Assignment 1

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Hierarchical Index

1.1 Class Hierarchy

This inheritance list is sorted roughly, but not completely, alphabetically:

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Class Index

2.1 Class List

Here are the classes, structs, unions and interfaces with brief descriptions:

Chapter 3

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3.1 File List

Here is a list of all documented files with brief descriptions:

Chapter 4

Class Documentation

4.1 complex_adt.ComplexT Class Reference

Public Member Functions

- def __init__
  ComplexT constructor.

Public Attributes

- **x**
- **y**

4.1.1 Constructor & Destructor Documentation

4.1.1.1 __init__()

```
def complex_adt.ComplexT.__init__ (
              self,
              x )
```

ComplexT constructor.

Initializes a ComplexT object with real part and an imaginary part. It also rounds the value of both real and imaginary parts upto five decimal points. Assumption is made that the both inputs are of floating point type.

Parameters

x	The real part of the ComplexT object.
y	The imaginary part of the ComplexT object.

The documentation for this class was generated from the following file:

- src/complex_adt.py

4.2 triangle_adt.TriangleT Class Reference

Public Member Functions

- def __init__
  TriangleT constructor.
- def get_sides (self)
  Gets all the lenght of sides of a triangle.
- def equal (self, t)
  Checks if two TriangleT objects are equal or not.
- def perim (self)
  Calculates the perimeter of a TriangleT object by adding all the lenghts of sides.
- def area (self)
  Calculates the area of a TriangleT object by using herons formula.
- def is_valid (self)
  Checks if TriangleT object is valid.
- def tri_type (self)
  Checks what type of Triangle the TriangleT object is.

Public Attributes

- **s**

4.2.1 Constructor & Destructor Documentation

4.2.1.1 __init__()

```
def triangle_adt.TriangleT.__init__ (
            self,
            a )
```

TriangleT constructor.

Initializes a TriangleT object by taking three sides as input. Assumption is made that all the inputs are of integer types.

Parameters

a	The length of first side of triangle.
b	The length of second side of triangle.
c	The length of third side of triangle.

4.2.2 Member Function Documentation

4.2.2.1 area()

```
def triangle_adt.TriangleT.area (
              self )
```

Calculates the area of a TriangleT object by using herons formula.

Exceptions

TriangleNotValid	Throws TriangleNotValid if TriangleT object is not valid.

Returns

Area of TriangleT object.

4.2.2.2 equal()

```
def triangle_adt.TriangleT.equal (
              self,
              t )
```

Checks if two TriangleT objects are equal or not.

param t TriangleT object evaluated for equality.

Exceptions

TriangleNotValid	Throws TriangleNotValid if TriangleT object is not valid.

Returns

Returns true if the TriangleT object is equal with the given TriangleT object; false if not

4.2.2.3 get_sides()

```
def triangle_adt.TriangleT.get_sides (
              self )
```

Gets all the lenght of sides of a triangle.

Returns

A tuple of lengths of sides in a sorted order.

4.2.2.4 is_valid()

```
def triangle_adt.TriangleT.is_valid (
              self )
```

Checks if TriangleT object is valid.

Checks validity of TriangleT by checking if the sum of any two sides would be less or equal to the third side.

Returns

Returns true if the TriangleT object is valid; false if not.

4.2.2.5 perim()

```
def triangle_adt.TriangleT.perim (
              self )
```

Calculates the perimeter of a TriangleT object by adding all the lenghts of sides.

Exceptions

TriangleNotValid	Throws TriangleNotValid if TriangleT object is not valid.

Returns

Sum of all lengths of sides.

4.2.2.6 tri_type()

```
def triangle_adt.TriangleT.tri_type (
              self )
```

Checks what type of Triangle the TriangleT object is.

Exceptions

TriangleNotValid	Throws TriangleNotValid if TriangleT object is not valid.

The triangle type is checked by applying different formulas for which Right,Scalene,Isosceles and Equilateral will hold true. Right Angle Triangle type objects have the highest precedency.

Returns

The type of TriangleT object.

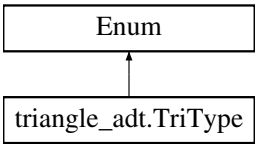
The documentation for this class was generated from the following file:

- src/triangle_adt.py

4.3 triangle_adt.TriType Class Reference

An enumerated data type that represents different types of triangles.

Inheritance diagram for triangle_adt.TriType:



Static Public Attributes

- int **equilat** = 1
- int **isosceles** = 2
- int **scalene** = 3
- int **right** = 4

4.3.1 Detailed Description

An enumerated data type that represents different types of triangles.

The documentation for this class was generated from the following file:

- src/triangle_adt.py

Chapter 5

File Documentation

5.1 src/complex_adt.py File Reference

Provides methods for performing calculations on complex numbers.

Classes

- class complex_adt.ComplexT

Functions

- def complex_adt.real (self)

  Gets the real part of the ComplexT object.
- def complex_adt.imag (self)

  imag Gets the imaginary part of the ComplexT object.
- def complex_adt.get_r (self)

  get_r Calculates the modulus of the ComplexT object.
- def complex_adt.get_phi (self)

  Calculates the phase(argument) between the ComplexT object.
- def complex_adt.equal (self, c)

  Check if the two complex numbers are equal or not.
- def complex_adt.conj (self)

  Does the negation of the imaginary part.
- def complex_adt.add (self, a)

  Adds the two ComplexT objects.
- def complex_adt.sub (self, a)

  Subtracts the two ComplexT objects.
- def complex_adt.mult (self, a)

  Multiplies two ComplexT objects.
- def complex_adt.recip (self)

  Divides one by the ComplexT object.
- def complex_adt.div (self, a)

  Divides the two ComplexT objects.
- def complex_adt.sqrt (self)

  Finds the square root of the ComplexT object.

5.1.1 Detailed Description

Provides methods for performing calculations on complex numbers.

Author

Harkanwar Singh Waraich

Date

01/14/2021

5.1.2 Function Documentation

5.1.2.1 add()

```
def complex_adt.add (
              self,
              a )
```

Adds the two ComplexT objects.

Parameters

a	ComplexT object to be added.

Returns

Addition of two ComplexT objects.

5.1.2.2 conj()

```
def complex_adt.conj (
              self )
```

Does the negation of the imaginary part.

Returns

The same object but with the negation of the imaginary part

5.1.2.3 div()

```
def complex_adt.div (
              self,
              a )
```

Divides the two ComplexT objects.

Exceptions

ZeroDivisionError	Throws ZeroDivisionError if in a ComplexT object both imaginary and real parts are equal to zero it is not possible to do a division of it with ComplexT object> .

This function uses complex() python function which takes real and imaginary parts of ComplexT object. After the argument is divided by class variable we can retrieve imaginary and real parts complex number which can be passed to ComplexT object.

Parameters

a	ComplexT object by which the the division will occur.

Returns

ComplecT object after the division.

5.1.2.4 equal()

```
def complex_adt.equal (
              self,
              c )
```

Check if the two complex numbers are equal or not.

Parameters

c	ComplexT object to be evaluated for equality.

Returns

Returns true if the ComplexT object is equal with the given ComplexT object; false if not

5.1.2.5 get_phi()

```
def complex_adt.get_phi (
              self )
```

Calculates the phase(argument) between the ComplexT object.

Returns

The phase(argument) in radians using phase function from cmath library

5.1.2.6 get_r()

```
def complex_adt.get_r (
              self )
```

get_r Calculates the modulus of the ComplexT object.

Returns

The modulus of the the ComplexT object.

5.1.2.7 imag()

```
def complex_adt.imag (
              self )
```

imag Gets the imaginary part of the ComplexT object.

Returns

The imaginary part of the ComplexT object.

5.1.2.8 mult()

```
def complex_adt.mult (
              self,
              a )
```

Multiplies two ComplexT objects.

This function uses complex() python function which takes real and imaginary parts of ComplexT object and the input. It then multiplies and from its result we can retrieve imaginary and real parts complex number which can be passed to ComplexT object.

Parameters

a	ComplexT object to be Multiplied

Returns

A ComplexT object after two ComplexT objects are multiplied.

5.1.2.9 real()

```
def complex_adt.real (
              self )
```

Gets the real part of the ComplexT object.

Returns

The real part of the ComplexT object.

5.1.2.10 recip()

```
def complex_adt.recip (
              self )
```

Divides one by the ComplexT object.

Exceptions

ZeroDivisionError	Throws ZeroDivisionError if in a ComplexT object both imaginary and real parts are equal to zero it is not possible to do a reciprocal of it.

This function uses complex() python function which takes real and imaginary parts of ComplexT object. After the one is divided by class variable we can retrieve imaginary and real parts complex number which can be passed to ComplexT object.

Returns

Resiprocal of the ComplexT object.

5.1.2.11 sqrt()

```
def complex_adt.sqrt (
              self )
```

Finds the square root of the ComplexT object.

This function uses complex() python function which takes real and imaginary parts of ComplexT object. After the square root of complex number we can retrieve imaginary and real parts complex number which can be passed to ComplexT object.

Returns

Square root of the ComplexT object.

5.1.2.12 sub()

```
def complex_adt.sub (
              self,
              a )
```

Subtracts the two ComplexT objects.

Parameters

a	ComplexT object to be subtracted.

Returns

A ComplexT object after two ComplexT objects are subtracted.

5.2 src/triangle_adt.py File Reference

Provides methods for performing calculations on complex numbers.

Classes

- class triangle_adt.TriType

  An enumerated data type that represents different types of triangles.
- class triangle_adt.TriangleT

5.2.1 Detailed Description

Provides methods for performing calculations on complex numbers.

Author

Harkanwar Singh Waraich

Date

01/16/2021

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