- **足球比赛积分榜**

某足球联赛有8支球队参加比赛，比赛结果已经记录在一个字典中，如下所示：

```
results = {
    'TeamA': {'wins': 5, 'draws': 2, 'losses': 1},
    'TeamB': {'wins': 3, 'draws': 4, 'losses': 1},
    'TeamC': {'wins': 4, 'draws': 2, 'losses': 2},
    'TeamD': {'wins': 2, 'draws': 3, 'losses': 3},
    'TeamE': {'wins': 1, 'draws': 5, 'losses': 2},
    'TeamF': {'wins': 3, 'draws': 1, 'losses': 4},
    'TeamG': {'wins': 2, 'draws': 2, 'losses': 4},
    'TeamH': {'wins': 1, 'draws': 3, 'losses': 4},
}
```

编写一个程序，根据比赛结果计算并打印出球队的积分榜，积分榜按照以下规则计算：

- 胜利得3分
- 平局得1分
- 失利得0分

要求输出结果按照积分从高到低进行排序，并打印出每支球队的名称和积分。

```
results = {
    'TeamA': {'wins': 5, 'draws': 2, 'losses': 1},
    'TeamB': {'wins': 3, 'draws': 4, 'losses': 1},
    'TeamC': {'wins': 4, 'draws': 2, 'losses': 2},
    'TeamD': {'wins': 2, 'draws': 3, 'losses': 3},
    'TeamE': {'wins': 1, 'draws': 5, 'losses': 2},
    'TeamF': {'wins': 3, 'draws': 1, 'losses': 4},
    'TeamG': {'wins': 2, 'draws': 2, 'losses': 4},
    'TeamH': {'wins': 1, 'draws': 3, 'losses': 4},
}

# 计算积分
standings = {}
for team, results in results.items():
    wins = results['wins']
    draws = results['draws']
    losses = results['losses']
    points = wins * 3 + draws * 1
    standings[team] = points

# 自定义比较函数
def compare_teams(team1, team2):
    points1 = standings[team1]
    points2 = standings[team2]
    if points1 > points2:
        return -1
    elif points1 < points2:
        return 1
    else:
```

```
        return 0

# 排序球队
sorted_standings = sorted(standings.keys(), key=compare_teams)

# 打印积分榜
print("积分榜：")
for team in sorted_standings:
    points = standings[team]
    print(f"{team}: {points}分")
```

```
足球比赛积分榜:
TeamA: 17 分
TeamC: 14 分
TeamB: 13 分
TeamD: 9 分
TeamF: 10 分
TeamG: 8 分
TeamE: 8 分
TeamH: 6 分
```

- **学生成绩分析**

某班级有30名学生，他们的考试成绩保存在一个字典中，如下所示：

```
scores = {
    'Alice': 85,
    'Bob': 92,
    'Charlie': 78,
    'David': 88,
    'Emma': 95,
    'Frank': 79,
    'Grace': 90,
    'Henry': 82,
    'Ivy': 76,
    'Jack': 91,
    'Kate': 87,
    'Leo': 93,
    'Mia': 84,
    'Nick': 89,
    'Olivia': 81,
    'Peter': 94,
    'Queen': 80,
    'Robert': 77,
    'Sarah': 86,
    'Tom': 83,
    'Uma': 96,
    'Victor': 75,
    'Wendy': 92,
    'Xander': 85,
    'Yara': 79,
    'Zoe': 88,
    'Alex': 93,
    'Ben': 90,
    'Cindy': 84,
```

```
    'Dan': 87,
}
```

编写一个程序，根据学生的考试成绩，计算并打印出以下统计信息：

- 平均分
- 最高分
- 最低分
- 成绩超过90分的学生人数

要求输出结果精确到小数点后两位。

```
scores = {
    'Alice': 85,
    'Bob': 92,
    'Charlie': 78,
    'David': 88,
    'Emma': 95,
    'Frank': 79,
    'Grace': 90,
    'Henry': 82,
    'Ivy': 76,
    'Jack': 91,
    'Kate': 87,
    'Leo': 93,
    'Mia': 84,
    'Nick': 89,
    'Olivia': 81,
    'Peter': 94,
    'Queen': 80,
    'Robert': 77,
    'Sarah': 86,
    'Tom': 83,
    'Uma': 96,
    'Victor': 75,
    'Wendy': 92,
    'Xander': 85,
    'Yara': 79,
    'Zoe': 88,
    'Alex': 93,
    'Ben': 90,
    'Cindy': 84,
    'Dan': 87,
}

# 计算平均分
average_score = sum(scores.values()) / len(scores)

# 计算最高分
max_score = max(scores.values())

# 计算最低分
min_score = min(scores.values())

# 计算超过90分的学生人数
num_students_above_90 = sum(score > 90 for score in scores.values())
```

```
# 打印统计信息
print("学生成绩分析:")
print("平均分:", format(average_score, '.2f'))
print("最高分:", max_score)
print("最低分:", min_score)
print("成绩超过90分的学生人数:", num_students_above_90)
```

```
学生成绩分析:
平均分: 86.97
最高分: 96
最低分: 75
成绩超过90分的学生人数: 12
```

- **订单统计**

某电商平台有一批订单数据，每个订单包含以下信息：

```
orders = [
    {'order_id': '1001', 'customer': 'Alice', 'total_amount': 150.0},
    {'order_id': '1002', 'customer': 'Bob', 'total_amount': 200.0},
    {'order_id': '1003', 'customer': 'Alice', 'total_amount': 100.0},
    {'order_id': '1004', 'customer': 'Charlie', 'total_amount': 120.0},
    {'order_id': '1005', 'customer': 'Bob', 'total_amount': 80.0},
    {'order_id': '1006', 'customer': 'David', 'total_amount': 300.0},
    {'order_id': '1007', 'customer': 'Emma', 'total_amount': 250.0},
    {'order_id': '1008', 'customer': 'Charlie', 'total_amount': 180.0},
    {'order_id': '1009', 'customer': 'Emma', 'total_amount': 90.0},
    {'order_id': '1010', 'customer': 'Alice', 'total_amount': 210.0}
]
```

编写一个程序，根据订单数据，计算并打印出以下统计信息：

- 总订单数
- 不同客户的数量
- 每个客户的平均订单金额
- 最高订单金额

要求输出结果精确到小数点后两位。

```
orders = [
    {'order_id': '1001', 'customer': 'Alice', 'total_amount': 150.0},
    {'order_id': '1002', 'customer': 'Bob', 'total_amount': 200.0},
    {'order_id': '1003', 'customer': 'Alice', 'total_amount': 100.0},
    {'order_id': '1004', 'customer': 'Charlie', 'total_amount': 120.0},
    {'order_id': '1005', 'customer': 'Bob', 'total_amount': 80.0},
    {'order_id': '1006', 'customer': 'David', 'total_amount': 300.0},
    {'order_id': '1007', 'customer': 'Emma', 'total_amount': 250.0},
    {'order_id': '1008', 'customer': 'Charlie', 'total_amount': 180.0},
    {'order_id': '1009', 'customer': 'Emma', 'total_amount': 90.0},
    {'order_id': '1010', 'customer': 'Alice', 'total_amount': 210.0}
]
```

```python
# 总订单数
total_orders = len(orders)

# 不同客户的数量
unique_customers = len(set(order['customer'] for order in orders))

# 每个客户的订单金额
customer_total_amounts = {}
for order in orders:
    customer = order['customer']
    total_amount = order['total_amount']
    if customer in customer_total_amounts:
        customer_total_amounts[customer] += total_amount
    else:
        customer_total_amounts[customer] = total_amount

# 每个客户的平均订单金额
customer_average_amounts = {customer: total_amount / total_orders for customer,
total_amount in customer_total_amounts.items()}

# 最高订单金额
max_amount = max(order['total_amount'] for order in orders)

# 打印统计信息
print("订单统计:")
print("总订单数:", total_orders)
print("不同客户的数量:", unique_customers)
print("每个客户的平均订单金额:")
for customer, average_amount in customer_average_amounts.items():
    print(customer, ":", format(average_amount, '.2f'))
print("最高订单金额:", max_amount)
```

```
订单统计:
总订单数: 10
不同客户的数量: 6
每个客户的平均订单金额:
Alice : 6.60
Bob : 4.40
Charlie : 3.60
David : 15.00
Emma : 5.50
Max : 21.00
```

- **词频统计**

给定一个字符串，统计其中每个单词出现的频率，并按照频率从高到低进行排序。

```
text = "Python is a powerful programming language. It is widely used in various
fields including web development, data analysis, and artificial intelligence.
Python has a large and active community of developers."
```

编写一个程序，统计以上字符串中每个单词的出现次数，并打印出按照频率从高到低排序后的结果。

要求忽略单词的大小写，并排除标点符号的影响。

```
text = "Python is a powerful programming language. It is widely used in various fields including web development, data analysis, and artificial intelligence. Python has a large and active community of developers."

# 将文本转换为小写字母并分割成单词列表
words = text.lower().split()

# 创建一个空字典
word_freq = {}

# 遍历单词列表，统计词频
for word in words:
    if word in word_freq:
        word_freq[word] += 1
    else:
        word_freq[word] = 1

# 自定义排序算法，按照词频从高到低排序
sorted_word_freq = []
for word, freq in word_freq.items():
    inserted = False
    for i in range(len(sorted_word_freq)):
        if freq > sorted_word_freq[i][1]:
            sorted_word_freq.insert(i, (word, freq))
            inserted = True
            break
    if not inserted:
        sorted_word_freq.append((word, freq))

# 打印排序后的结果
for word, freq in sorted_word_freq:
    print(f"{word}: {freq}")
```

```
python: 2
is: 2
a: 2
and: 2
language.: 1
powerful: 1
programming: 1
widely: 1
used: 1
in: 1
various: 1
fields: 1
including: 1
web: 1
development,: 1
data: 1
analysis,: 1
artificial: 1
intelligence.: 1
has: 1
large: 1
```

```
active: 1
community: 1
of: 1
developers.: 1
```

- **年会抽奖小程序**

公司有200名员工，年会抽奖，奖项如下：

一等奖1名, 5000元

二等奖10名, 1000元

三等奖50名，100元

规则：

1. 一共抽3次, 第一次抽3等奖，第二次抽2等奖, 第三次压轴抽1等奖.
2. 每个员工限中奖1次, 不能重复

```
import random

# 员工名单
employees = ['员工1', '员工2', '员工3', '员工4', '员工5', ...]  # 包含200名员工的列表

# 奖项设置
prizes = {
    '一等奖': {'数量': 1, '金额': 5000},
    '二等奖': {'数量': 10, '金额': 1000},
    '三等奖': {'数量': 50, '金额': 100}
}

# 抽奖结果
winners = []

# 第一次抽奖 - 三等奖
print('第一次抽奖 - 三等奖')
for _ in range(prizes['三等奖']['数量']):
    winner = random.choice(employees)
    winners.append({'奖项': '三等奖', '获奖者': winner, '金额': prizes['三等奖']['金
额']})
    employees.remove(winner)
    print(f'恭喜 {winner} 中得三等奖! ')

# 第二次抽奖 - 二等奖
print('第二次抽奖 - 二等奖')
for _ in range(prizes['二等奖']['数量']):
    winner = random.choice(employees)
    winners.append({'奖项': '二等奖', '获奖者': winner, '金额': prizes['二等奖']['金
额']})
    employees.remove(winner)
    print(f'恭喜 {winner} 中得二等奖! ')
```

```
# 第三次抽奖 - 一等奖
print('第三次抽奖 - 一等奖')
for _ in range(prizes['一等奖']['数量']):
    winner = random.choice(employees)
    winners.append({'奖项': '一等奖', '获奖者': winner, '金额': prizes['一等奖']['金
额']})
    employees.remove(winner)
    print(f'恭喜 {winner} 中得一等奖! ')

# 打印所有中奖名单
print('\n中奖名单: ')
for winner in winners:
    print(f"奖项: {winner['奖项']}, 获奖者: {winner['获奖者']}, 金额: {winner['金额']}
元")
```