

## Assignment 1

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# Chapter 1

## Class Index

### 1.1 Class List

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

<a href="#">date_adt.DateT</a>		
An ADT for the class <a href="#">DateT</a>	.....	<a href="#">5</a>
<a href="#">pos_adt.GPosT</a>		
An ADT for the class <a href="#">GPosT</a>	.....	<a href="#">10</a>



## Chapter 2

# File Index

### 2.1 File List

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

src/ <a href="#">date_adt.py</a>	This module creates date related calculations using several methods. This includes getting the next and previous day and calculation differences between two given days . . . . .	15
src/ <a href="#">pos_adt.py</a>	A Global position module that implements many functions . . . . .	15





## Chapter 3

# Class Documentation

### 3.1 `date_adt.DateT` Class Reference

An ADT for the class `DateT`.

#### Public Member Functions

- `def __init__ (self, d, m, y)`  
*A constructor for the `DateT` class.*
- `def day (self)`  
*A getter method for the day number.*
- `def month (self)`  
*A getter method for the month number.*
- `def year (self)`  
*A getter method for the year number.*
- `def next (self)`  
*A method to provide the next day.*
- `def prev (self)`  
*A method to provide the previous day.*
- `def before (self, d)`  
*A method to provide whether the day provided is before the current day.*
- `def after (self, d)`  
*A method to provide whether the day provided is after the current day.*
- `def equal (self, d)`  
*A method to provide whether the day provided is equal to the current day.*
- `def add_days (self, n)`  
*Adds a specific number of days to a `DateT` objects.*
- `def days_between (self, d)`  
*Calculates the difference in days between two dates.*

#### Public Attributes

- `d`
- `m`
- `y`

### 3.1.1 Detailed Description

An ADT for the class [DateT](#).

Some assumptions made include that the user will be inputting correct dates in order for the module to return some correct dates.

### 3.1.2 Constructor & Destructor Documentation

#### 3.1.2.1 `__init__()`

```
def date_adt.DateT.__init__ (
    self,
    d,
    m,
    y )
```

A constructor for the [DateT](#) class.

Initializes the attributes of the [DateT](#) objects

##### Parameters

<i>d</i>	represents the day number eg: 0-31
<i>m</i>	represents the month number eg: 1-12
<i>y</i>	represents the yea number eg: 2020

### 3.1.3 Member Function Documentation

#### 3.1.3.1 `add_days()`

```
def date_adt.DateT.add_days (
    self,
    n )
```

Adds a specific number of days to a [DateT](#) objects.

##### Parameters

<i>n</i>	represents the number of days to be added
----------	---

**Returns**

The date after n days have been added to the [DateT](#) object

**3.1.3.2 after()**

```
def date_adt.DateT.after (
    self,
    d )
```

A method to provide whether the day provided is after the current day.

**Parameters**

<i>d</i>	represents the day to be compared
----------	-----------------------------------

**Returns**

True if the day is after the current day, false if the day is not after the current day

**3.1.3.3 before()**

```
def date_adt.DateT.before (
    self,
    d )
```

A method to provide whether the day provided is before the current day.

**Parameters**

<i>d</i>	represents the day to be compared
----------	-----------------------------------

**Returns**

True if the day is before the current day, false if the day is not before the current day

**3.1.3.4 day()**

```
def date_adt.DateT.day (
    self )
```

A getter method for the day number.

**Returns**

The day number

**3.1.3.5 days\_between()**

```
def date_adt.DateT.days_between (
    self,
    d )
```

Calculates the difference in days between two dates.

**Parameters**

<i>d</i>	represents a date
----------	-------------------

**Returns**

The difference between the date object and *d* in days

**3.1.3.6 equal()**

```
def date_adt.DateT.equal (
    self,
    d )
```

A method to provide whether the day provided is equal to the current day.

**Parameters**

<i>d</i>	represents the day to be compared
----------	-----------------------------------

**Returns**

True if the day is equal to the current day, false if the day is not equal to the current day

**3.1.3.7 month()**

```
def date_adt.DateT.month (
    self )
```

A getter method for the month number.

**Returns**

The month number

**3.1.3.8 next()**

```
def date_adt.DateT.next (
    self )
```

A method to provide the next day.

**Returns**

The day after the current object

**3.1.3.9 prev()**

```
def date_adt.DateT.prev (
    self )
```

A method to provide the previous day.

**Returns**

The day before the current object

**3.1.3.10 year()**

```
def date_adt.DateT.year (
    self )
```

A getter method for the year number.

**Returns**

The year

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

- [src/date\\_adt.py](#)

## 3.2 pos\_adt.GPosT Class Reference

An ADT for the class [GPosT](#).

### Public Member Functions

- `def __init__ (self, phi, lam)`  
*A constructor for the [GPosT](#) class.*
- `def latitude (self)`  
*A getter method for the latitude.*
- `def longitude (self)`  
*A getter method for the longitude.*
- `def west_of (self, p)`  
*Compares if a position is west of the current position.*
- `def north_of (self, p)`  
*Compares if a position is north of the current position.*
- `def equal (self, p)`  
*Checks if two positions are equal.*
- `def move (self, b, d)`  
*Moves the current [GPosT](#) object to a new position.*
- `def distance (self, p)`  
*Calculates distance between the current object and point p.*
- `def arrival_date (self, p, d, s)`  
*Calculates the date of arrival for someone starting at the current position on date d and moving to position p at speed s.*

### Public Attributes

- `phi`
- `lam`

### 3.2.1 Detailed Description

An ADT for the class [GPosT](#).

Some assumptions made include that the latitude or longitude is between -90 and 90 degrees.

### 3.2.2 Constructor & Destructor Documentation

#### 3.2.2.1 \_\_init\_\_()

```
def pos_adt.GPosT.__init__ (  
    self,  
    phi,  
    lam )
```

A constructor for the [GPosT](#) class.

Initializes the attributes of the [GPosT](#) objects.

## Parameters

<i>phi</i>	represents the latitude
<i>lam</i>	represents the longitude

### 3.2.3 Member Function Documentation

#### 3.2.3.1 arrival\_date()

```
def pos_adt.GPosT.arrival_date (
    self,
    p,
    d,
    s )
```

Calculates the date of arrival for someone starting at the current position on date d and moving to position p at speed s.

## Parameters

<i>p</i>	represents the end position
<i>d</i>	represents the date the travel starts
<i>s</i>	represents the speed of travel

## Returns

The date of arrival (a DateT object)

#### 3.2.3.2 distance()

```
def pos_adt.GPosT.distance (
    self,
    p )
```

Calculates distance between the current object and point p.

## Parameters

<i>p</i>	represents the point to calculate the distance to
----------	---

## Returns

The distance between the two positions

### 3.2.3.3 equal()

```
def pos_adt.GPost.equal (
    self,
    p )
```

Checks if two positions are equal.

#### Parameters

<i>p</i>	represents position to be compared to
----------	---------------------------------------

#### Returns

True if they are equal (or within 1 km away from each other), False if they are not equal

### 3.2.3.4 latitude()

```
def pos_adt.GPost.latitude (
    self )
```

A getter method for the latitude.

#### Returns

The latitude

### 3.2.3.5 longitude()

```
def pos_adt.GPost.longitude (
    self )
```

A getter method for the longitude.

#### Returns

The longitude

### 3.2.3.6 move()

```
def pos_adt.GPost.move (
    self,
    b,
    d )
```

Moves the current [GPost](#) object to a new position.



## Parameters

<i>b</i>	represents bearing to be moved towards
<i>d</i>	represents distance to be moved

## 3.2.3.7 north\_of()

```
def pos_adt.GPosT.north_of (
    self,
    p )
```

Compares if a position is north of the current position.

## Parameters

<i>p</i>	represents position to be compared to
----------	---------------------------------------

## Returns

True if it is north of, False is not north of

## 3.2.3.8 west\_of()

```
def pos_adt.GPosT.west_of (
    self,
    p )
```

Compares if a position is west of the current position.

## Parameters

<i>p</i>	represents position to be compared to
----------	---------------------------------------

## Returns

True if it is west of, False if not west of

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

- [src/pos\\_adt.py](#)



## Chapter 4

# File Documentation

### 4.1 src/date\_adt.py File Reference

This module creates date related calculations using several methods. This includes getting the next and previous day and calculation differences between two given days.

#### Classes

- class `date_adt.DateT`  
*An ADT for the class `DateT`.*

#### 4.1.1 Detailed Description

This module creates date related calculations using several methods. This includes getting the next and previous day and calculation differences between two given days.

#### Author

Yousam Asham

#### Date

09-01-2020

### 4.2 src/pos\_adt.py File Reference

A Global position module that implements many functions.

#### Classes

- class `pos_adt.GPosT`  
*An ADT for the class `GPosT`.*

## Variables

- int **pos\_adt.earthRadius** = 6371

### 4.2.1 Detailed Description

A Global position module that implements many functions.

#### Author

Yousam Asham

#### Date

11-01-2020

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