0.1
Likes cats or dogs: 0.62

Bayes' Theorem:
Rich: 0.09
CEO: 0.13
CEO given Rich: 0.42
Rich given CEO: 0.2907692307692308

Checks dependency of events:
Has car: 0.67
Likes swimming: 0.37
Has car and likes swimming: 0.2479
Are dependent: false

Likes sport: 0.78
Is healthy: 0.29
Likes sport and is healthy: 0.67
Are dependent: true

Permutations:
Total number of cats: 30
Cats to give to students/number of students: 21
Permutations (a number of ways to distribute cats across students): 730965773291972714496000000

Combinations:
Number of available grocery items: 66
Items to buy: 46
Combinations (a number of ways to buy grocery items): 40661170824914640

Binomial Probability:
Chance of winning a lottery: 0.05
Chance of getting 1 success(es) in 52 attempts: 0.1900540889334815

Geometric Probability:
Success chance: 0.04
Attempts: 83
Chance of getting a success at the end of the series of attempts: 0.0014070226885092394

Airline problem
Answer: 42 flights

Assembly problem
Answer: 6
PS C:\Users\New>
```

Set Operations

```
First List: [Monday, Tuesday, Monday]
Second List: [Friday, Tuesday, Monday, Sunday]

Union: [Monday, Tuesday, Friday, Sunday]

Intersection: [Monday, Tuesday]

First complement: [Wednesday, Thursday, Friday, Saturday, Sunday]
Second complement: [Wednesday, Thursday, Saturday]
```

Doors Program

```
PS C:\Users\New\Desktop\Java Documents\Project1> &
c317df8e20d207c62bbda9\redhat.java\jdt_ws\jdt.ls-java
Wins (the door is not changed): 0.3389
Wins (the door is changed): 0.6667
```

```
PS C:\Users\New\Desktop\Java Documents\Project1> c
w\AppData\Roaming\Code\User\workspaceStorage\7fac57
Wins (the door is not changed): 0.3372
Wins (the door is changed): 0.6589
PS C:\Users\New\Desktop\Java Documents\Project1>
```

Birthday Program

```
Enter the number of people: 30
Enter the number of runs: 10000
The probability of any two people sharing a birthday is 0.7074
Try again? (y/n): █
```

Pokemon Program

Simulation of a single run

```
----- S E T U P (Alice) -----
Alice got a pokemon!
Alice has set aside the prize cards!
-----

----- S E T U P (Bob) -----
Bob got a pokemon!
Bob has set aside the prize cards!
-----

--> Bob took HealTrainer
    --> Bob added HealTrainer to prize
Cards left in deck: 24
Forcing a fight...

----->    Charmander vs Bulbasaur    <-----
Opponent's Bulbasaur is defeated!
Opponent's fighter:
[ Bulbasaur:, HP: 0/50, Attack: 81, Defense: 43 ]
Searching for pokemon...
Taking from deck...
--> Alice took WaterEnergy
    --> Alice added WaterEnergy to prize
Cards left in deck: 24
Forcing a fight...

----->    Bulbasaur vs Charmander    <-----
Opponent's fighter:
[ Charmander:, HP: 50/50, Attack: 17, Defense: 92 ]
--> Bob took AttackTrainer
    --> Bob added AttackTrainer to prize
Cards left in deck: 23
Winner: Bob

Monte Carlo Simulation Results:

-----

Probability of the first player winning: 0.0
Probability of picking the first active Pokemon at the first attempt: 1.0
Probability of having at least one Enlightened Pokemon: 0.0
```

10,000 runs

```
--> Alice took AttackTrainer
--> Alice added AttackTrainer to prize
Cards left in deck: 2
Forcing a fight...

-----> EnlightenedPokemon vs EnlightenedPokemon <-----
Opponent's fighter:
[ EnlightenedPokemon:, HP: 999626/1000000, Attack: 62, Defense: 61 ]
--> Bob took Charmander
Cards left in deck: 2
Forcing a fight...

-----> EnlightenedPokemon vs EnlightenedPokemon <-----
Opponent's fighter:
[ EnlightenedPokemon:, HP: 999798/1000000, Attack: 50, Defense: 64 ]
--> Alice took Squirtle
Cards left in deck: 1
Forcing a fight...

-----> EnlightenedPokemon vs EnlightenedPokemon <-----
Opponent's fighter:
[ EnlightenedPokemon:, HP: 999604/1000000, Attack: 62, Defense: 61 ]
--> Bob took Squirtle
Cards left in deck: 1
Forcing a fight...

-----> EnlightenedPokemon vs EnlightenedPokemon <-----
Opponent's fighter:
[ EnlightenedPokemon:, HP: 999794/1000000, Attack: 50, Defense: 64 ]
--> Alice took Squirtle
Cards left in deck: 0
Forcing a fight...

-----> EnlightenedPokemon vs EnlightenedPokemon <-----
Opponent's fighter:
[ EnlightenedPokemon:, HP: 999582/1000000, Attack: 62, Defense: 61 ]
Winner: Alice

Monte Carlo Simulation Results:

-----
Probability of the first player winning: 0.5043
Probability of picking the first active Pokemon at the first attempt: 0.9787
Probability of having at least one Enlightened Pokemon: 0.5865
```

Manual game

```
Enter the first player's name: Alice
Enter the second player's name: Bob

----- S E T U P (Bob) -----
Bob didn't get a pokemon! Their hand:
{

}
Bob returned their cards to the deck...
Bob got a pokemon!
Bob has set aside the prize cards!
-----

----- S E T U P (Alice) -----
Alice got a pokemon!
Alice has set aside the prize cards!
-----

Your turn, Alice, choose your action:
1. Attack
2. View Active Pokemon
3. View Bench
4. View Prize
5. Change Active Pokemon
6. Draw card
7. Finish move
Your choice: |
```

Your choice: 2

[Bulbasaur:, HP: 35/35, Attack: 77, Defense: 18]

Your turn, Alice, choose your action:

1. Attack
2. View Active Pokemon
3. View Bench
4. View Prize
5. Change Active Pokemon
6. Draw card
7. Finish move

Your choice: 3

^^^^ Bench ^^^^^

^^^^^^^^^^^^^^^^^^^^

Your turn, Alice, choose your action:

1. Attack
2. View Active Pokemon
3. View Bench
4. View Prize
5. Change Active Pokemon
6. Draw card
7. Finish move

Your choice:

Your choice: 4

>>>> Prize <<<<

1. (WaterEnergy)
2. (WaterEnergy)
3. (HealTrainer)

<<<<<<<<<<<<<<<<<<<<<<

Your turn, Alice, choose your action:

1. Attack
2. View Active Pokemon
3. View Bench
4. View Prize
5. Change Active Pokemon
6. Draw card
7. Finish move

Your choice: 5

The bench is empty!

Your choice: 6

--> Alice took LightningEnergy

--> Alice added LightningEnergy to prize

Cards left in deck: 23

Forcing a fight...

-----> Bulbasaur vs Squirtle <-----

Opponent's fighter:

[Squirtle:, HP: 79/79, Attack: 74, Defense: 73]

Your turn, Bob, choose your action:

1. Attack
2. View Active Pokemon
3. View Bench
4. View Prize
5. Change Active Pokemon
6. Draw card
7. Finish move

Your choice: 6

--> Bob took WaterEnergy

--> Bob added WaterEnergy to prize

Cards left in deck: 24

Forcing a fight...

-----> Squirtle vs Bulbasaur <-----

Opponent's fighter:

[Bulbasaur:, HP: 35/35, Attack: 77, Defense: 18]

Changing Active Pokemon

Your choice: 3

^^^^ Bench ^^^^^

1. [Charmander:, HP: 39/39, Attack: 25, Defense: 65]

^^^^^^^^^^^^^^^^^^^^

Your turn, Alice, choose your action:

1. Attack
2. View Active Pokemon
3. View Bench
4. View Prize
5. Change Active Pokemon
6. Draw card
7. Finish move

Your choice: 5

Select a new active pokemon:

^^^^ Bench ^^^^^

1. [Charmander:, HP: 39/39, Attack: 25, Defense: 65]

^^^^^^^^^^^^^^^^^^^^

Your choice: 1

--> New active pokemon: [Charmander:, HP: 39/39, Attack: 25, Defense: 65]