Week3 Hw

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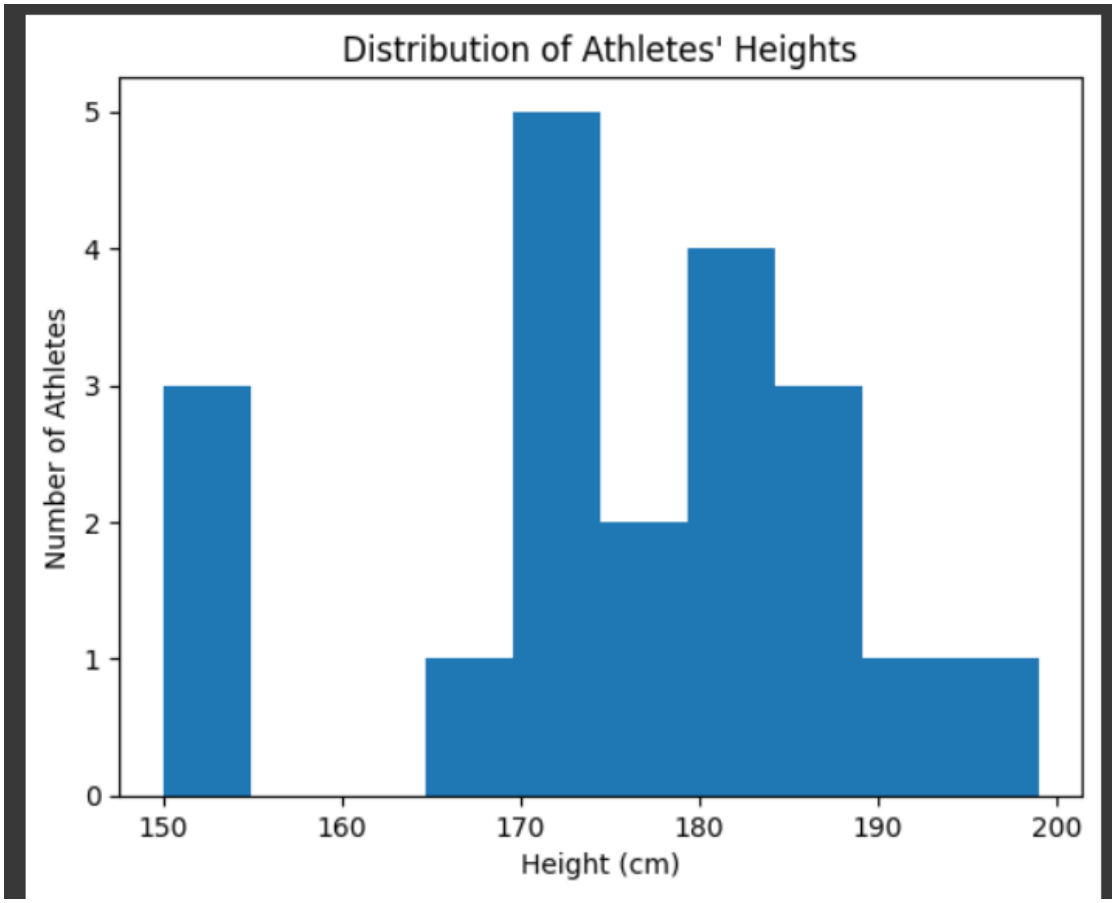
1. 請判斷下列資料集並用 Python 做出的直方圖及長條圖

直方圖:

根據所有人身高區分不同的區間

```
#  hw2-1
#  繪製直方圖
plt.hist(heights)

plt.xlabel('Height  (cm)')
plt.ylabel('Number  of  Athletes')
plt.title('Distribution  of  Athletes\'  Heights')

plt.show()
```

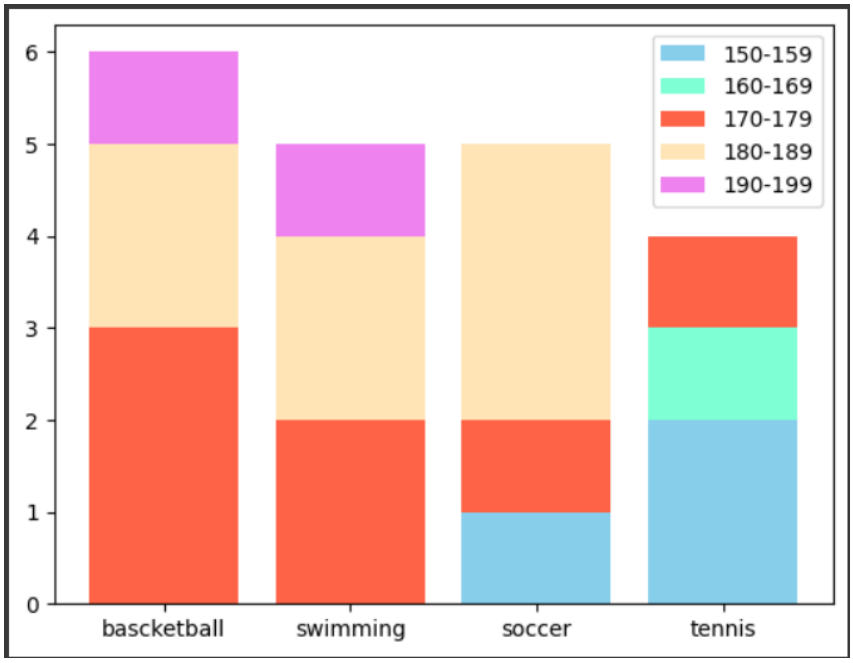


長條圖

區分出每種運動各自身高的分布區間累積人數畫出堆疊長條圖

```
heights = [182, 180, 190, 185, 171, 180, 170, 173, 154, 153,
                    166, 177, 188, 199, 186, 176, 184, 172, 172, 150]

sports = ['Basketball', 'swimming', 'Basketball', 'Soccer',
                  'Basketball', 'swimming', 'swimming', 'swimming',
                  'Tennis', 'Tennis', 'Tennis', 'Tennis',
                  'Soccer', 'swimming', 'Soccer', 'Soccer',
                  'Basketball', 'Basketball', 'Basketball', 'Soccer']

basketball_heights = []
swimming_heights = []
soccer_heights = []
tennis_heights = []

for i in range(len(heights)):
        if sports[i] == 'Basketball':
                basketball_heights.append(heights[i])
        elif sports[i] == 'swimming':
                swimming_heights.append(heights[i])
        elif sports[i] == 'Soccer':
                soccer_heights.append(heights[i])
        elif sports[i] == 'Tennis':
                tennis_heights.append(heights[i])

print('Basketball heights:', basketball_heights)
print('Swimming heights:', swimming_heights)
print('Soccer heights:', soccer_heights)
print('Tennis heights:', tennis_heights)
```

```
# [bascketball,swimming,soccer,tennis]
region_150 = np.array([0,0,1,2])
region_160 = np.array([0,0,0,1])
region_170 = np.array([3,2,1,1])
region_180 = np.array([2,2,3,0])
region_190 = np.array([1,1,0,0])

x = ['bascketball','swimming','soccer','tennis']
bottom_160 = region_150
bottom_170 = bottom_160 + region_160
bottom_180 = bottom_170 + region_170
bottom_190 = bottom_180 + region_180

plt.bar(x, region_150, label='150-159', color='skyblue')
plt.bar(x, region_160, bottom=bottom_160, label='160-169', color='aquamarine')
plt.bar(x, region_170, bottom=bottom_170, label='170-179', color='tomato')
plt.bar(x, region_180, bottom=bottom_180, label='180-189', color='moccasin')
plt.bar(x, region_190, bottom=bottom_190, label='190-199', color='violet')

plt.legend()    # 添加legend
plt.show()
```



2. 請依照下列資料集用 Python 做出 X,Y 的散佈圖

X=[1, 2, 3, 4, 5, 3, 4, 4, 8, 5]

Y=[5, 20, 7, 7, 10, 6, 7, 10, 8, 3]

```
#  hw2-2
plt.scatter(
        [1, 2, 3, 4, 5, 3, 4, 4, 8, 5],
        [5, 20, 7, 7, 10, 6, 7, 10, 8, 3]
)
plt.xlabel('X')
plt.ylabel('Y')
plt.show()
```