DICE SIMULATION Project

INSTRUCTION BEFORE RUNNING THE PROJECT:

Please configure the database as per your requirement in "*application.properties*" file.

Contents:

A) ABOUT REST ENDPOINTS:

For the given Java assignment, making sensible assumptions, total 3 REST end points are created.

All the REST end points are being exposed in the "ApplicationController" file.

Dice\src\main\java\com\synpulse\controller\ApplicationController.java

1st end point:

@GetMapping("/simulate/{noOfDice}/{noOfSides}/{noOfRolls}")

This is for the assignment->Create a REST endpoint to execute a dice distribution simulation.

Here we can configure noOfDice, noOfSides and noOfRolls and Validations has been written as required.

A sample call from Postman: http://localhost:8080/simulate/5/8/120

Here 5->No of Dice, 8-> No of Sides, 120->No of Rolls

This returns a JSON of SUM-COUNT pairs.

sample output:


```
{
   "7": 1,
   "10": 1,
   "12": 2,
   "13": 1,
   "15": 4,
   "16": 7,
   "17": 1,
   "18": 8,
   "19": 8,
   "20": 3,
   "21": 6,
   "22": 13,
   "23": 10,
   "24": 6,
   "25": 6,
   "26": 11,
   "27": 8,
   "28": 4,
   "29": 5,
   "30": 5,
   "31": 3,
   "32": 3,
   "33": 2,
   "34": 1,
   "35": 1
}
```

2nd end point:

@GetMapping("/totaldetails")

This is for the assignment->Return the total number of simulations and total rolls made, grouped by all existing dice number–dice side combinations.

A sample call from Postman:

http://localhost:8080/totaldetails

This returns the required details of all the existing combinations as a ResponseEntity<String>

Sample Output:

DiceNumber-DiceSide	No-Of-Simulations	Total-Rolls
3-6	2	300
4-10	3	900
5-8	2	220

3rd end point:

@GetMapping("/relativedistribution/{noOfDice}/{noOfSides}")

This is for the assignment->For a given dice number–dice side combination, return the relative distribution, compared to the total rolls, for all

the simulations.

A sample call from Postman:

http://localhost:8080/relativedistribution/5/8

here 5->noOfDice and 8-> noOfSides

This returns the required details for the given diceNumber–diceSide combination as a ResponseEntity<String>

Sample Output:

Total rolls for the 5-8 diceNumber-diceSides combination is 220

Sum-on-Dice	Count-of-Sum	Relative-Distribution
12	4	1.82%
17	2	0.91%
29	7	3.18%
34	2	0.91%
26	22	10.00%
31	3	1.36%
32	7	3.18%
18	11	5.00%
30	6	2.73%
28	8	3.64%
15	7	3.18%
22	21	9.55%
27	11	5.00%
11	1	0.45%
24	12	5.45%
7	1	0.45%
21	12	5.45%
25	19	8.64%
38	1	0.45%
10	2	0.91%
33	4	1.82%
23	15	6.82%
19	14	6.36%
16	10	4.55%
14	1	0.45%
35	1	0.45%

13	3	1.36%
20	13	5.91%

B) About Database Design:

Based on the requirement for the assignment, I have created 2 tables. Hence there are 2 Models and 2 repositories in the Project.

First table is SIMULATION and the other is DISTRIBUTION and these two tables are linked by a "SimulationId".

Simulation table: This table is to store the total number of simulations and total number of rolls for a specific diceNumber-diceSide combination. This table has the following columns

1. *simulation_id* (Id given for a specific DiceNumber- diceSide combination).

2. *dice_side* (This is a string which is specific DiceNumber- diceSide combination).

3. s*imulation_count* (This is total number of simulations for the specific dice_side combination)

4.*total_rolls* (Total number of rolls for the specific dice_side combination).

Distribution table :This table is to store the Sum on dice and the number of times it occurs for a specific diceNumber-diceSide combination. This table has following columns:

1. *Id* (It's just a generated id)
2. *count* (gives he count of a a specific Sum on the dice for a specific diceNumber-diceSide combination)
3. *sum_on_dice* (represents Sum on the dice for a specific diceNumber-diceSide combination)
4. *simulation_id* (Id that connects with Simulation table. Basically each diceNumber-diceSide combination will have a simulationId).

C)**SimulationService.java**: It is the important class where entire functionalities are written.

Three different functions are written here, each corresponding to a REST endpoint.