def hypotenuse(a,b):  
 c\_sqr=a\*\*2+b\*\*2  
 c=c\_sqr\*\*0.5  
 return c  
  
print(hypotenuse(3,4))

Firstly, I make a function outline named hypotenuse

def hypotenuse(a,b):

return 0.0

Obviously, The return value will be 0.0, Let’s test this function, call the function with argument (3,4)

def hypotenuse(a,b):  
 return 0.0  
  
hypotenuse(3,4)

>>> hypotenuse(3.4)

0.0

Reference Pythagorean Theorem, cˆ2=aˆ2+bˆ2. Then we write the statement inside function.

def hypotenuse(a,b):  
 c\_sqr = a\*\*2 + b\*\*2  
 return 0.0  
  
hypotenuse(3,4)

next step, a small trick to avoid using math function. We make c as return value.

c=c\_sqr\*\*0.5 same as c=math.sqrt(c\_sqrt)

def hypotenuse(a,b):  
 c\_sqr = a\*\*2 + b\*\*2  
 c=c\_sqr\*\*0.5  
 return c  
  
hypotenuse(3,4)

complete function is ready to call, lastly, I need a print function execute to get the calling result.

def hypotenuse(a,b):  
 c\_sqr = a\*\*2 + b\*\*2  
 c=c\_sqr\*\*0.5  
 return c  
  
print(hypotenuse(3,4))

5.0

Part2

I intend to write a function to calculate the volume of the shape that user choose.

There will be sphere, cylinder and square box for user to choose

Firstly, I write the sphere volume calculate function.

Volume of sphere is:

*V*=4/3*π3*

def v\_sphere(r):  
 pi=3.14  
 v=4/3\*pi\*r\*\*3  
 return v

Secondly, in cylinder volume calculates formula

*V*=*πr2h*

def v\_cylinder(r,h):  
 pi=3.14  
 v=3.14\*r\*\*2\*h  
 return v

In a similar way, square box volume calculates formula

*V*=*lwh*

def v\_squarebox(l,w,h):  
 v=l\*w\*h  
 return v

three volume calculate functions complete.

Now we start write main part.

print("choose the shape code, to calculate the volume\n 1.sphere 2.cylinder 3.squarebox")  
shape=int(input())

This part is for user choose the shape.

Let’s test.

>>> choose the shape code, to calculate the volume

>>> 1. sphere 2. cylinder 3. Squarebox

>>>1

Program exit.

Then we need an if statement to determine which function we call.

if shape == 1:  
 print("please enter the radius of the sphere")  
 r=int(input())  
 print(int(v\_sphere(r))

In this part, user input 1 choose sphere, then type in radius, calling sphere volume calculate function and print the result.

In similar way.

elif shape == 2:  
 print("please enter the radius(first) and height(second) of the sphere")  
 r=int(input())  
 h=int(input())  
 print(int(v\_cylinder(r,h)))  
elif shape == 3:  
 print("please enter the length(first), width(second) and height(third) of the sphere")  
 l=int(input())  
 w=int(input())  
 h=int(input())  
 print(int(v\_squarebox(l,w,h)))

Lastly, we should formulate a warning information if user type in an invalid shape code.

else:  
 print("wrong code, exit program!")

Full set of the program:

def v\_sphere(r):  
 pi=3.14  
 v=4/3\*pi\*r\*\*3  
 return v  
def v\_cylinder(r,h):  
 pi=3.14  
 v=3.14\*r\*\*2\*h  
 return v  
def v\_squarebox(l,w,h):  
 v=l\*w\*h  
 return v  
  
  
print("choose the shape code, to calculate the volume\n 1.sphere 2.cylinder 3.squarebox")  
shape=int(input())  
if shape == 1:  
 print("please enter the radius of the sphere")  
 r=int(input())  
 print(int(v\_sphere(r)))  
elif shape == 2:  
 print("please enter the radius(first) and height(second) of the sphere")  
 r=int(input())  
 h=int(input())  
 print(int(v\_cylinder(r,h)))  
elif shape == 3:  
 print("please enter the length(first), width(second) and height(third) of the sphere")  
 l=int(input())  
 w=int(input())  
 h=int(input())  
 print(int(v\_squarebox(l,w,h)))  
else:  
 print("wrong code, exit program!")

>>>choose the shape code, to calculate the volume

>>> 1.sphere 2.cylinder 3.squarebox

1

>>> please enter the radius of the sphere

3

>>> 113

>>>choose the shape code, to calculate the volume

>>> 1.sphere 2.cylinder 3.squarebox

2

>>>please enter the radius(first) and height(second) of the sphere

3

4

>>>113

>>>choose the shape code, to calculate the volume

>>> 1.sphere 2.cylinder 3.squarebox

3

>>>please enter the length(first), width(second) and height(third) of the sphere

1

2

3

>>>6

>>>choose the shape code, to calculate the volume

>>> 1.sphere 2.cylinder 3.squarebox

4

>>>wrong code, exit program!