

Variables

1)

```
amsryan@kali: ~/Desktop/ex/exercise0
$ python
Python 3.11.5 (main, Aug 29 2023, 15:31:31) [GCC 13.2.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> a = 8
>>> b=4
>>> c = a + b
>>> id(c)
10783976
>>> type(c)
<class 'int'>
>>> d = c
>>> c = c/3
>>> id(c)
139731318219792
>>> type(c)
<class 'float'>
>>> id(d)
10783976
>>> type(d)
<class 'int'>
>>> exit()

(amsryan@kali)-[~/Desktop/ex/exercise0]
$
```

2)

```
Terminal
...
#Calculate the average age of students
1student = 20 //years
student2 = 25
student_#3 = 23
x = 19
s-3 = 21
averageStudentAge = (x+s-3((1student+student2)) + student_#3)//5
print(averageStudentAge)
'''

#Calculate the average age of students
student1 = 20 #years
student2 = 25
student3 = 23
student4 = 19
student5 = 21

averagStudentAge = (student1 + student2 + student3 + student4 + student5)/5
print(averagStudentAge)
~
~
~
-- VISUAL --          2          1,4          All

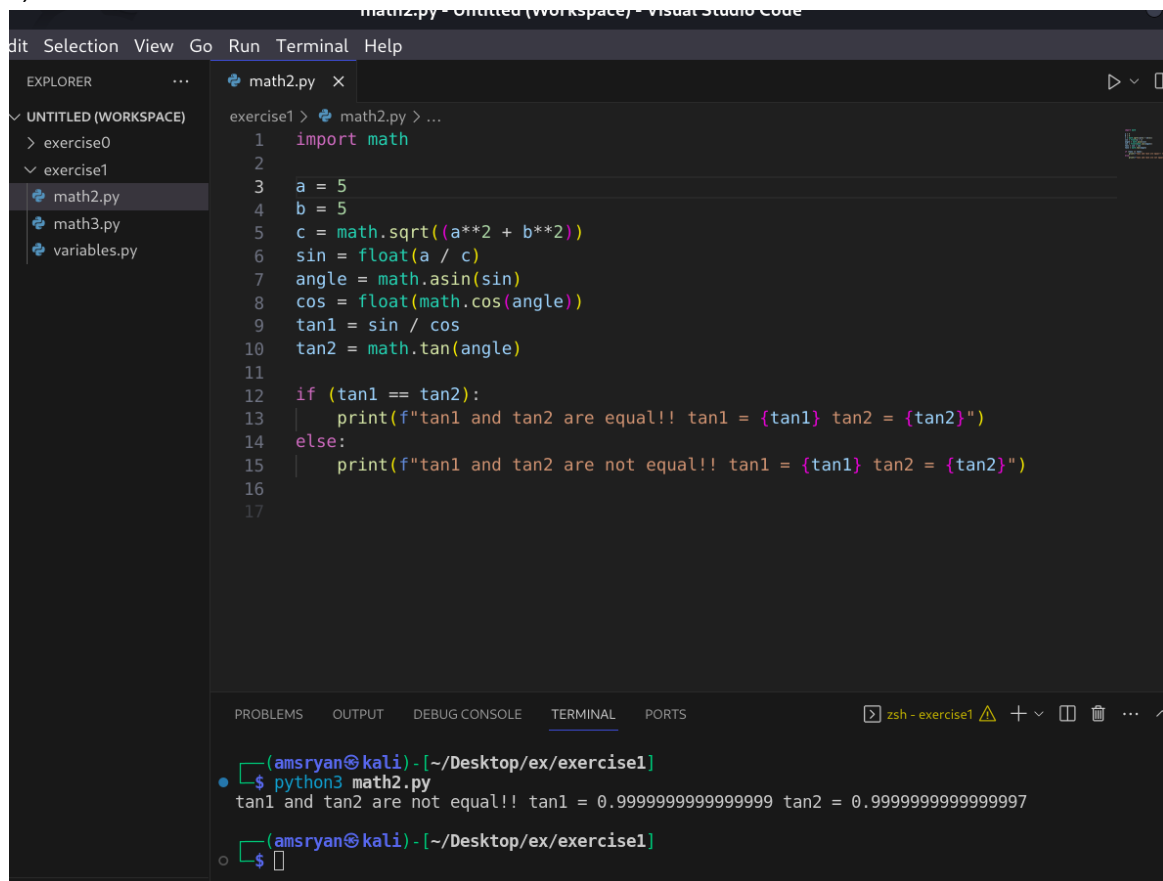
amsryan@kali: ~/Desktop/ex/exercise1
(amsryan@kali)-[~/Desktop/ex/exercise1]
$ python3 variables.py
21.6
(amsryan@kali)-[~/Desktop/ex/exercise1]
$
```

Math

1)

```
amsryan@kali: ~/Desktop
(amsryan@kali)-[~/Desktop]
$ python
Python 3.11.5 (main, Aug 29 2023, 15:31:31) [GCC 13.2.0] on linux
Type "help", "copyright", "credits" or "license" for more information.
>>> x = 0
>>> y = (x**3) - (1.8 * x**2) - (1.2 * x) + 1.6
>>> print(y)
1.6
>>> x = 1.5
>>> y = (x**3) - (1.8 * x**2) - (1.2 * x) + 1.6
>>>
>>> print(y)
-0.8749999999999996
>>> x = 0.5
>>> y = (x**3) - (1.8 * x**2) - (1.2 * x) + 1.6
>>> print(y)
0.675
>>> x = 1
>>> y = (x**3) - (1.8 * x**2) - (1.2 * x) + 1.6
>>> print(y)
-0.3999999999999999
>>> x = 0.8
>>> y = (x**3) - (1.8 * x**2) - (1.2 * x) + 1.6
>>> print(y)
0.0
>>> exit()
(amsryan@kali)-[~/Desktop]
$
```

2)



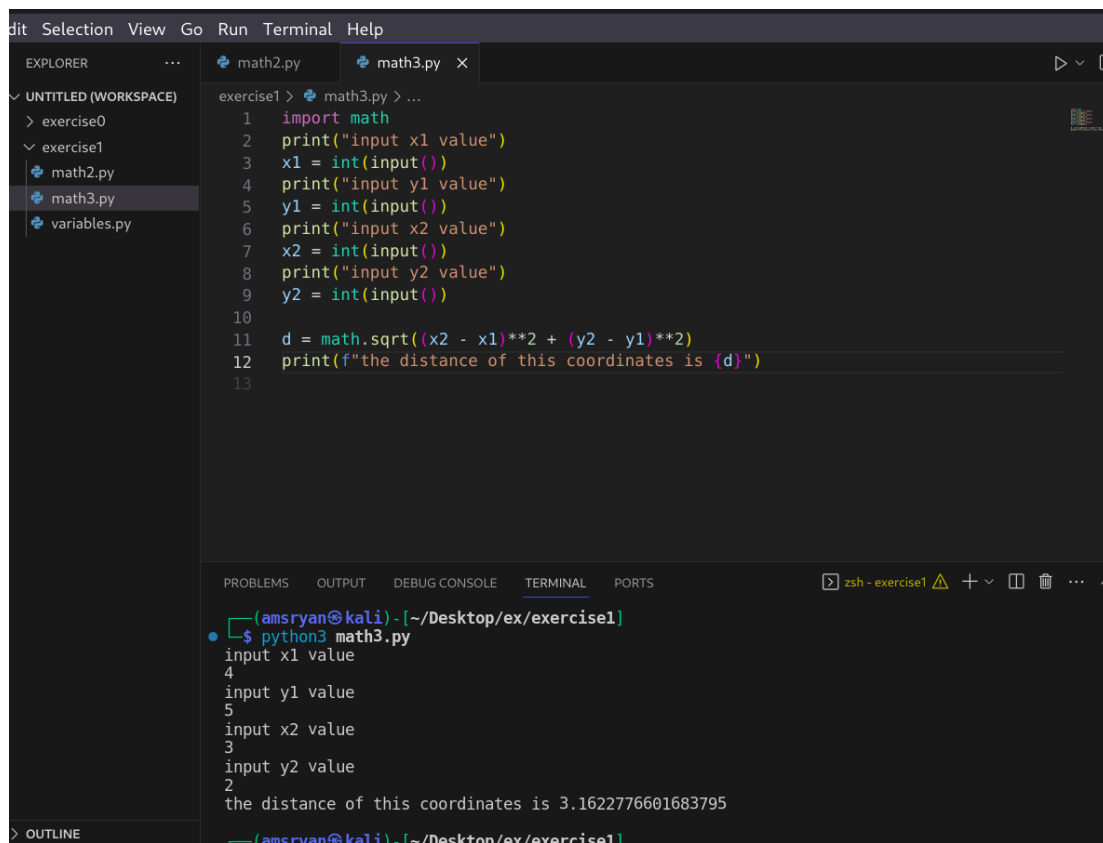
```
math2.py - Untitled (workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help

EXPLORER
  UNTITLED (WORKSPACE)
    exercise0
    exercise1
      math2.py
      math3.py
      variables.py

exercise1 > math2.py > ...
1 import math
2
3 a = 5
4 b = 5
5 c = math.sqrt((a**2 + b**2))
6 sin = float(a / c)
7 angle = math.asin(sin)
8 cos = float(math.cos(angle))
9 tan1 = sin / cos
10 tan2 = math.tan(angle)
11
12 if (tan1 == tan2):
13     print(f"tan1 and tan2 are equal!! tan1 = {tan1} tan2 = {tan2}")
14 else:
15     print(f"tan1 and tan2 are not equal!! tan1 = {tan1} tan2 = {tan2}")
16
17

TERMINAL
  (amsryan@kali) - [~/Desktop/ex/exercise1]
  $ python3 math2.py
  tan1 and tan2 are not equal!! tan1 = 0.9999999999999999 tan2 = 0.9999999999999997
  (amsryan@kali) - [~/Desktop/ex/exercise1]
  $
```

3)



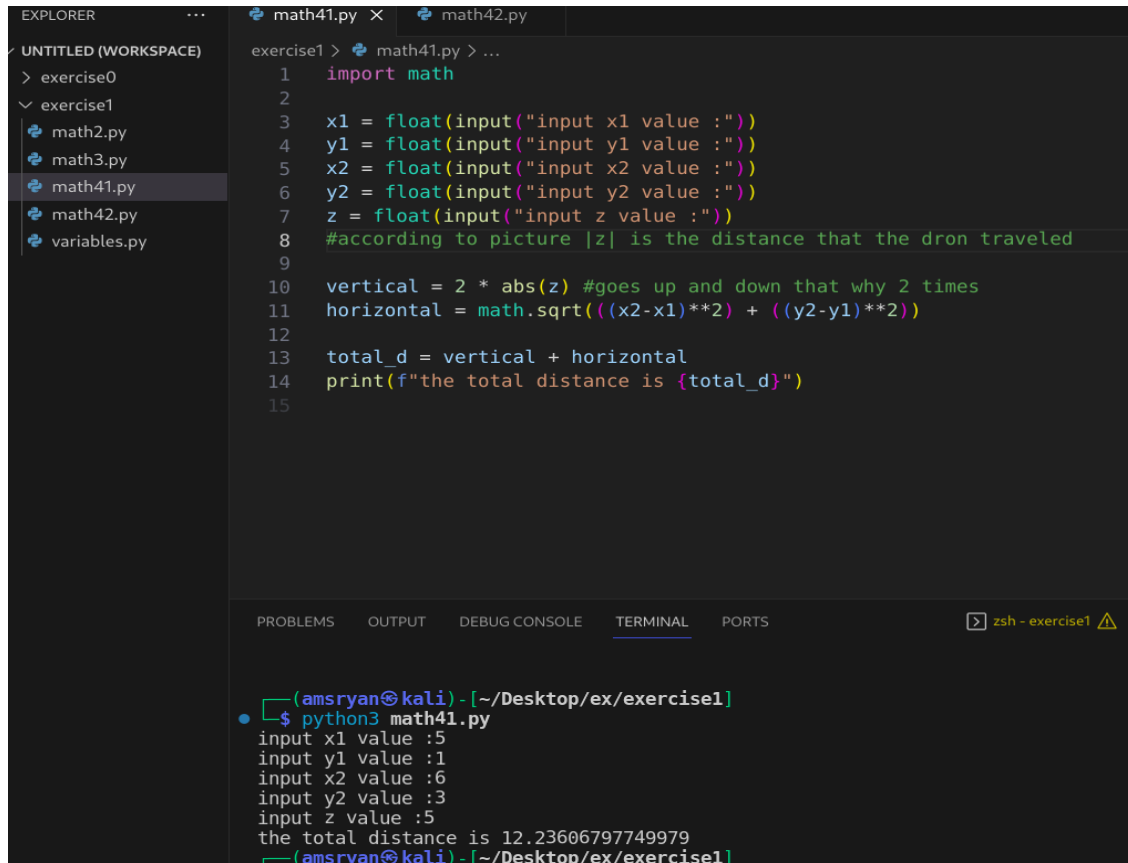
```
math2.py math3.py - Untitled (workspace) - Visual Studio Code
File Edit Selection View Go Run Terminal Help

EXPLORER
  UNTITLED (WORKSPACE)
    exercise0
    exercise1
      math2.py
      math3.py
      variables.py

exercise1 > math3.py > ...
1 import math
2 print("input x1 value")
3 x1 = int(input())
4 print("input y1 value")
5 y1 = int(input())
6 print("input x2 value")
7 x2 = int(input())
8 print("input y2 value")
9 y2 = int(input())
10
11 d = math.sqrt((x2 - x1)**2 + (y2 - y1)**2)
12 print(f"the distance of this coordinates is {d}")
13

TERMINAL
  (amsryan@kali) - [~/Desktop/ex/exercise1]
  $ python3 math3.py
  input x1 value
  4
  input y1 value
  5
  input x2 value
  3
  input y2 value
  2
  the distance of this coordinates is 3.1622776601683795
  (amsryan@kali) - [~/Desktop/ex/exercise1]
  $
```

4.1)



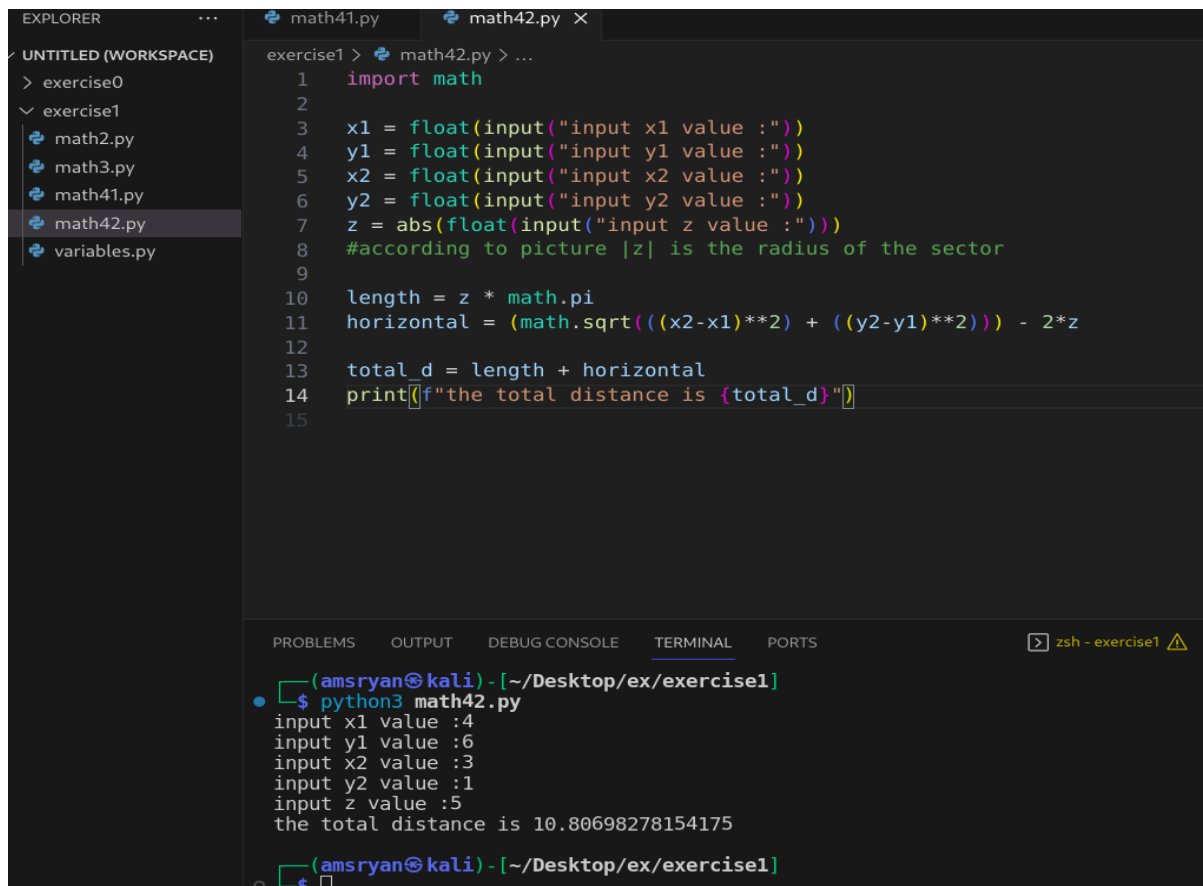
```
EXPLORER  ...
UNTITLED (WORKSPACE)
> exercise0
  exercise1
    math2.py
    math3.py
    math41.py
    math42.py
    variables.py

exercise1 > math41.py > ...
1  import math
2
3  x1 = float(input("input x1 value :"))
4  y1 = float(input("input y1 value :"))
5  x2 = float(input("input x2 value :"))
6  y2 = float(input("input y2 value :"))
7  z = float(input("input z value :"))
8  #according to picture |z| is the distance that the drone traveled
9
10 vertical = 2 * abs(z) #goes up and down that why 2 times
11 horizontal = math.sqrt(((x2-x1)**2) + ((y2-y1)**2))
12
13 total_d = vertical + horizontal
14 print(f"the total distance is {total_d}")
15

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
zsh - exercise1

(amsryan@kali) - [~/Desktop/ex/exercise1]
$ python3 math41.py
input x1 value :5
input y1 value :1
input x2 value :6
input y2 value :3
input z value :5
the total distance is 12.23606797749979
(amsryan@kali) - [~/Desktop/ex/exercise1]
```

4.2)



```
EXPLORER  ...
UNTITLED (WORKSPACE)
> exercise0
  exercise1
    math2.py
    math3.py
    math41.py
    math42.py
    variables.py

exercise1 > math42.py > ...
1  import math
2
3  x1 = float(input("input x1 value :"))
4  y1 = float(input("input y1 value :"))
5  x2 = float(input("input x2 value :"))
6  y2 = float(input("input y2 value :"))
7  z = abs(float(input("input z value :")))
8  #according to picture |z| is the radius of the sector
9
10 length = z * math.pi
11 horizontal = (math.sqrt(((x2-x1)**2) + ((y2-y1)**2))) - 2*z
12
13 total_d = length + horizontal
14 print(f"the total distance is {total_d}")
15

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
zsh - exercise1

(amsryan@kali) - [~/Desktop/ex/exercise1]
$ python3 math42.py
input x1 value :4
input y1 value :6
input x2 value :3
input y2 value :1
input z value :5
the total distance is 10.80698278154175
(amsryan@kali) - [~/Desktop/ex/exercise1]
$
```