Interval Scheduling

January 29, 2025

[1]:
```
import random
```

[2]:
```
def random_request():
    return sorted(random.sample(range(0, 100), 2))
```

[4]:
```
def make_requests(n):
    return [random_request() for i in range(n)]
    # The way below works, but is less efficient
    # requests = []
    # for i in range(n):
    #     requests.append(random_request())
    # return requests
```

[5]:
```
make_requests(5)
```

[5]:
```
[[20, 87], [25, 71], [36, 79], [42, 92], [26, 92]]
```

[6]:
```
def greedy_solution(requests):
    # requests is a list of lists of length 2
    # representing the requested meeting times
    sorted_requests = sorted(requests, key=lambda r : r[1])
    solution = []

    # remove the first element of sorted_requests and add it
    # to the solution list
    solution.append(sorted_requests.pop(0))

    while len(sorted_requests) > 0:
        request = sorted_requests.pop(0)
        if request[0] >= solution[-1][1]:
            # no conflict
            solution.append(request)

    return solution
```

[7]:
```
def plot_requests(requests):
    for r in sorted(requests, key=lambda x : x[1]):
```

```
        print(" "*(r[0]) + "-"*(r[1]-r[0]))
```

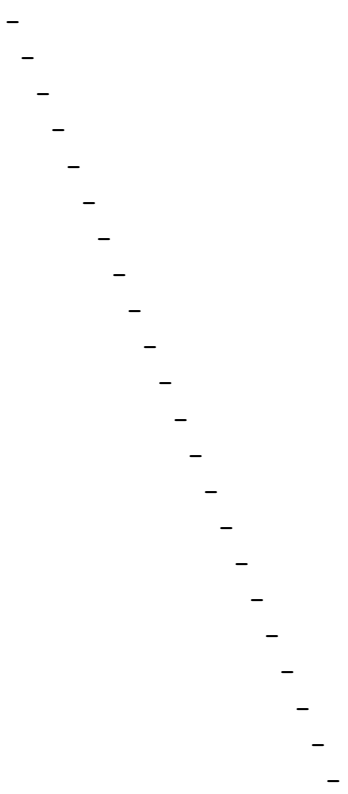
[20]:
```
requests = make_requests(100_000)
#print(requests)
```

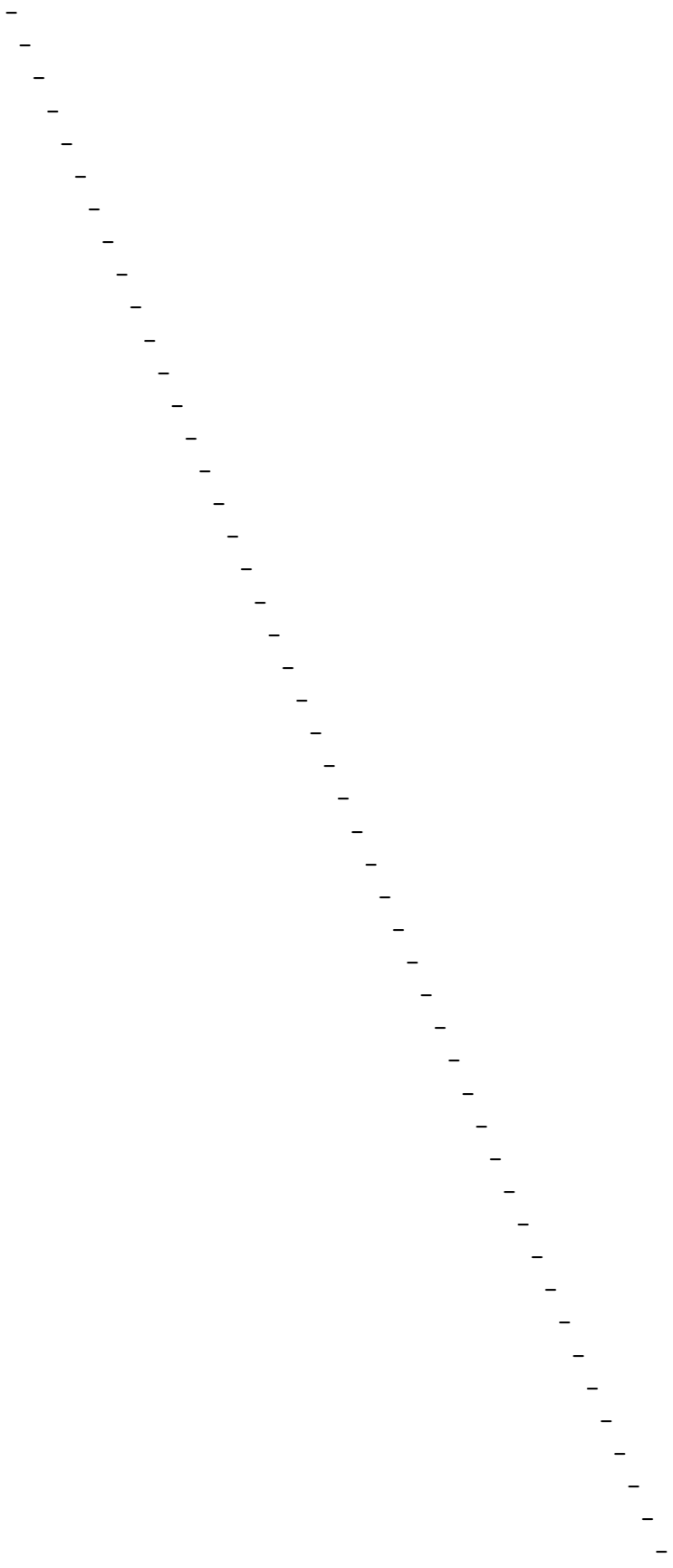
[21]:
```
#plot_requests(requests)
```

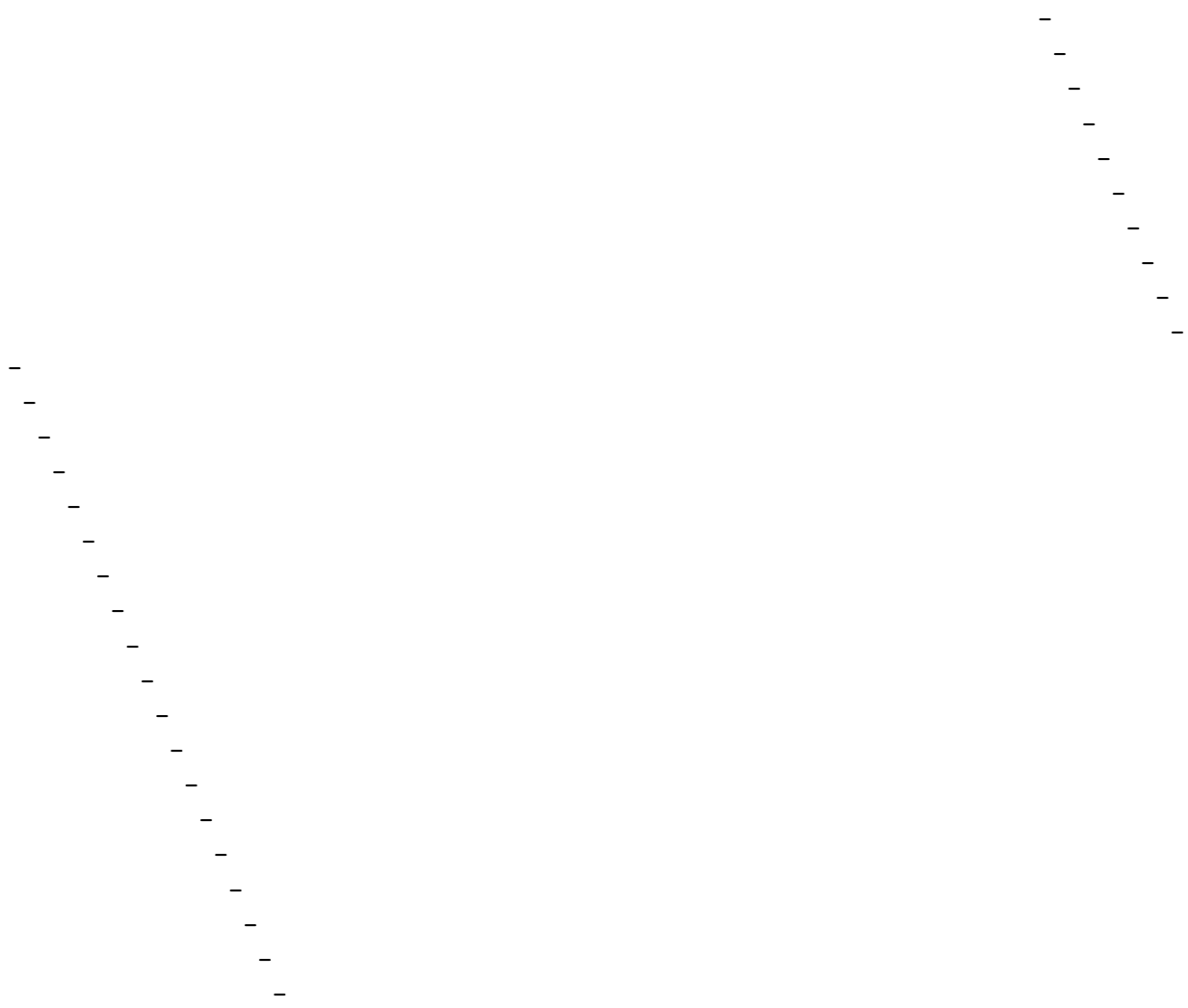
[22]:
```
greedy_sol = greedy_solution(requests)
print(greedy_sol)
```

```
[[0, 1], [1, 2], [2, 3], [3, 4], [4, 5], [5, 6], [6, 7], [7, 8], [8, 9], [9,
10], [10, 11], [11, 12], [12, 13], [13, 14], [14, 15], [15, 16], [16, 17], [17,
18], [18, 19], [19, 20], [20, 21], [21, 22], [22, 23], [23, 24], [24, 25], [25,
26], [26, 27], [27, 28], [28, 29], [29, 30], [30, 31], [31, 32], [32, 33], [33,
34], [34, 35], [35, 36], [36, 37], [37, 38], [38, 39], [39, 40], [40, 41], [41,
42], [42, 43], [43, 44], [44, 45], [45, 46], [46, 47], [47, 48], [48, 49], [49,
50], [50, 51], [51, 52], [52, 53], [53, 54], [54, 55], [55, 56], [56, 57], [57,
58], [58, 59], [59, 60], [60, 61], [61, 62], [62, 63], [63, 64], [64, 65], [65,
66], [66, 67], [67, 68], [68, 69], [69, 70], [70, 71], [71, 72], [72, 73], [73,
74], [74, 75], [75, 76], [76, 77], [77, 78], [78, 79], [79, 80], [80, 81], [81,
82], [82, 83], [83, 84], [84, 85], [85, 86], [86, 87], [87, 88], [88, 89], [89,
90], [90, 91], [91, 92], [92, 93], [93, 94], [94, 95], [95, 96], [96, 97], [97,
98], [98, 99]]
```

[23]:
```
plot_requests(greedy_sol)
```







[25]:
```
len(set(map(tuple,requests)))
```

[25]: 4950

[ ]:
```

```