

The screenshot of kubectl get nodes:

```
● student@ds-student3:~$ kubectl get nodes
NAME                 STATUS    ROLES    AGE   VERSION
kind-control-plane   Ready    control-plane   41d   v1.29.2
kind-worker           Ready    <none>         41d   v1.29.2
kind-worker2          Ready    <none>         41d   v1.29.2
```

The screenshot of passing all the unit tests:

```
root@eae356678159:/go/src/app# go test -v ./...
?      my-scheduler-plugins/cmd/scheduler   [no test files]
=== RUN   TestCustomScheduler_Prefilter
=== RUN   TestCustomScheduler_Prefilter/pod_is_accepted
finish adding2024/06/12 17:01:46 Pod  is in Prefilter phase.
=== RUN   TestCustomScheduler_Prefilter/pod_is_just_accepted
finish adding2024/06/12 17:01:46 Pod  is in Prefilter phase.
=== RUN   TestCustomScheduler_Prefilter/pod_is_rejected
finish adding2024/06/12 17:01:46 Pod  is in Prefilter phase.
--- PASS: TestCustomScheduler_Prefilter (0.00s)
    --- PASS: TestCustomScheduler_Prefilter/pod_is_accepted (0.00s)
    --- PASS: TestCustomScheduler_Prefilter/pod_is_just_accepted (0.00s)
    --- PASS: TestCustomScheduler_Prefilter/pod_is_rejected (0.00s)
=== RUN   TestCustomScheduler_Score
=== RUN   TestCustomScheduler_Score/least_mode
2024/06/12 17:01:46 Custom scheduler runs with the mode: Least.
2024/06/12 17:01:46 Pod  is in Score phase. Calculate the score of Node m1.
2024/06/12 17:01:46 Pod  is in Score phase. Calculate the score of Node m2.
=== RUN   TestCustomScheduler_Score/most_mode
2024/06/12 17:01:46 Custom scheduler runs with the mode: Least.
2024/06/12 17:01:46 Pod  is in Score phase. Calculate the score of Node m1.
2024/06/12 17:01:46 Pod  is in Score phase. Calculate the score of Node m2.
--- PASS: TestCustomScheduler_Score (0.00s)
    --- PASS: TestCustomScheduler_Score/least_mode (0.00s)
    --- PASS: TestCustomScheduler_Score/most_mode (0.00s)
=== RUN   TestCustomScheduler_NormalizeScore
=== RUN   TestCustomScheduler_NormalizeScore/scores_in_range
=== RUN   TestCustomScheduler_NormalizeScore/scores_out_of_range
=== RUN   TestCustomScheduler_NormalizeScore/negative_score
--- PASS: TestCustomScheduler_NormalizeScore (0.00s)
    --- PASS: TestCustomScheduler_NormalizeScore/scores_in_range (0.00s)
    --- PASS: TestCustomScheduler_NormalizeScore/scores_out_of_range (0.00s)
    --- PASS: TestCustomScheduler_NormalizeScore/negative_score (0.00s)
PASS
ok      my-scheduler-plugins/pkg/plugins    0.031s
```

Validate the implementation:

First, I create two pods, then we can see that they keep pending because of our prefilter mechanism.

```
● student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl create -f p1.yaml
pod/1 created
● student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl create -f p2.yaml
pod/2 created
● student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
1                                  0/1     Pending   0           22s
2                                  0/1     Pending   0           15s
my-scheduler-69cfc986c7-lwv2k     1/1     Running   0           4m42s
```

```

I0612 17:10:19.027171      1 log.go:194] Pod 1 is in Prefilter phase.
I0612 17:10:19.028248      1 schedule_one.go:867] "Unable to schedule pod; no fit; waiting" pod="default/1" err="0/3 nodes are available:
Pods in group are less than minAvailable. preemption: 0/3 nodes are available: 3 No preemption victims found for incoming pod.."
I0612 17:10:26.748454      1 log.go:194] Pod 2 is in Prefilter phase.
I0612 17:10:26.748804      1 schedule_one.go:867] "Unable to schedule pod; no fit; waiting" pod="default/2" err="0/3 nodes are available:
Pods in group are less than minAvailable. preemption: 0/3 nodes are available: 3 No preemption victims found for incoming pod.."

```

Secondly, I create the third pod, then we can see that it runs immediately because we have three pods in podGroup:"A", "prefilter" is correct.

```

● student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl create -f p3.yaml
pod/3 created
● student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl get pods

```

NAME	READY	STATUS	RESTARTS	AGE
1	0/1	Pending	0	83s
2	0/1	Pending	0	76s
3	1/1	Running	0	9s
my-scheduler-69cfc986c7-lwv2k	1/1	Running	0	5m43s

```

I0612 17:11:33.094152      1 log.go:194] Pod 3 is in Prefilter phase.
I0612 17:11:33.095380      1 log.go:194] Pod 3 is in Score phase. Calculate the score of Node kind-worker.
I0612 17:11:33.095441      1 log.go:194] Pod 3 is in Score phase. Calculate the score of Node kind-worker2.
I0612 17:11:33.102043      1 schedule_one.go:252] "Successfully bound pod to node" pod="default/3" node="kind-worker" evaluatedNodes=3 feasibleNodes=2

```

The third pod is bound to "kind-worker", then we further look up the allocable memory of "kind-worker" and "kind-worker2". Since "kind-worker" has smaller allocable memory, "Least Mode" is correct. (Initially we use "Least Mode".)

```

● student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl get po -o wide

```

NAME	READY	STATUS	RESTARTS	AGE	IP	NODE	NOMINATED NODE	READINESS GATES
1	0/1	Pending	0	2m28s	<none>	<none>	<none>	<none>
2	0/1	Pending	0	2m21s	<none>	<none>	<none>	<none>
3	1/1	Running	0	74s	10.244.2.4	kind-worker	<none>	<none>
my-scheduler-69cfc986c7-lwv2k	1/1	Running	0	6m48s	10.244.1.4	kind-worker2	<none>	<none>

Addresses:		Addresses:	
InternalIP:	172.24.0.3	InternalIP:	172.24.0.2
Hostname:	kind-worker	Hostname:	kind-worker2
Capacity:		Capacity:	
cpu:	6	cpu:	6
ephemeral-storage:	50620216Ki	ephemeral-storage:	50620216Ki
hugepages-2Mi:	0	hugepages-2Mi:	0
memory:	6063028Ki	memory:	6063028Ki
pods:	110	pods:	110
Allocatable:		Allocatable:	
cpu:	6	cpu:	6
ephemeral-storage:	50620216Ki	ephemeral-storage:	50620216Ki
hugepages-2Mi:	0	hugepages-2Mi:	0
memory:	1344436Ki	memory:	1868724Ki
pods:	110	pods:	110

To validate "Most Mode" is correct, I modify "values.yaml" and turn "Least" into "Most". Repeat the steps above. We can see that the third pod is bound to "kind-worker2" now, so "Most Mode" is correct.

```

student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl create -f p1.yaml
pod/1 created
student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl create -f p2.yaml
pod/2 created
student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl create -f p3.yaml
pod/3 created
student@ds-student3:~/NTHU-Scheduler-Plugin$ kubectl get pod -o wide

```

NAME	READY	STATUS	RESTARTS	AGE	IP	NODE	NOMINATED NODE	READINESS GATES
1	0/1	Pending	0	20s	<none>	<none>	<none>	<none>
2	0/1	Pending	0	13s	<none>	<none>	<none>	<none>
3	0/1	ContainerCreating	0	6s	<none>	kind-worker2	<none>	<none>
my-scheduler-69cfc986c7-79b82	1/1	Running	0	68s	10.244.1.5	kind-worker2	<none>	<none>

Feedback: Awesome!!!