

Core

1. Write a function to check if a string is a palindrome. The function should ignore all spaces and punctuation like “.”, “!”, “?”. Example sentence with punctuation: "Madam, in Eden, I'm Adam."
2. Write a function that takes in a number and performs the sum of its digits until a single digit remains.

Example: 8993 should return 2

8993 => 8+9+9+3 = 29

29 => 2+9 = 11

11 => 1+1 = 2

2

3. Write a function that checks if a sequence of brackets like: “{[(())]}” is valid or not.
4. Given a string path, which is an absolute path (starting with /) for a file or directory in a Unix-style file system, simplify it. The simplified canonical path should follow these rules:
 - A single dot "." refers to the current directory.
 - A double dot ".." refers to the parent directory.
 - Multiple slashes "/" are treated as a single slash '/'.
 - The simplified path should always start with a single slash '/'.
 - There should be no trailing slash at the end unless it's the root /.
 - You must resolve "." and ".." properly.

Return the simplified canonical path as a string.

SQL

```
CREATE TABLE departments (  
  department_id INT PRIMARY KEY,  
  name VARCHAR(100) NOT NULL,  
  location VARCHAR(100)  
);
```

```
CREATE TABLE employees (  
  employee_id INT PRIMARY KEY,  
  name VARCHAR(100) NOT NULL,  
  salary DECIMAL(10,2),  
  department_id INT,  
  email VARCHAR(255),  
  FOREIGN KEY (department_id) REFERENCES departments(department_id)  
);
```

GIVEN A DATABASE WITH THE ABOVE TABLES:

1. Find the average salary of all employees.
2. Find the details of employees whose salary is greater than the average salary of employees in the 'HR' department.
3. Find the details of employees whose email address is used by more than one employee.
4. Find employees who earn more than their department's average salary. (I don't clearly remember the fourth question)