

# CSC1015F Assignment 6A (Lab Question)

## Functions

### Assignment Instructions

THIS QUESTION TO BE COMPLETED DURING YOUR LABORATORY SESSION

This assignment involves constructing Python programs that use input and output statements, 'if' and 'if-else' control flow statements, statements that perform numerical manipulation, and functions.

### Question 1 [30 marks]

The surface area of a cylinder of height  $h$  and base diameter  $d$  is calculated using the following equation:

$$2\pi\left(\frac{d}{2}\right)^2 + \pi dh$$

Write a program called 'cylinder.py' that asks the user to enter the height of a cylinder and the diameter of its base, and that calculates and prints the surface area.

Your program should consist of two functions. One called 'surface\_area', and another called 'main'.

Here is a program skeleton:

```
from math import pi, pow

def surface_area(diameter, height):
    # Your code here

def main():
    # Your code here

if __name__ == '__main__':
    main()
```

The `surface_area` function will accept the diameter and height of a cylinder as parameters and will compute and return the surface area.

The `main` function will ask the user for inputs, will call the `surface_area` function, and will print the result.

Sample I/O:

```
Enter the height of the cylinder:
6.6
Enter the diameter of the base:
6
The surface area is 180.96.
```

(User input is shown in **bold**.)

The value for the surface area should be printed to 2 decimal places.

The program will only compute the area if the values for height and diameter are greater than zero.

Sample I/O:

```
Enter the height of the cylinder:
-2
Enter the diameter of the base:
3
The height and diameter must be greater than zero.
```

(User input is shown in **bold**.)

Sample I/O:

```
Enter the height of the cylinder:
2
Enter the diameter of the base:
0
The height and diameter must be greater than zero.
```

(User input is shown in **bold**.)

## Submission

Create and submit to the automatic marker a Zip file called `ABCXYZ123.zip` (where `ABCXYZ123` is YOUR student number) containing `cylinder.py`.

### NOTES:

1. FOLDERS ARE NOT ALLOWED IN THE ZIP FILE.
2. As you will submit your assignment to the Automarker, the Assignment tab will still say “Not Complete” or “In Progress” or something similar. THIS IS COMPLETELY NORMAL. IGNORE IT.