
python
import turtle
turtle.setup(650,350,200,200)
turtle.penup()
turtle.fd(-250)
turtle.pendown()
turtle.pensize(25)
turtle.pencolor("purple")
turtle.seth(-40)
for 1 in range(4):
turtle.circle(40, 80)
turtle.circle(-40, 80)
turtle.fd(40)
turtle.circle(40, 80/2)
turtle.fd(40)
turtle.circle(16, 180)
turtle.fd(40 * 2/3)

Python语言程序设计

实例5: 身体质量指数BMI

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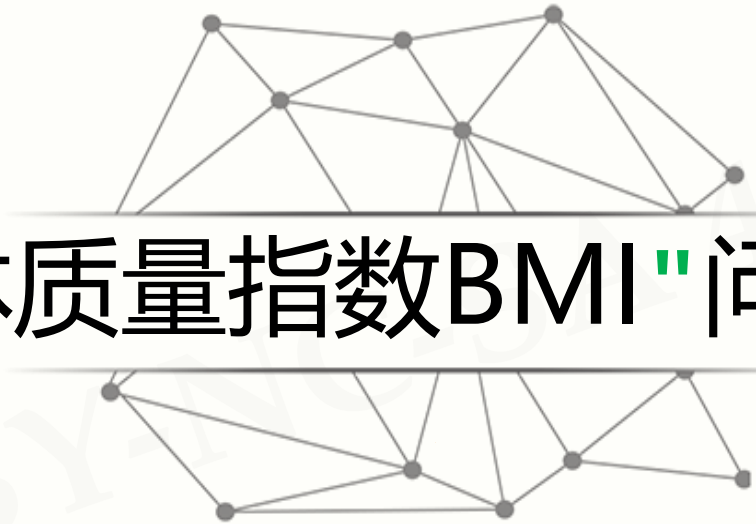


"身体质量指数BMI"问题分析

身体质量指数BMI

BMI：对身体质量的刻画

- **BMI：Body Mass Index**

  国际上常用的衡量人体肥胖和健康程度的重要标准，主要用于统计分析

- **定义**

$$\text{BMI} = \text{体重 (kg)} / \text{身高}^2\ (\text{m}^2)$$

身体质量指数BMI

BMI：对身体质量的刻画

- 实例：体重 72 kg 身高 1.75 m

  BMI 值是 23.5

- 这个值是否健康呢?

身体质量指数BMI

国际：世界卫生组织　国内：国家卫生健康委员会

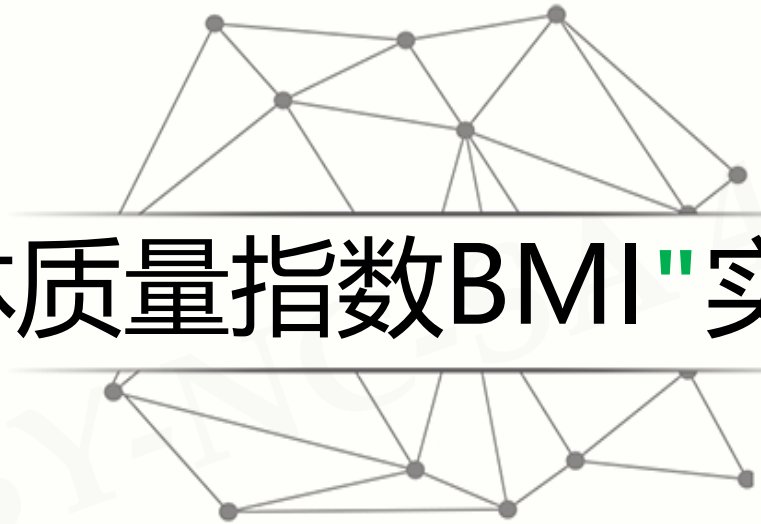
分类	国际BMI值 (kg/m^2)	国内BMI值 (kg/m^2)
偏瘦	<18.5	<18.5
正常	18.5 ~ 25	18.5 ~ 24
偏胖	25 ~ 30	24 ~ 28
肥胖	≥30	≥28

身体质量指数BMI

问题需求

PY01B17 变迁

- 输入：给定体重和身高值
- 输出：BMI指标分类信息(国际和国内)



"身体质量指数BMI"实例讲解

身体质量指标BMI

思路方法

- 难点在于同时输出国际和国内对应的分类
- 思路1：分别计算并给出国际和国内BMI分类
- 思路2：混合计算并给出国际和国内BMI分类

身体质量指标BMI

```
#CalBMIv1.py
height, weight = eval(input("请输入身高(米)和体重(公斤)[逗号隔开]: "))
bmi = weight / pow(height, 2)
print("BMI 数值为: {:.2f}".format(bmi))
who = ""
if bmi < 18.5:
    who = "偏瘦"
elif 18.5 <= bmi < 25:
    who = "正常"
elif 25 <= bmi < 30:
    who = "偏胖"
else:
    who = "肥胖"
print("BMI 指标为:国际'{0}'".format(who))
```

分类	国际BMI值	国内BMI值
偏瘦	<18.5	<18.5
正常	18.5 ~ 25	18.5 ~ 24
偏胖	25 ~ 30	24 ~ 28
肥胖	≥30	≥28

身体质量指标BMI

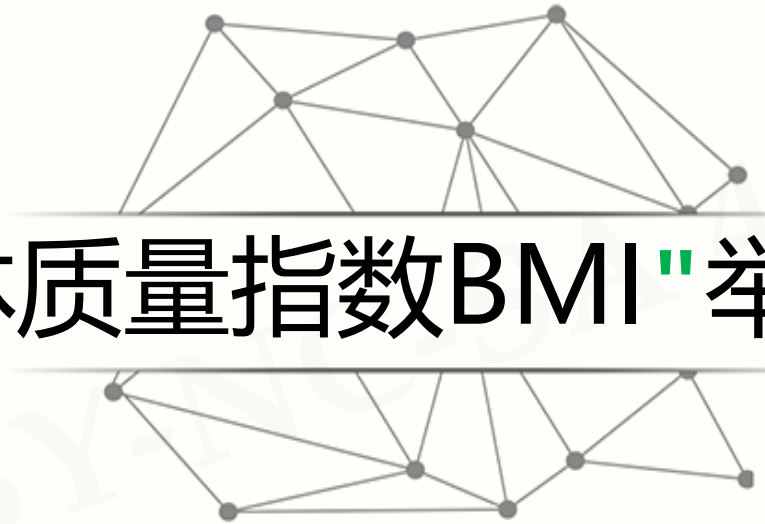
```
#CalBMIv2.py
height, weight = eval(input("请输入身高(米)和体重(公斤)[逗号隔开]: "))
bmi = weight / pow(height, 2)
print("BMI 数值为: {:.2f}".format(bmi))
nat = ""
if bmi < 18.5:
    nat = "偏瘦"
elif 18.5 <= bmi < 24:
    nat = "正常"
elif 24 <= bmi < 28:
    nat = "偏胖"
else:
    nat = "肥胖"
print("BMI 指标为:国内'{0}'".format(nat))
```

分类	国际BMI值	国内BMI值
偏瘦	<18.5	<18.5
正常	18.5 ~ 25	18.5 ~ 24
偏胖	25 ~ 30	24 ~ 28
肥胖	≥30	≥28

```python
#CalBMIv3.py
height, weight = eval(input("请输入身高(米)和体重(公斤)[逗号隔开]: "))
bmi = weight / pow(height, 2)
print("BMI 数值为: {:.2f}".format(bmi))
who, nat = "", ""
if bmi < 18.5:
    who, nat = "偏瘦", "偏瘦"
elif 18.5 <= bmi < 24:
    who, nat = "正常","正常"
elif 24 <= bmi < 25:
    who, nat = "正常","偏胖"
elif 25 <= bmi < 28:
    who, nat = "偏胖","偏胖"
elif 28 <= bmi < 30:
    who, nat = "偏胖","肥胖"
else:
    who, nat = "肥胖","肥胖"
print("BMI 指标为:国际'{0}', 国内'{1}'".format(who, nat))
```

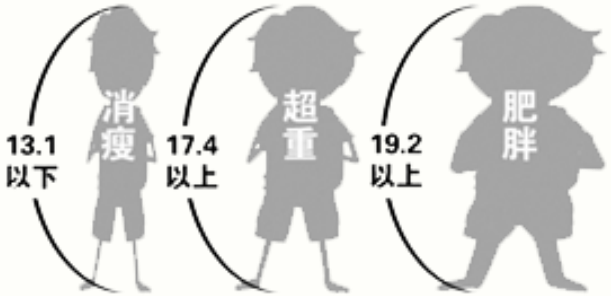
分类	国际BMI值	国内BMI值
偏瘦	<18.5	<18.5
正常	18.5 ~ 25	18.5 ~ 24
偏胖	25 ~ 30	24 ~ 28
肥胖	≥30	≥28

准备好电脑，与老师一起编码吧！



"身体质量指数BMI"举一反三

```
#CalBMIv3.py
height, weight = eval(input("请输入身高(米)和体重(公斤)[逗号隔开]: "))
bmi = weight / pow(height, 2)
print("BMI 数值为: {:.2f}".format(bmi))
who, nat = "", ""
if bmi < 18.5:
    who, nat = "偏瘦", "偏瘦"
elif 18.5 <= bmi < 24:
    who, nat = "正常", "正常"
elif 24 <= bmi < 25:
    who, nat = "正常", "偏胖"
elif 25 <= bmi < 28:
    who, nat = "偏胖", "偏胖"
elif 28 <= bmi < 30:
    who, nat = "偏胖", "肥胖"
else:
    who, nat = "肥胖", "肥胖"
print("BMI 指标为:国际'{0}', 国内'{1}'".format(who, nat))
```



python

举一反三

关注多分支条件的组合

- 多分支条件之间的覆盖是重要问题
- 程序可运行，但如果不正确，要注意多分支
- 分支结构是程序的重要框架，读程序先看分支