

# python

The Python logo, consisting of two interlocking snakes, one blue and one yellow, is positioned below the word "python".

```
import turtle
turtle.setup(650,350,200,200)
turtle.penup()
turtle.fd(-250)
turtle.pendown()
turtle.pensize(25)
turtle.pencolor("purple")

for i in range(4):
    turtle.circle(40, 80)
    turtle.circle(-40, 80)
    turtle.fd(40)
    turtle.circle(16, 180)
    turtle.fd(40 * 2/3)
```

# 实例5: 身体质量指数BMI

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嵩 天  
北京理工大学





# "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 <sup>2</sup> )	国内BMI值 (kg/m <sup>2</sup> )
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

- 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

```
#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"
```

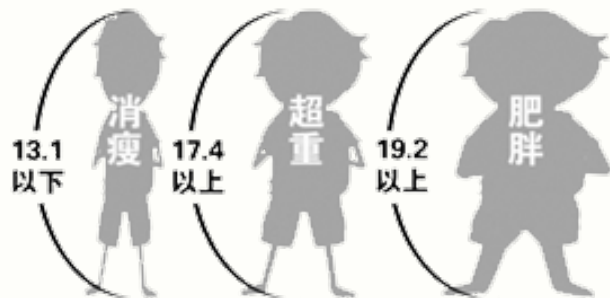
```
elif 28 <= bmi < 30:
```

```
    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))
```



# 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





# 小花絮



【时评】用改革为建设一流鼓足风帆

北京理工大学1940年诞生于延安，是中国共产党创办的第一所理工科大学，是新中国成立以来国家历批次的重点建设高校，首批进入国家“211工程”和“985工程”，首批进入“世界一流大学”建设高校A类行列。毛泽东同志亲自题写校名，学校现隶属于工业和信息化部。



