Ortools CheatSheet Cheat Sheet

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Numpy

Create Empty Array of size n*m	np.empty((n,m), np.int_)
Create random array of size n*m in range [a b]	np.random.randint(a, b, (n, m))
Create array with all element equals to zeros	np.zeros((n,m), np.int_)
Create array with all element equals to Inf	np.full((1,n), np.inf)
Merge two array as a new array	np.concatenate((a,b))
Copy new array with new address and same value as a	np.copy(a)

```
location = np.zeros((n, 2), np.int_)
```

List

Appends an element to the end of the list	list.append()
Create array with all element equals to None	[None]*n
Delete item in an array by index	del a[index]

```
a = ["apple", "banana", "cherry"]
b = ["Ford", "BMW", "Volvo"]
for i in b:
a.append(i)
```

ortool_cp_sat

declare the model	model = cp_model.CpModel()
declare variable with boolean value	model.NewBoolVar(f'x{l}{j}]')

```
x = {}
for work in range(number_worker):
for task in range(number_task):
x[work,task] = model.NewBoolVar(f'x[{work}{task}]')
```

folium

```
folium.map(location, tiles, zoom_start)
```

Numba

Decorator	@jit, @njit
speed math	fastmath = True
cache function	cache= True
Parallel numba	nogil = True, parallel= True, for i in prange(n):
njit for empty list	@njit

```
@njit
def create_S()
S = List()
```

Matplotlib.pyplot

Draw points given long, lat	plt.plot(X, Y, 'ro')
Draw points vertically	plt.plot(*list(zip(*temp)),'ro')
draw line	plt.plot([x1, x2], [y1, y2],'ro)
change size of a figure	figure(figsize=(width, heigh), dpi=resolution)
show value on figure	plt.text(x, y, value)

```
plt.plot( [3, 2], [5,6], 'r-',
marker='o', markerfacecolor='b', markeredgecolor ='b', markersize =5, linewidth = 0.5, alpha=0.5 )

from matplotlib.pyplot import figure
figure(figsize=(8, 6), dpi=80)

plt.text(5,5,'Total demand = {} and number of sub tours = {}'
.format(weight.sum(),len(shortest_path)-1))
```

class

```
def __init__ (self,....)
```

Ortools

Restrict Vehicle	routing.VehicleVar(index).SetValues([-1, 2,3,4])
different limit constraint	routing.AddDimensionWithVehicleCapacity(demand-_callback_index, 0, # null capacity slack data['vehicle_capacities'], # vehicle maximum capacities True, # start cumul to zero 'Capacity')
find vehicle	VehicleVar(i)
first node after depot	start_var = routing.NextVar(routing.Start(vehicle_nbr))
	SetVehicleFixedCost
	AddDimensionWithVehicleCapacity
	SetVehicleCost
	https://acrogenesis.com/or-tools/documentation/user-_manual/manual/vrp/partial_routes.html
	ActiveVar(i) == (NextVar(i) != i).
	SetCumulVarSoftLowerBound(index_end, 2, 100000)