

Challenge March-2024

Analyzing Employees

A solution with Python/ChatGPT 3.5 by Jack Jansonius – 15 May 2024

Question to ChatGPT 3.5:

I would like a python program that reads the following JSON code from the file Employees.json and answers the following questions:

1. What is the current total number of employees?
2. How many children do all employees have? How many children does the average employee have?
3. What is an average salary? What are the maximal and minimal salaries?
4. How many employees are single?
5. In which states do the employee have residences?
6. How many people are inside 20% of highest paid employees? Who are these high-paid employees?
7. List employees living in certain zip codes, as specified in "selectedZipCodes" in the json file.

Then added the request in JSON format; see Appendix A.

Answer:

Sure! Here's a Python program that reads the provided JSON data from the file Employees.json and answers the questions you've mentioned:

Generated Python code:

```
import json

# Read data from JSON file
with open('Employees.json') as f:
    data = json.load(f)

# Extract employees list
employees = data['company']['employees']

# Question 1: Total number of employees
total_employees = len(employees)

# Question 2: Number of children per employee and average
total_children = sum(emp['children'] for emp in employees)
average_children = total_children / total_employees

# Question 3: Average, maximal, and minimal salaries
salaries = [emp['salary'] for emp in employees]
average_salary = sum(salaries) / total_employees
max_salary = max(salaries)
min_salary = min(salaries)

# Question 4: Number of single employees
single_employees = sum(1 for emp in employees if emp['maritalStatus'] == 'Single')

# Question 5: States where employees have residences
residence_states = set()
for emp in employees:
    for loc in emp['locations']:
        residence_states.add(loc['state'])

# Question 6: Number and details of highest paid employees
sorted_employees = sorted(employees, key=lambda x: x['salary'], reverse=True)
twenty_percent = int(0.2 * total_employees)
high_paid_employees = sorted_employees[:twenty_percent]

# Question 7: Employees living in selected zip codes
selected_zip_codes = data['company']['selectedZipCode']
employees_in_selected_zips = [emp for emp in employees for loc in emp['locations']
if loc['zipCode'] in selected_zip_codes]

# Output answers
print("1. Total number of employees:", total_employees)
print("2. Total children:", total_children)
print("   Average children per employee:", average_children)
print("3. Average salary:", average_salary)
print("   Maximal salary:", max_salary)
print("   Minimal salary:", min_salary)
print("4. Number of single employees:", single_employees)
print("5. States where employees have residences:", residence_states)
print("6. Number of employees inside 20% of highest paid employees:",
twenty_percent)
print("   Details of high-paid employees:")
for emp in high_paid_employees:
    print("     - Name:", emp['name'], "| Salary:", emp['salary'])
print("7. Employees living in selected zip codes:",
len(employees_in_selected_zips))
for emp in employees_in_selected_zips:
    print("     - Name:", emp['name'], "| Zip Codes:", [loc['zipCode'] for loc in
emp['locations'] if loc['zipCode'] in selected_zip_codes])
```

Output:

1. Total number of employees: 12
2. Total children: 17
Average children per employee: 1.4166666666666667
3. Average salary: 134583.33333333334
Maximal salary: 220000.0
Minimal salary: 40000.0
4. Number of single employees: 5
5. States where employees have residences: {'NJ', 'CA', 'FL'}
6. Number of employees inside 20% of highest paid employees: 2
Details of high-paid employees:
 - Name: Robinson | Salary: 220000.0
 - Name: Doe | Salary: 210000.0
7. Employees living in selected zip codes: 4
 - Name: Warner | Zip Codes: ['08817']
 - Name: Stevens | Zip Codes: ['08817']
 - Name: Smith | Zip Codes: ['90027']
 - Name: Doe | Zip Codes: ['90027']

Output in semi JSON format¹:

```
{
  "1. Total number of employees": 12,
  "2. Total children": 17,
  "  Average children per employee": 1.4166666666666667,
  "3. Average salary": 134583.33333333334,
  "  Maximal salary": 220000.0,
  "  Minimal salary": 40000.0,
  "4. Number of single employees": 5,
  "5. States where employees have residences": [
    "FL",
    "CA",
    "NJ"
  ],
  "6. Number of employees inside 20% of highest paid employees": 2,
  "  Details of high-paid employees": [
    {
      "name": "Robinson",
      "salary": 220000.0
    },
    {
      "name": "Doe",
      "salary": 210000.0
    }
  ],
  "7. Employees living in selected zip codes": [
    {
      "name": "Warner",
      "zipCodes": [
        "08817"
      ]
    },
    {
      "name": "Stevens",
      "zipCodes": [
        "08817"
      ]
    },
    {
      "name": "Smith",
      "zipCodes": [
        "90027"
      ]
    },
    {
      "name": "Doe",
      "zipCodes": [
        "90027"
      ]
    }
  ]
}
```

¹ After questioning ChatGPT: Is it also possible to return the answers in json format?

Appendix A: Test file 'Employees.json'

```
{
  "company" : {
    "companyName" : "ABC",
    "employees" : [ {
      "name" : "Robinson",
      "age" : 25,
      "gender" : "Female",
      "maritalStatus" : "Married",
      "minor" : false,
      "locations" : [ {
        "id" : "RobinsonLoc1",
        "street" : "Main Str",
        "zipCode" : "08831",
        "state" : "NJ"
      }, {
        "id" : "RobinsonLoc2",
        "street" : "Ocean Drive",
        "zipCode" : "33019",
        "state" : "FL"
      } ],
      "children" : 2,
      "salary" : 220000.0
    }, {
      "name" : "Warner",
      "age" : 45,
      "gender" : "Male",
      "maritalStatus" : "Married",
      "minor" : false,
      "locations" : [ {
        "id" : "WarnerLoc",
        "street" : "Maple Street",
        "zipCode" : "08817",
        "state" : "NJ"
      } ],
      "children" : 0,
      "salary" : 150000.0
    }, {
      "name" : "Stevens",
      "age" : 24,
      "gender" : "Male",
      "maritalStatus" : "Single",
      "minor" : false,
      "locations" : [ {
        "id" : "StevensLoc",
        "street" : "Regency Drive",
        "zipCode" : "08817",
        "state" : "NJ"
      } ],
      "children" : 0,
      "salary" : 135000.0
    }, {
      "name" : "White",
      "age" : 32,
      "gender" : "Female",
      "maritalStatus" : "Married",
      "minor" : false,
      "locations" : [ {
        "id" : "WhiteLoc",
        "street" : "Green Road",
        "zipCode" : "33019",
        "state" : "FL"
      } ],
      "children" : 2,
      "salary" : 195000.0
    }, {
```

```

    "name" : "Smith",
    "age" : 46,
    "gender" : "Male",
    "maritalStatus" : "Single",
    "minor" : false,
    "locations" : [ {
        "id" : "SmithLoc",
        "street" : "Maple Street",
        "zipCode" : "90027",
        "state" : "CA"
    } ],
    "children" : 1,
    "salary" : 120000.0
}, {
    "name" : "Green",
    "age" : 28,
    "gender" : "Female",
    "maritalStatus" : "Married",
    "minor" : false,
    "locations" : [ {
        "id" : "GreenLoc",
        "street" : "Green Road",
        "zipCode" : "33019",
        "state" : "FL"
    } ],
    "children" : 3,
    "salary" : 140000.0
}, {
    "name" : "Brown",
    "age" : 32,
    "gender" : "Male",
    "maritalStatus" : "Married",
    "minor" : false,
    "locations" : [ {
        "id" : "BrownLoc",
        "street" : "Green Road",
        "zipCode" : "33019",
        "state" : "FL"
    } ],
    "children" : 2,
    "salary" : 65000.0
}, {
    "name" : "Klaus",
    "age" : 54,
    "gender" : "Male",
    "maritalStatus" : "Married",
    "minor" : false,
    "locations" : [ {
        "id" : "KlausLoc",
        "street" : "Green Road",
        "zipCode" : "33019",
        "state" : "FL"
    } ],
    "children" : 1,
    "salary" : 85000.0
}, {
    "name" : "Houston",
    "age" : 47,
    "gender" : "Female",
    "maritalStatus" : "Single",
    "minor" : false,
    "locations" : [ {
        "id" : "HoustonLoc",
        "street" : "Green Road",
        "zipCode" : "33019",
        "state" : "FL"
    } ],
    "children" : 2,

```

```

    "salary" : 135000.0
  }, {
    "name" : "Long",
    "age" : 29,
    "gender" : "Male",
    "maritalStatus" : "Married",
    "minor" : false,
    "locations" : [ {
      "id" : "LongLoc",
      "street" : "Green Road",
      "zipCode" : "33019",
      "state" : "FL"
    } ],
    "children" : 3,
    "salary" : 40000.0
  }, {
    "name" : "Short",
    "age" : 22,
    "gender" : "Male",
    "maritalStatus" : "Single",
    "minor" : false,
    "locations" : [ {
      "id" : "ShortLoc",
      "street" : "Green Road",
      "zipCode" : "33019",
      "state" : "FL"
    } ],
    "children" : 0,
    "salary" : 120000.0
  }, {
    "name" : "Doe",
    "age" : 21,
    "gender" : "Female",
    "maritalStatus" : "Single",
    "minor" : false,
    "locations" : [ {
      "id" : "DoeLoc1",
      "street" : "Green Road",
      "zipCode" : "33019",
      "state" : "FL"
    }, {
      "id" : "DoeLoc2",
      "street" : "Morgan Street",
      "zipCode" : "33020",
      "state" : "FL"
    }, {
      "id" : "DoeLoc3",
      "street" : "Lyric Ave",
      "zipCode" : "90027",
      "state" : "CA"
    } ],
    "children" : 1,
    "salary" : 210000.0
  } ],
  "selectedZipCode" : [ "08817", "90027" ]
}

```