Trees

March 3, 2022

1 Trees in Python

Establishing the values of variables.

[41]:
```
vars = {
        'x': 4,
        'y': 7
}
```

1.1 Class Declarations

1.1.1 Base Class Declarations

Creating the base class for expressions.

[42]:
```
class Exprs():
        pass
```

Defining the base class for Operators such as + and *.

[43]:
```
class Operators(Exprs):
        def __init__(self, l, r):
                self.l = l
                self.r = r

        def __str__(self):
                return f'({self.l} {self.symb} {self.r})'
```

1.1.2 Specific Operator Declarations

[44]:
```
class Minus(Operators):
        def __init__(self, l, r):
                super().__init__(l, r)
                self.symb = '-'
```

[45]:
```
class Plus(Operators):
        def __init__(self, l, r):
                super().__init__(l, r)
```

```
                self.symb = '+'
```

[46]:
```
class Times(Operators):
        def __init__(self, l, r):
                super().__init__(l, r)
                self.symb = '*'
```

[47]:
```
class Divide(Operators):
        def __init__(self, l, r):
                super().__init__(l, r)
                self.symb = '/'
```

1.1.3 Other Class Declarations

[48]:
```
class Const(Exprs):
        def __init__(self, value):
                self.value = value

        def __str__(self):
                return str(self.value)
```

[49]:
```
class Var(Exprs):
        def __init__(self, name):
                self.name = name

        def __str__(self):
                return str(self.name)
```

1.2 Object Creation

Creates the equation: $5 * (4 + x)$

[50]:
```
e1 = Times(Const(5), Plus(Const(4), Var('x')))
```

[51]:
```
print(e1)
```

```
(5 * (4 + x))
```

Creates the equation: $\frac{9+y}{8-x}$

[52]:
```
e2 = Divide(Plus(Const(9), Var('y')), Minus(Const(8), Var('x')))
```

[53]:
```
print(e2)
```

```
((9 + y) / (8 - x))
```