

# 山东大学 计算机科学与技术 学院

## 大数据分析实践 课程实验报告

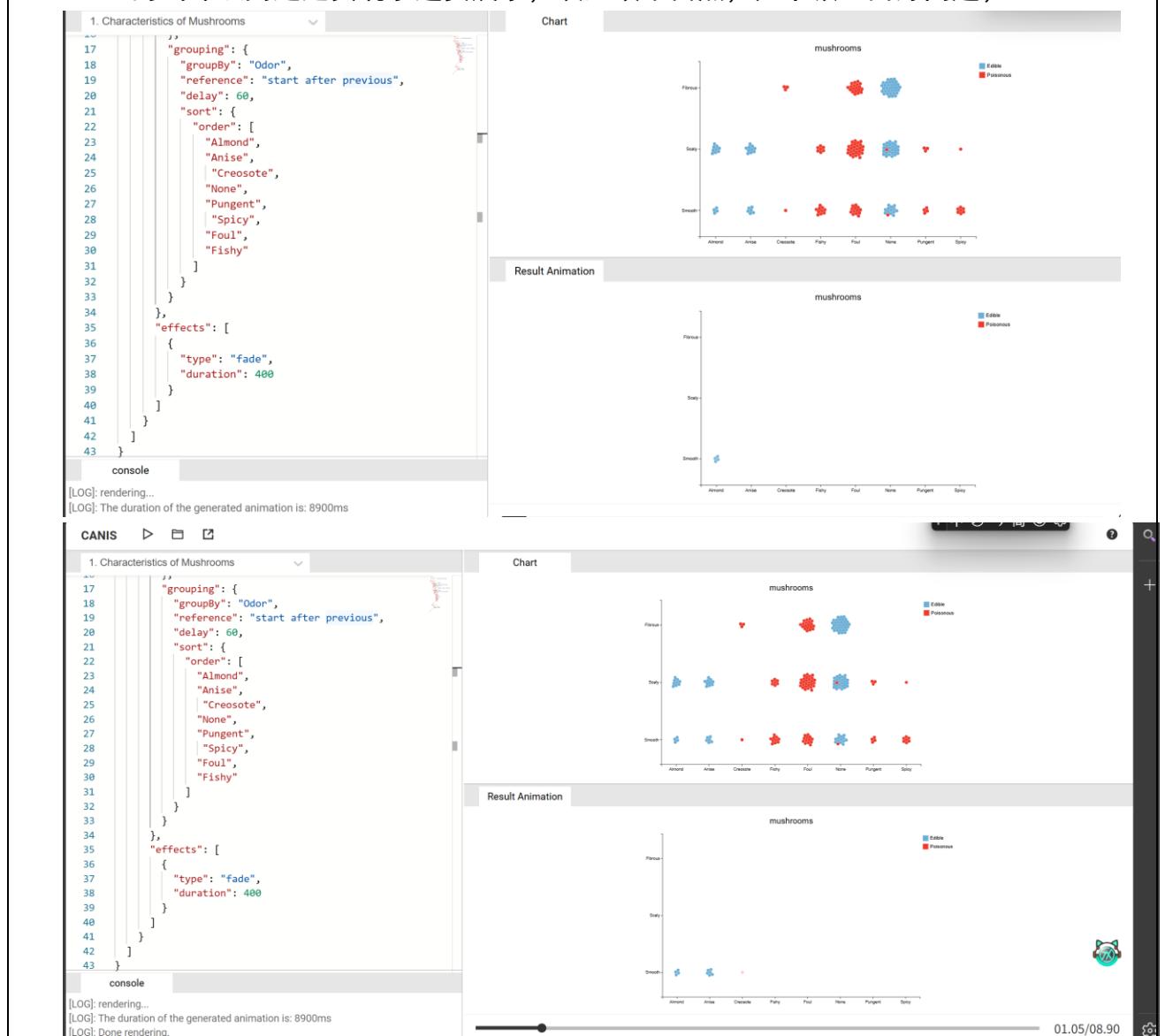
学号: 202300130178	姓名: 刘爽	班级: 23 数据		
实验题目: 蘑菇数据可视化图表分组渐入动画实践实验				
实验学时: 4	实验日期: 2025.10.23			
实验目的:				
1. 掌握可视化图表中元素分组动画的配置方法，成功实现蘑菇数据图表的有序渐入效果； 2. 理解嵌套分组动画的执行逻辑，学会按数据属性分层配置动画触发顺序与延迟参数； 3. 验证动画配置参数的有效性，提升个人在数据可视化动画设计与实践中的操作能力。				
实验环境:				
1. 数据文件: 蘑菇数据矢量图表 ( <code>./charts/mushrooms.dsvg</code> )； 2. 配置工具: 支持 DSVG 格式解析与分组动画配置的可视化编辑工具； 3. 运行环境: 浏览器 (Chrome/Firefox)。				
实验原理与配置:				
本次实验核心是通过配置文件指定动画规则，让图表中匹配 “.symbol” 的元素按预设分组顺序渐入显示。采用双层嵌套分组策略：先按蘑菇“表面特征 (Surface)” 分组，再在每个表面特征分组内按“气味 (Odor)” 细分，通过设置延迟参数保证动画有序流畅，最终通过“淡入 (fade)” 效果呈现动画。				
(一) 核心配置内容解析				
1. 图表源配置: 指定使用本地的蘑菇数据 DSVG 文件，确保动画载体正确加载； 2. 动画目标: 通过 “selector: '.symbol'” 选中图表中所有蘑菇数据标记元素； 3. 嵌套分组规则: <ul style="list-style-type: none"><li>◦ 第一层 (表面特征): 按[Smooth (光滑)、Scaly (鳞片状)、Fibrous (纤维状)]顺序分组，组间延迟 400ms，上一组动画完成后下一组启动；</li><li>◦ 第二层 (气味): 在每个表面特征分组内，按指定 8 种气味顺序细分，组间延迟 60ms，同样按“上一组完成后启动下一组”规则执行；</li></ul>				
4. 动画效果: 采用淡入效果，单个元素动画持续 400ms。				
实验步骤与结果:				
1. 准备阶段: 检查蘑菇数据 DSVG 文件完整性，确认文件路径正确，确保浏览器能正常访问该文件；				
<pre>"charts": [     {         "source": "./charts/mushrooms.dsvg"     } ,</pre>				

2. 配置编写：参照实验要求，编写 JSON 格式动画配置文件，明确图表源、分组规则、延时参数及动画效果，核对分组顺序和参数数值；

```
"selector": ".symbol",
"grouping": {
    "reference": "start after previous",
    "groupBy": "Surface",
    "delay": 400,
    "sort": {
        "order": ["Smooth", "Scaly", "Fibrous"]
    },
    "grouping": {
        "groupBy": "Odor",
        "reference": "start after previous",
        "delay": 60,
        "sort": {
            "order": [
                "Almond",
                "Anise",
                "Creosote",
                "None",
                "Pungent",
                "Spicy",
                "Foul",
                "Fishy"
            ]
        }
    }
},
```

3. 环境部署：将配置文件与 DSVG 文件放在同一项目目录下，在浏览器中打开项目入口文件，加载配置与图表；  
4. 动画执行正常：图表中蘑菇元素严格按“表面特征（Smooth→Scaly→Fibrous）”分组，每个分组内按预设气味顺序依次淡入，无顺序错乱现象；

5. 动画效果流畅：组间延迟参数设置合理，400ms 的表面特征组间延迟保证了分组区分度，60ms 的气味组间延迟实现了连贯展示，淡入效果自然，无卡顿、闪烁问题；



**CANIS**

1. Characteristics of Mushrooms

```

17   "grouping": {
18     "groupBy": "Odor",
19     "reference": "start after previous",
20     "delay": 60,
21     "sort": {
22       "order": [
23         "Almond",
24         "Anise",
25         "Creosote",
26         "None",
27         "Pungent",
28         "Spicy",
29         "Foul",
30         "Fishy"
31       ]
32     }
33   },
34   "effects": [
35     {
36       "type": "fade",
37       "duration": 400
38     }
39   ]
40 }
41 ]
42 ]
43 }

```

console

[LOG]: rendering...  
[LOG]: The duration of the generated animation is: 8900ms  
[LOG]: Done rendering.

Chart

Result Animation

01.30/08.90

**CANIS**

1. Characteristics of Mushrooms

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17   "grouping": {
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30         "Fishy"
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32     }
33   },
34   "effects": [
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36       "type": "fade",
37       "duration": 400
38     }
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43 }

```

console

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Chart

Result Animation

01.85/08.90

**CANIS**

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30         "Fishy"
31       ]
32     }
33   },
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36       "type": "fade",
37       "duration": 400
38     }
39   ]
40 }
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43 }

```

console

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Chart

Result Animation

02.25/08.90

**CANIS**

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25           "Creosote",
26           "None",
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28           "Spicy",
29           "Foul",
30           "Fishy"
31         ]
32       }
33     },
34   },
35   "effects": [
36     {
37       "type": "fade",
38       "duration": 400
39     }
40   ]
41 }
42 ]
43 }
```

console

LOG: rendering...  
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Chart

Result Animation

02.75/08.90

**CANIS**

1. Characteristics of Mushrooms

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28           "Spicy",
29           "Foul",
30           "Fishy"
31         ]
32       }
33     },
34   },
35   "effects": [
36     {
37       "type": "fade",
38       "duration": 400
39     }
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```

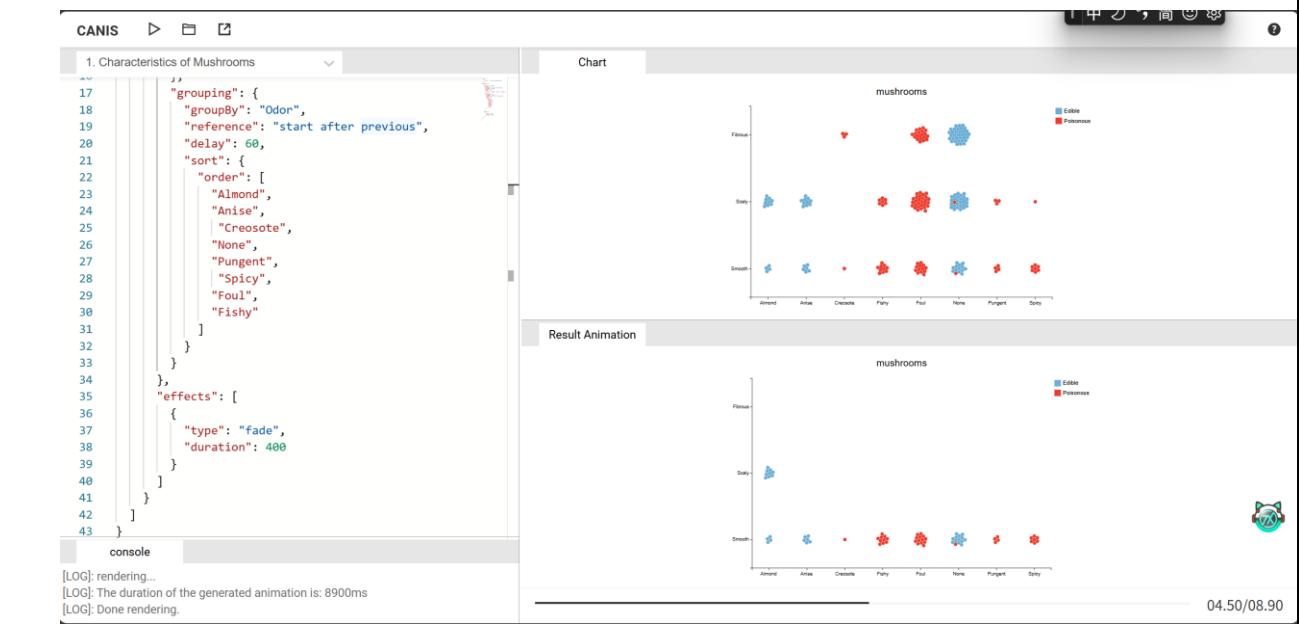
console

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Chart

Result Animation

03.25/08.90



**CANIS**

1. Characteristics of Mushrooms

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Chart

Result Animation

04.90/08.90

**CANIS**

1. Characteristics of Mushrooms

```

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20       "delay": 60,
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25           "Creosote",
26           "None",
27           "Pungent",
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29           "Foul",
30           "Fishy"
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41 }
42 }
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```

console

[LOG]: rendering...  
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[LOG]: Done rendering.

Chart

Result Animation

05.45/08.90

**CANIS**

1. Characteristics of Mushrooms

```

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19       "reference": "start after previous",
20       "delay": 60,
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24           "Anise",
25           "Creosote",
26           "None",
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28           "Spicy",
29           "Foul",
30           "Fishy"
31         ]
32       }
33     },
34   },
35   "effects": [
36     {
37       "type": "fade",
38       "duration": 400
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41 }
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```

console

[LOG]: rendering...  
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Chart

Result Animation

05.85/08.90

https://canisjs.github.io/canis-editor/

### CANIS

1. Characteristics of Mushrooms

```

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26           "None",
27           "Pungent",
28           "Spicy",
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[LOG]: rendering...  
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[LOG]: Done rendering.

Chart

Result Animation

截图工具

屏幕截图已复制到剪贴板  
已自动保存到屏幕截图文件夹。

标记和共享

06.85/08.90

CANIS

```

1. Characteristics of Mushrooms
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Chart

Result Animation

07.20/08.90

[LOG]: rendering...
[LOG]: The duration of the generated animation is: 8900ms
[LOG]: Done rendering.

CANIS

```

1. Characteristics of Mushrooms
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```

Chart

Result Animation

08.05/08.90

[LOG]: rendering...
[LOG]: The duration of the generated animation is: 8900ms
[LOG]: Done rendering.



## 6. 目标达成：成功实现了分组渐入动画，清晰呈现了不同表面特征、不同气味蘑菇的数据分布，达到实验预设目的。

### 实验结论：

#### (一) 实验总结

本次实验通过实践掌握了数据可视化分组动画的配置方法，验证了嵌套分组策略的有效性。实验过程中，准确的配置编写和参数设置是动画成功执行的关键，尤其是分组顺序和延迟参数的调整，直接影响动画的可读性和流畅度。

#### (二) 实验体会

通过本次实验，我深入理解了“数据分组+有序动画”在可视化中的价值，不仅提升了 JSON 配置文件的编写能力，也学会了排查动画执行中的基础问题（如路径错误、参数拼写错误等）。同时认识到，数据可视化动画的设计需兼顾逻辑性与体验感，合理的分组和参数设置能让数据展示更清晰易懂。后续可进一步尝试调整参数，探索不同参数对动画效果的影响。