In [5]:
```
%matplotlib notebook
%pylab
```

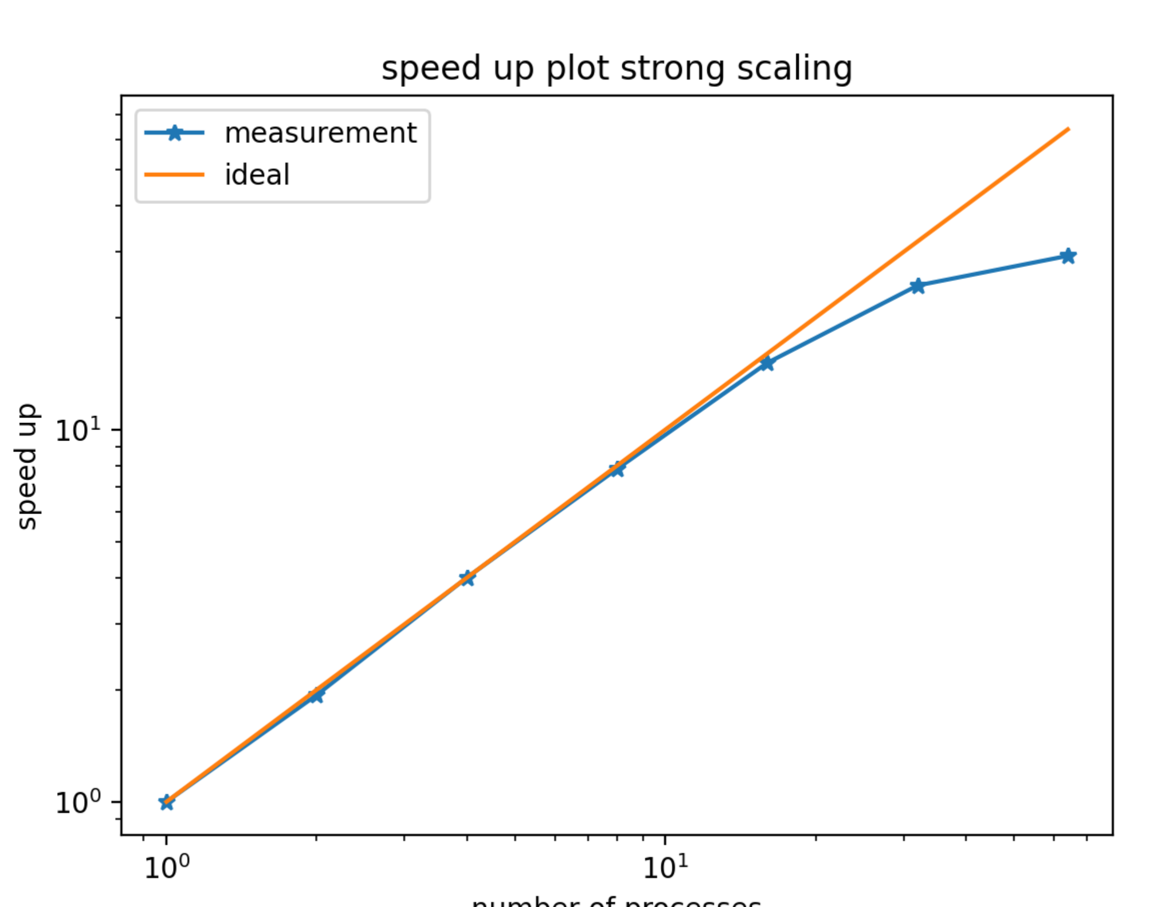
```
Using matplotlib backend: nbAgg
Populating the interactive namespace from numpy and matplotlib
```

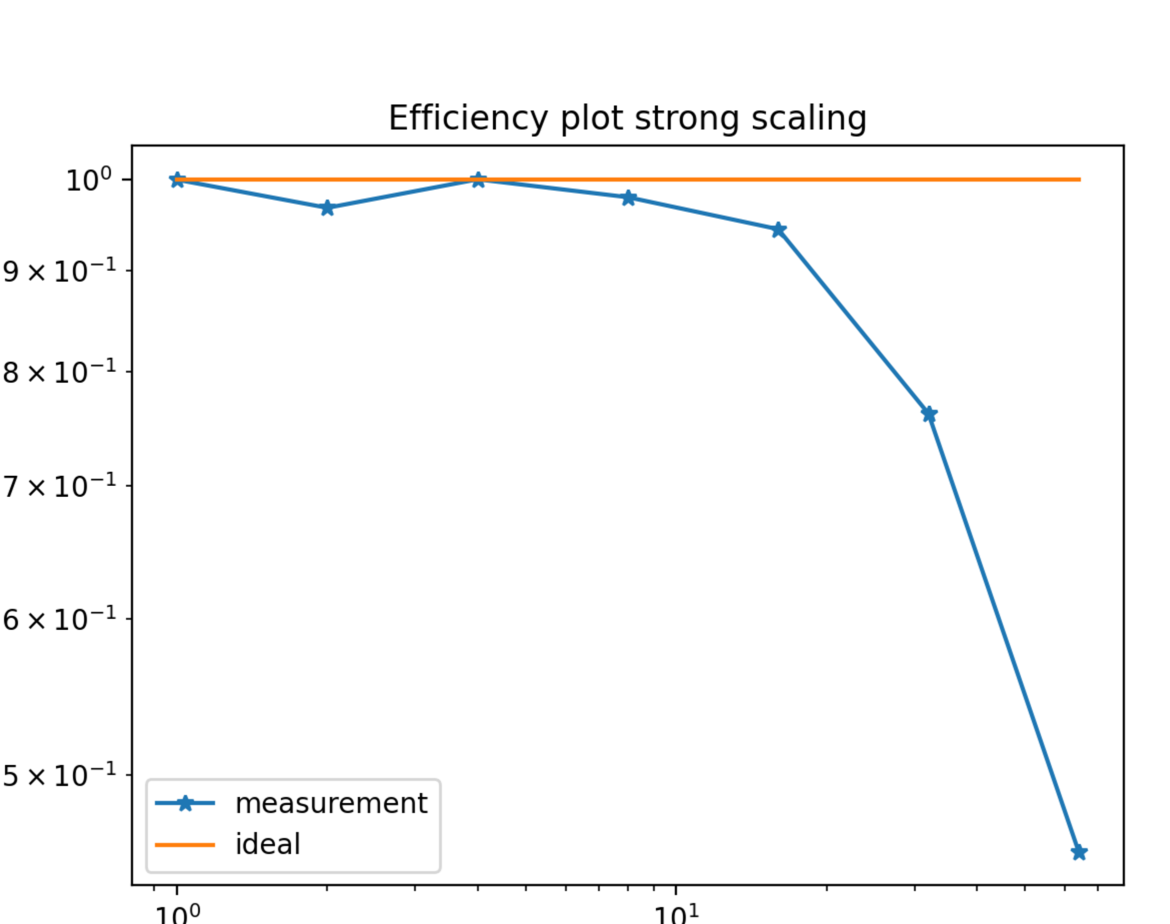
Task 1

no.1

In [24]:
```
#strong scaling
# number of processors
np = array([1,2,4,8,16,32,64])

#serial time
T1 = 8.902195

#parallel time
Tp = array([8.902195,4.598994,2.224560,1.135647,0.589346,0.365254,0.304099])

#speed up
s = T1/Tp

#efficiency plot
eff = s/np

e = sw/sw
```

In [25]:
```
figure(1)
loglog(np,s,"-*",label='measurement')
loglog(np,np,label='ideal')
ylabel("speed up")
xlabel("number of processes")
title("speed up plot strong scaling")
legend()
figure(2)
loglog(np,eff,"-*",label='measurement')
loglog(np,e,label='ideal')
title("Efficiency plot strong scaling")
ylabel("efficiency")
xlabel("number of processes")
legend()
show()
```



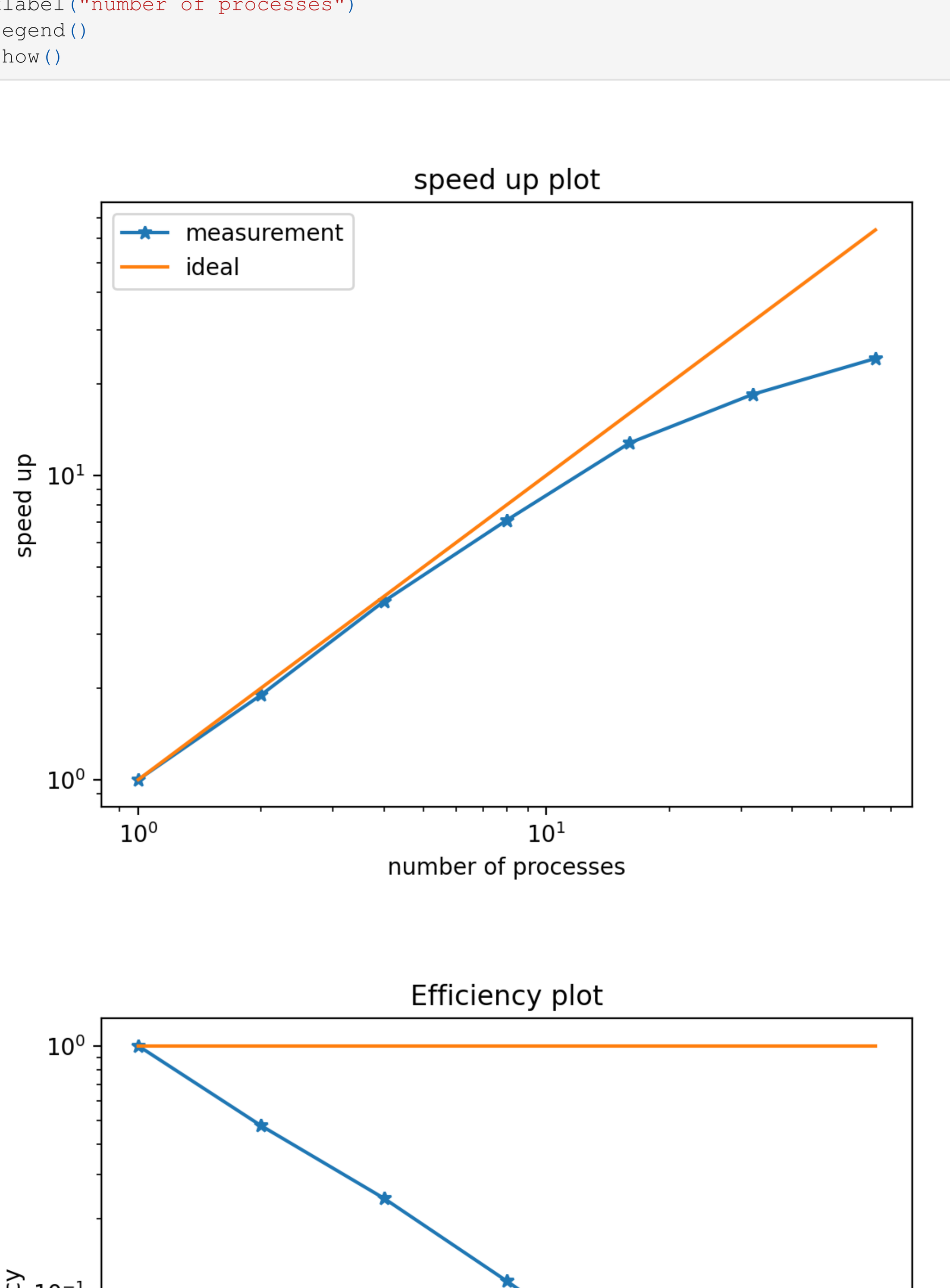


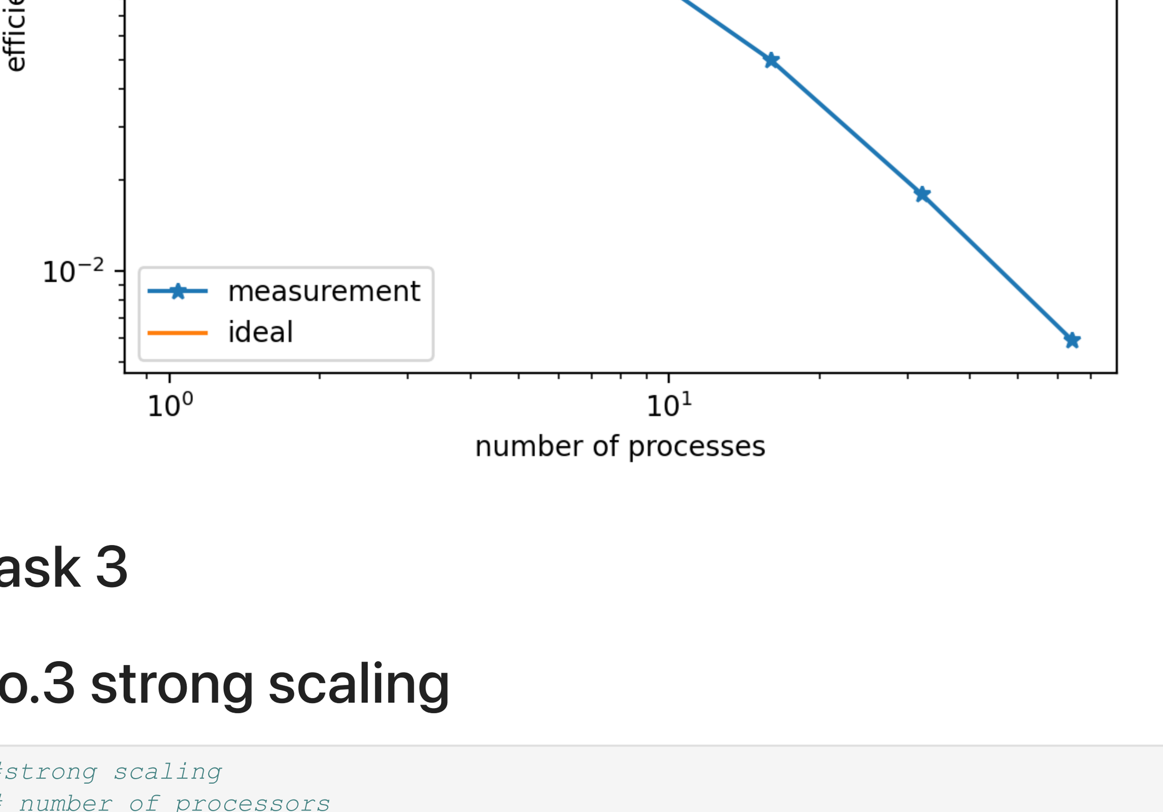
In [ ]:

no.2

In [26]:
```
#weak scaling
#serial time
Tw1 = 0.116381

#parallel time
Twp = array([0.116381,0.122599,0.120756,0.130732,0.145758,0.201987,0.307796])
#speed up
sw1 = np*Tw1/Twp
sw = Tw1/Twp

#efficiency plot
effw = sw/np
e = sw/sw
```

In [27]:
```
figure(3)
loglog(np,sw1,"-*",label='measurement')
loglog(np,np,label='ideal')
ylabel("speed up")
xlabel("number of processes")
legend()
title("speed up plot")
figure(4)
loglog(np,effw,"-*",label='measurement')
loglog(np,e,label='ideal')
title("Efficiency plot")
ylabel("efficiency")
xlabel("number of processes")
legend()
show()
```



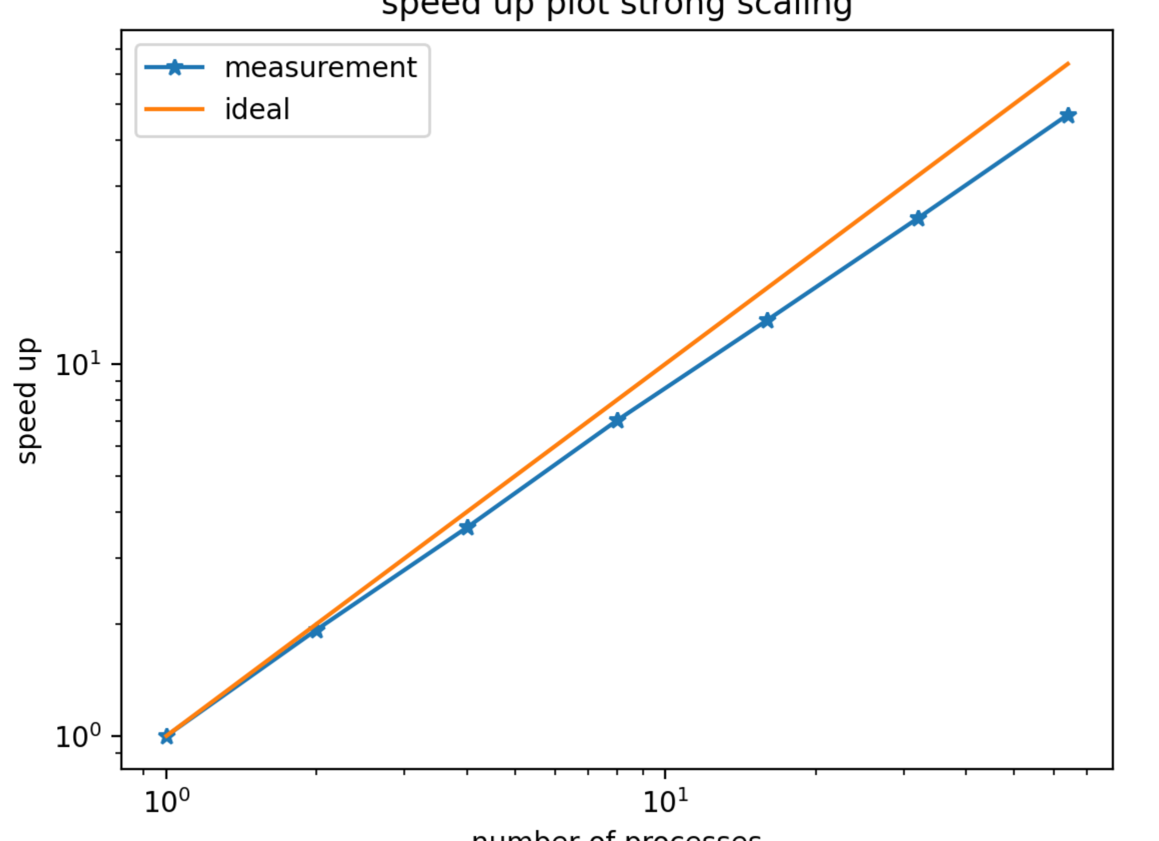


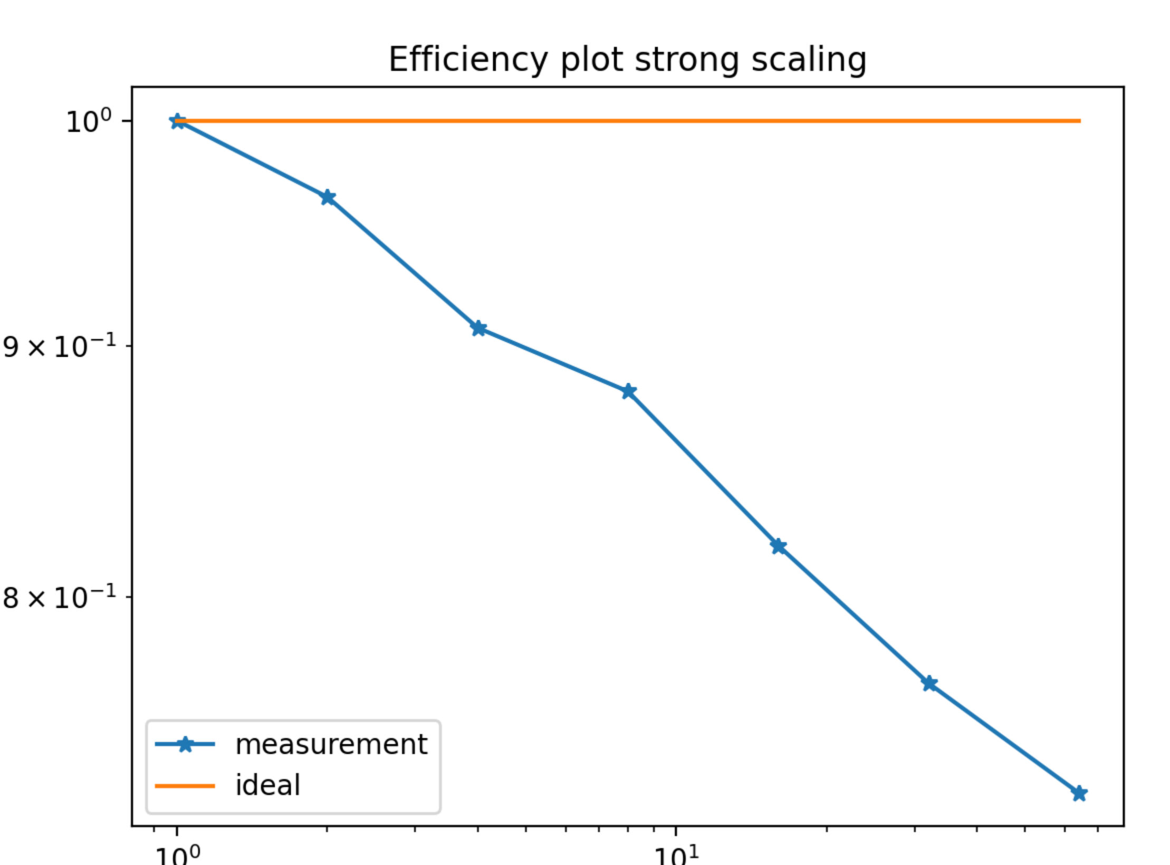
Task 3

no.3 strong scaling

In [28]:
```
#strong scaling
# number of processors
np = array([1,2,4,8,16,32,64])

#serial time
T1 = 10.847608

#parallel time
Tp = array([10.847608,5.621049,2.988099,1.539187,0.827202,0.441136,0.232195])

#speed up
s = T1/Tp

#efficiency plot
eff = s/np
```

In [29]:
```
figure(5)
loglog(np,s,"-*",label='measurement')
loglog(np,np,label='ideal')
legend()
ylabel("speed up")
xlabel("number of processes")
title("speed up plot strong scaling")
figure(6)
loglog(np,eff,"-*",label='measurement')
loglog(np,e,label='ideal')
title("Efficiency plot strong scaling")
ylabel("efficiency")
legend()
xlabel("number of processes")
show()
```

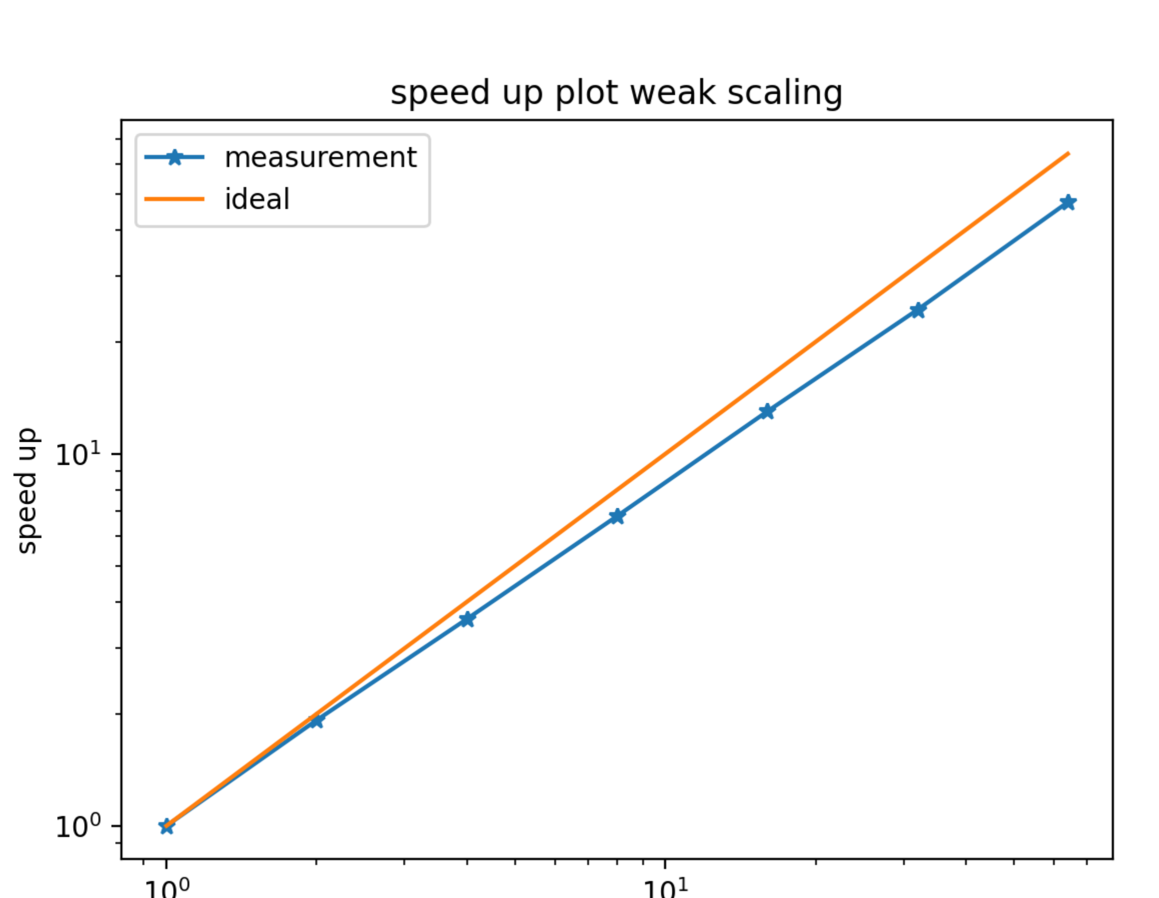


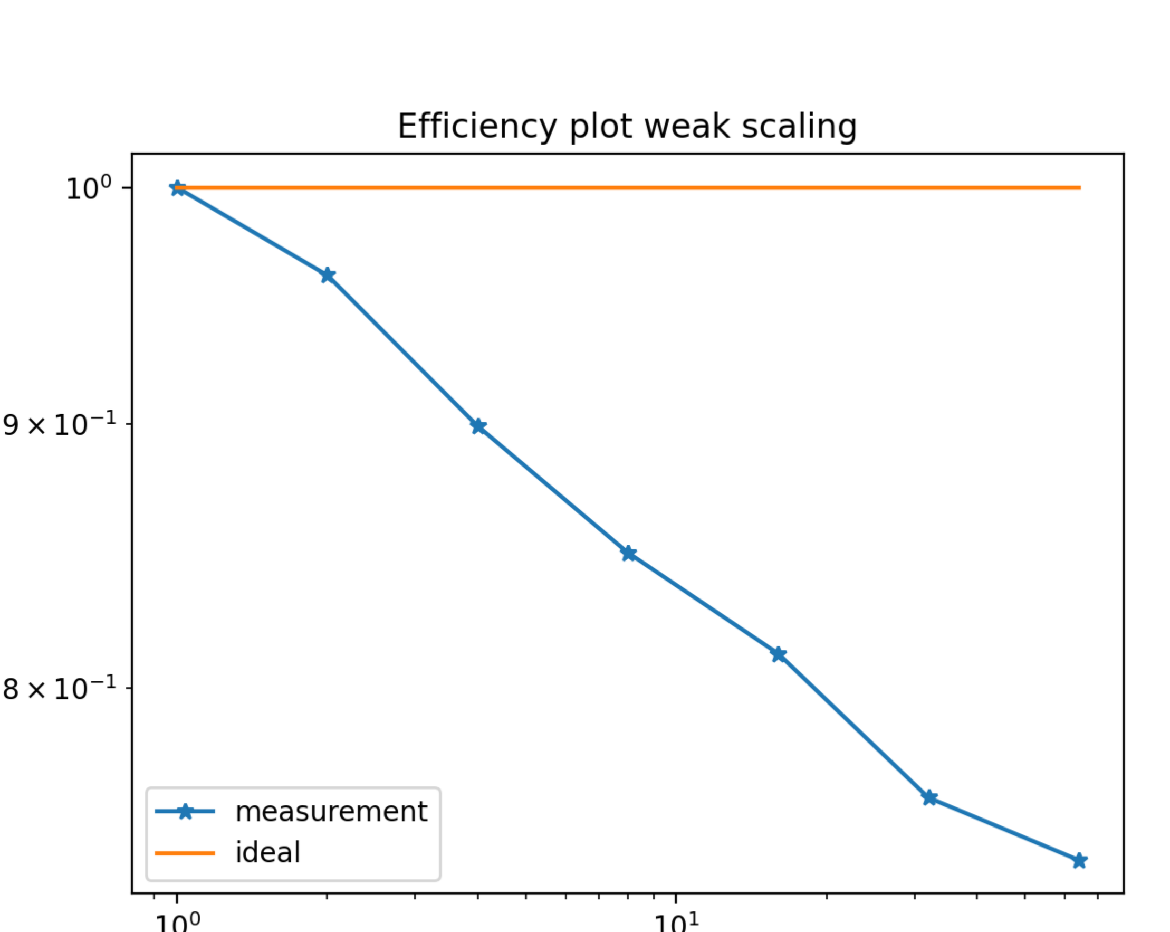


no.4 weak scaling

In [30]:
```
#weak scaling
# number of processors
np = array([1,2,4,8,16,32,64])

#serial time
T1 = 10.753679

#parallel time
Tp = array([10.753679,5.591031,2.989730,1.581634,0.827177,0.440994,0.226710])

#speed up
s = T1/Tp

#efficiency plot
eff = s/np
```

In [31]:
```
figure(7)
loglog(np,s,"-*",label='measurement')
loglog(np,np,label='ideal')
legend()
ylabel("speed up")
xlabel("number of processes")
title("speed up plot weak scaling")
figure(8)
loglog(np,eff,"-*",label='measurement')
loglog(np,e,label='ideal')
title("Efficiency plot weak scaling")
ylabel("efficiency")
xlabel("number of processes")
legend()
show()
```





In [ ]:

In [3]:
```
!pip install run pyppeteer-install
```

```
Collecting run
  Downloading run-0.2.tar.gz (3.2 kB)
    ERROR: Command errored out with exit status 1:
     command: /opt/anaconda3/bin/python -c 'import sys, setuptools, tokenize; sys.argv
[0] = '"'"'/private/var/folders/wb/55mw2drx2y15qr4p01jy431w0000gn/T/pip-install-13e398
4i/run/setup.py'"'"'; __file__='"'"'/private/var/folders/wb/55mw2drx2y15qr4p01jy431w00
00gn/T/pip-install-13e3984i/run/setup.py'"'"';f=getattr(tokenize, '"'"'open'"'"', ope
n)(__file__);code=f.read().replace('"'"'\r\n'"'"', '"'"'\n'"'"');f.close();exec(compil
e(code, __file__, '"'"'exec'"'"'))' egg_info --egg-base /private/var/folders/wb/55mw2d
rx2y15qr4p01jy431w0000gn/T/pip-pip-egg-info-lw21wai9
         cwd: /private/var/folders/wb/55mw2drx2y15qr4p01jy431w0000gn/T/pip-install-13e
3984i/run/
    Complete output (5 lines):
    Traceback (most recent call last):
      File "<string>", line 1, in <module>
      File "/private/var/folders/wb/55mw2drx2y15qr4p01jy431w0000gn/T/pip-install-13e39
84i/run/setup.py", line 12, in <module>
        long_description=file('README').read(),
    NameError: name 'file' is not defined
    ----------------------------------------
ERROR: Command errored out with exit status 1: python setup.py egg_info Check the logs
 for full command output.
```

In [ ]:

In [ ]: