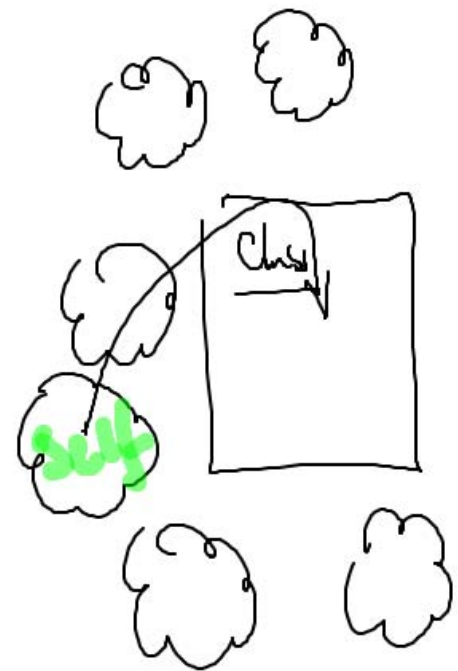
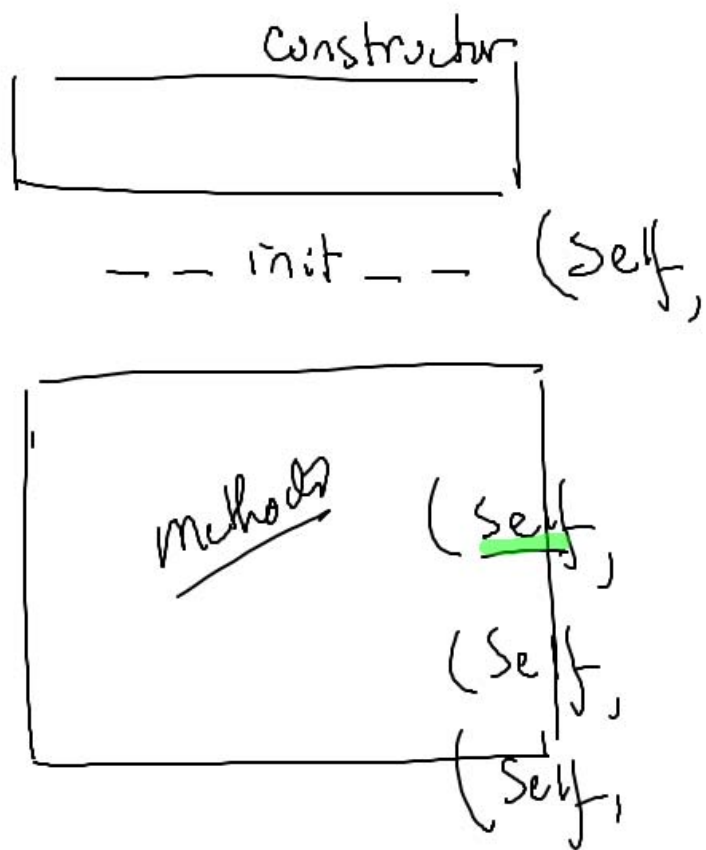


EM&CP Blk Thursday, April 7, 2022

Class



Card (deck of cards)

Ordinary deck of 52 playing cards

Suits → 1 Heart, 2 Spades, 3 Clubs, 4 Diamonds ✓

Rank — Ace, 2, 3, ..., 9, 10, Jack, Queen, King

↑ ↑ ↑ ↑ ↑ ↑ ↑ ✓
1 2 3 10 11 12 13 ✓

class Card:

input: Suit #, Rank #

getSuit getRank

```
class Card:
    def __init__(self, suit, rank):
        self.suit = suit
        self.rank = rank
    def printCard(self):
        print(self.suit, self.rank)
    def getCard(self):
        return (self.suit, self.rank)
```

print out card

eg ace of clubs

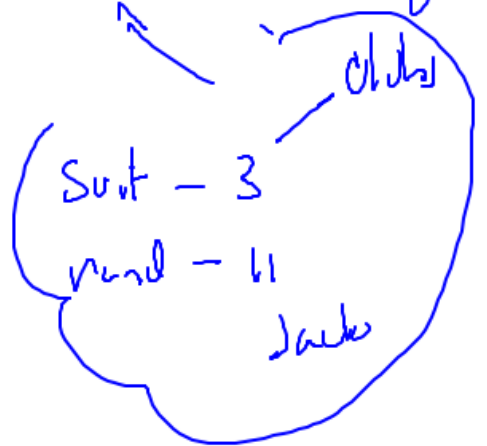


3 of diamond Jack of Clubs
three

def getCard

(suit, rank)

(3, 11)



Suits → ^① hearts, ^② spades, ^③ clubs, ^④ diamonds

```
def printCard(self):
```

prints out, for example

⇒ ace of ³ clubs, three of diamonds

```
def getCard(self)
```

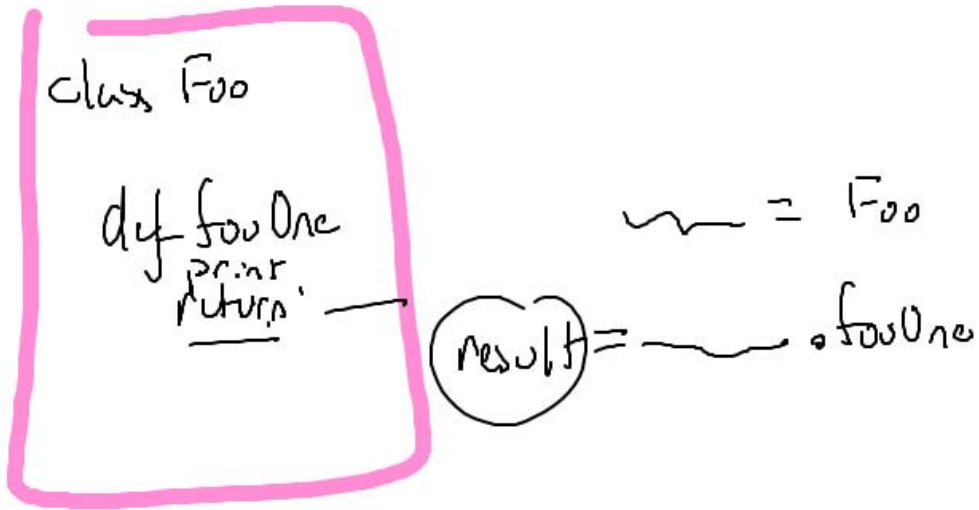
prints out (3, 1)

→ suits = [_____]
→ ranks = [_____]

suits = [_____]
ranks = [_____]

to change how Python prints your instance:

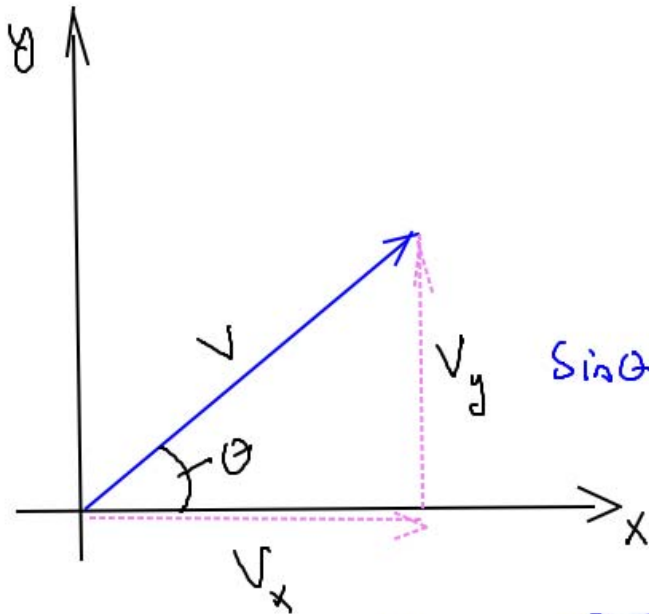
```
def __str__(self):  
    return String
```



None

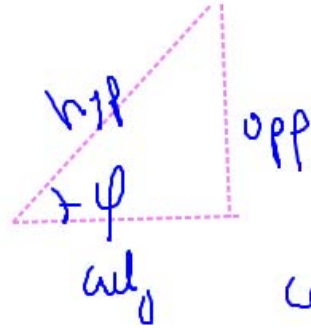
type; nonetype

Vectors — magnitude
+
direction



$$\sin \theta = \frac{V_y}{V}$$

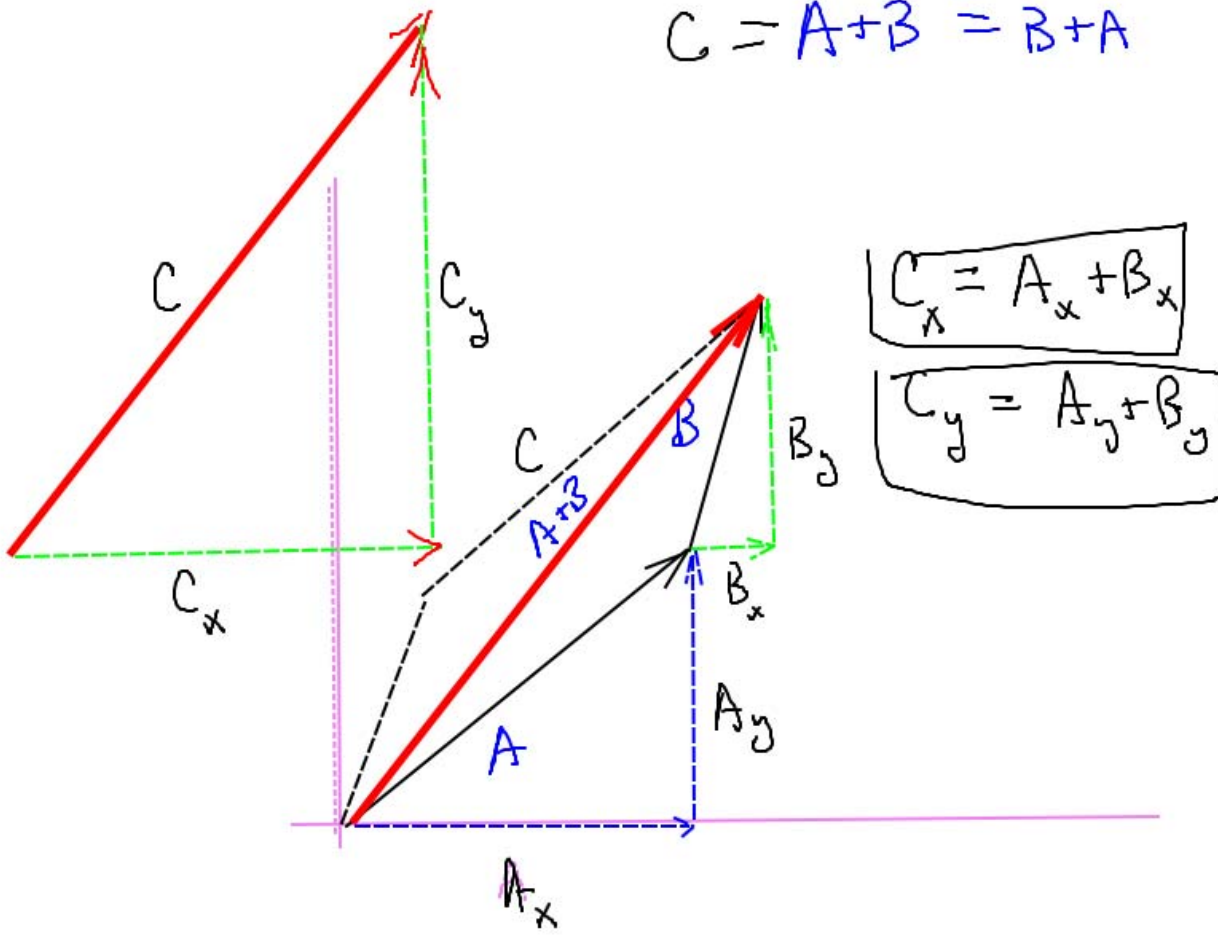
$$\cos \theta = \frac{V_x}{V} \Rightarrow V_x = V \cos \theta$$



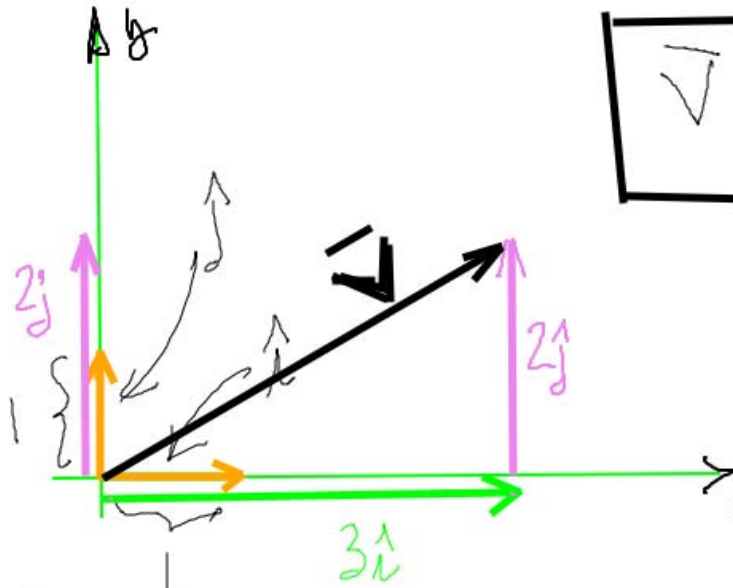
$$\cos \phi = \frac{\text{adj}}{\text{hyp}}$$
$$\sin \phi = \frac{\text{opp}}{\text{hyp}}$$

$$V_y = V \sin \theta$$

$$C = A + B = B + A$$



Unit vectors — magnitude is 1 (unity)
 — "point" in the axis direction



$$\vec{V} = 3\hat{i} + 2\hat{j}$$

$$\vec{A} = 3\hat{i} + 7\hat{j}, \vec{B} = -1\hat{i} + 2\hat{j}$$

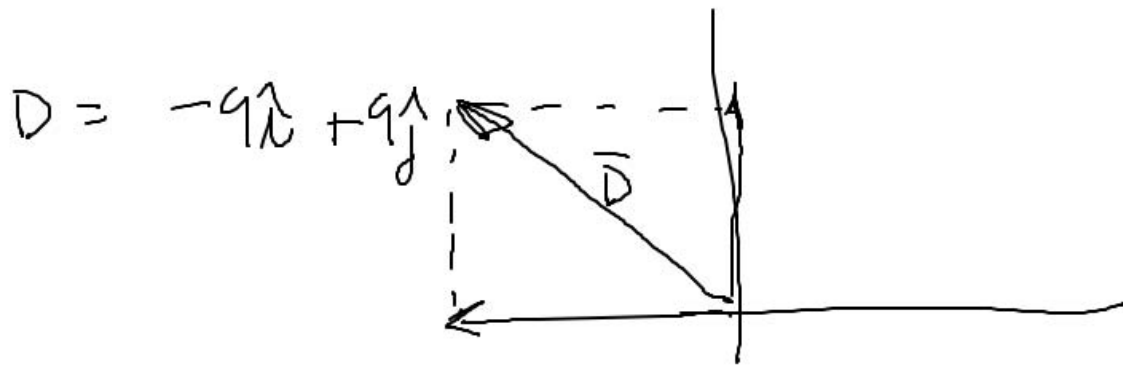
$$\vec{A} + \vec{B} = 2\hat{i} - 5\hat{j} = \vec{C}$$

$$\vec{A} + \vec{B} = (3 + (-1))\hat{i} + (-7 + 2)\hat{j}$$

$$B = (-7\hat{i} - \hat{j})$$

$$C = (-2\hat{i} + 10\hat{j})$$

$$\bar{D} = \bar{B} + \bar{C} = (-7 + (-2))\hat{i} + (-1 + 10)\hat{j}$$

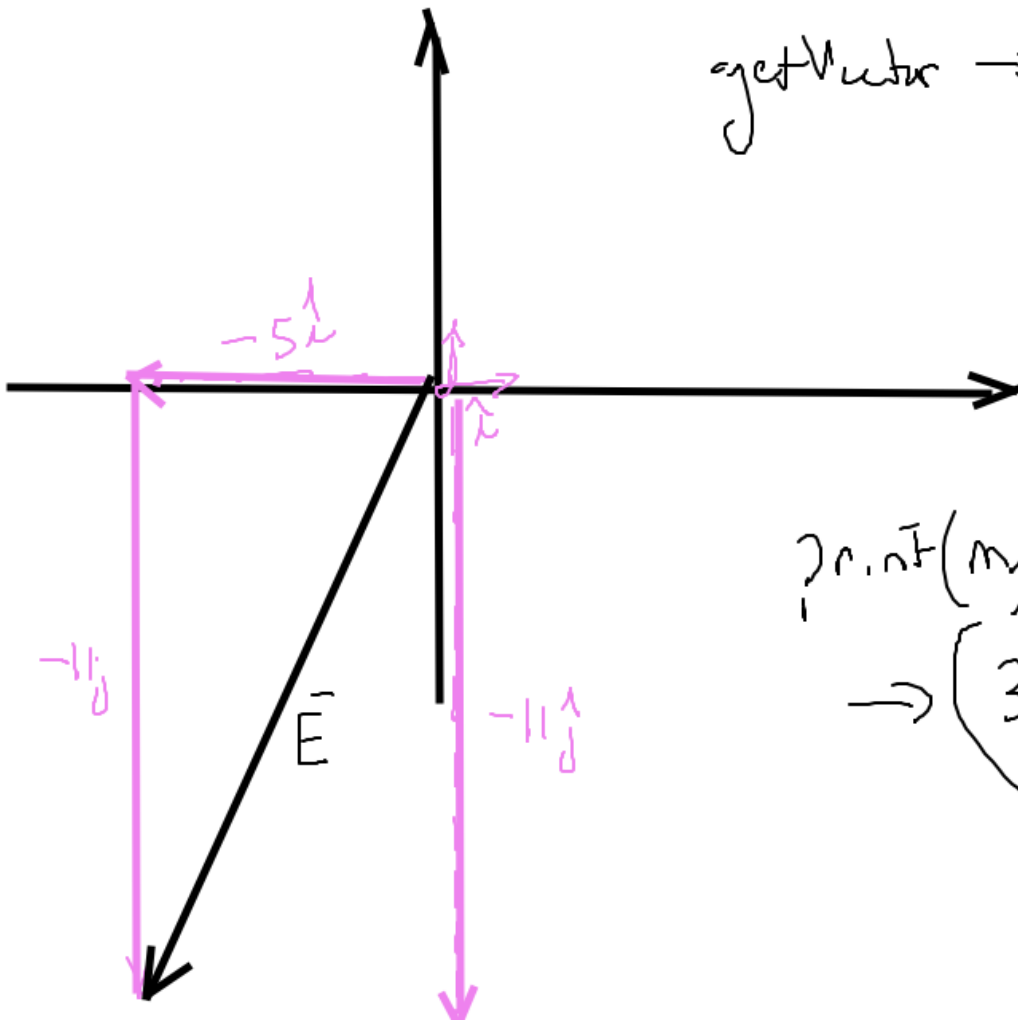


$$\bar{E} = \bar{B} \ominus \bar{C} = (-7 \ominus (-2))\hat{i} + (-1 \ominus 10)\hat{j}$$

$$= -5\hat{i} + (-11)\hat{j} = -5\hat{i} - 11\hat{j} = \bar{E}$$

$$E = -5\hat{x} - 11\hat{y}$$

getVector $\rightarrow (-5, -11)$
x-component
y-component



print(myVector)

$$\rightarrow (3\hat{x} + 7\hat{y})$$

$$\text{Vector} + \text{Vector} \Rightarrow \begin{pmatrix} \text{sum of } x \\ \text{comp} \end{pmatrix}^{\wedge} + \begin{pmatrix} \text{sum of } y \\ \text{comp} \end{pmatrix}^{\wedge}$$