In [ ]:
```
# import necessary packages
import numpy as np
import scipy.special as ss
import matplotlib.pyplot as plt
from copy import deepcopy
from scipy.constants import *
from matplotlib.patches import Circle
from scipy.integrate import quad,dblquad
from ipywidgets import interactive
from scipy.special import fresnel
from mpl_toolkits.mplot3d import axes3d
```

1. np.where(): How to deal with singular points?

Plot

$$sinc(x) = \frac{sin(\pi x)}{\pi x}$$

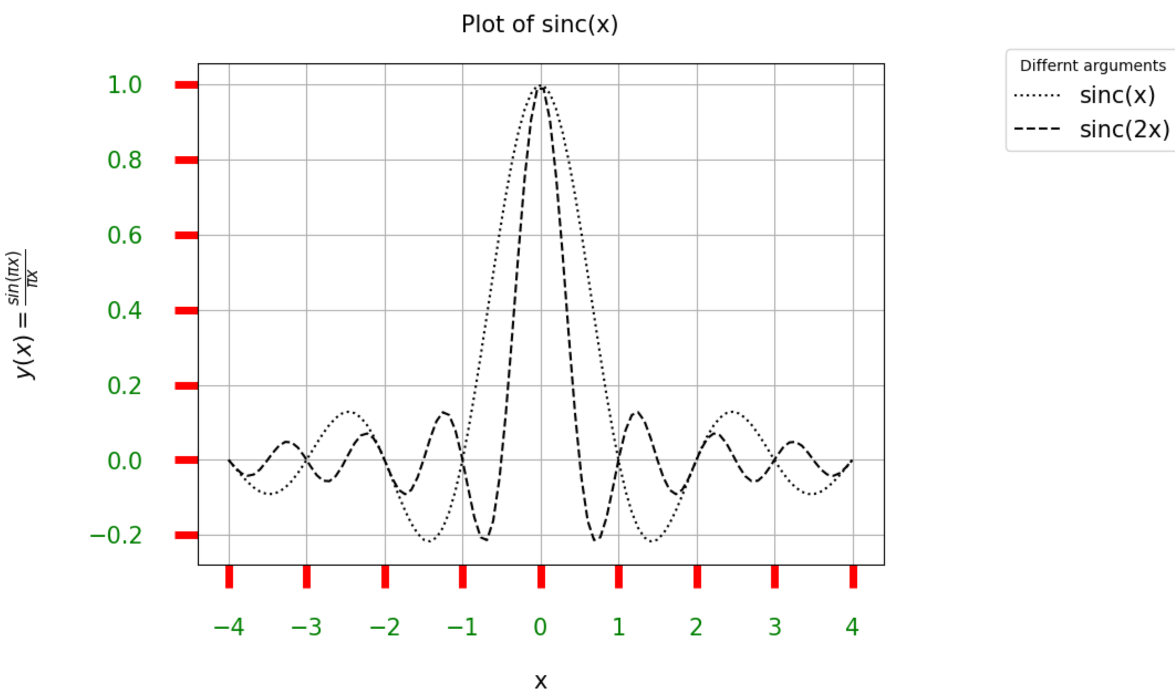
Explicitly handle the case where x=0.

In [ ]:
```
def sinc(x):
  arg=np.pi*np.where(x==0,1e-15,x)
  # arg=np.pi*x
  y=np.sin(arg)/arg
  return y
```

In [ ]:
```
def interactive_plot(a=11):
  x=np.linspace(-5,5,a)
  y=sinc(x)
  plt.plot(x,y)

interactive(interactive_plot,a=(11,101,10))
```

You can see that there was no divide by zero error.

In [ ]:
```
fig,ax=plt.subplots(figsize=(8,6),dpi=100)

ax.plot(x,sinc(x),label='sinc(x)',c='black',ls=':')
#ax.plot(x,sinc(x),label='sinc(x)',marker='^',c='black',mfc='red',mew=3.0,mec
='blue',ms=10,ls='-.')
ax.set_xlabel('x',fontsize=15,labelpad=20)
ax.set_ylabel('$y(x)=\\frac{sin(\pi x)}{\pi x}$',fontsize=15,labelpad=30)
# ax.set_title('Plot of sinc(x)',fontsize=15)

ax.plot(x,sinc(2*x),label='sinc(2x)',c='black',ls='--')
#ax.plot(x,sinc(2*x),label='sinc(2x)',marker='v',c='black')
# ax.set_xlabel('x',fontsize=15)
# ax.set_ylabel('$y(x)=\\frac{sin(\pi x)}{\pi x}$',fontsize=15)
ax.set_title('Plot of sinc(x)',fontsize=15,pad=20)
# ax.legend(fontsize=15)
ax.legend(bbox_to_anchor=(1.45,1.05),loc=1,fontsize=15,title='Differnt argumen
ts')
# ax.legend(loc=3,fontsize=15)
ax.tick_params(axis='both',size=15,pad=20,width=5,color='red',labelsize=15,lab
elcolor='green')
#ax.tick_params(axis='both',labelsize=15,labelcolor='blue',color='green',width
=4,pad=20,size=15)
ax.grid()
```



Make color-blind friendly plots. Use linestyle or ls whenever you can.

2. Spirals

Cornu's Spiral: Use packages as much as you can

This is created out of Fresnel integrals with usage in optics and are given by

$$C(l) = \int_0^l \cos\left(\frac{\pi t^2}{2}\right) dt$$

and

$$S(l) = \int_0^l \sin\left(\frac{\pi t^2}{2}\right) dt$$

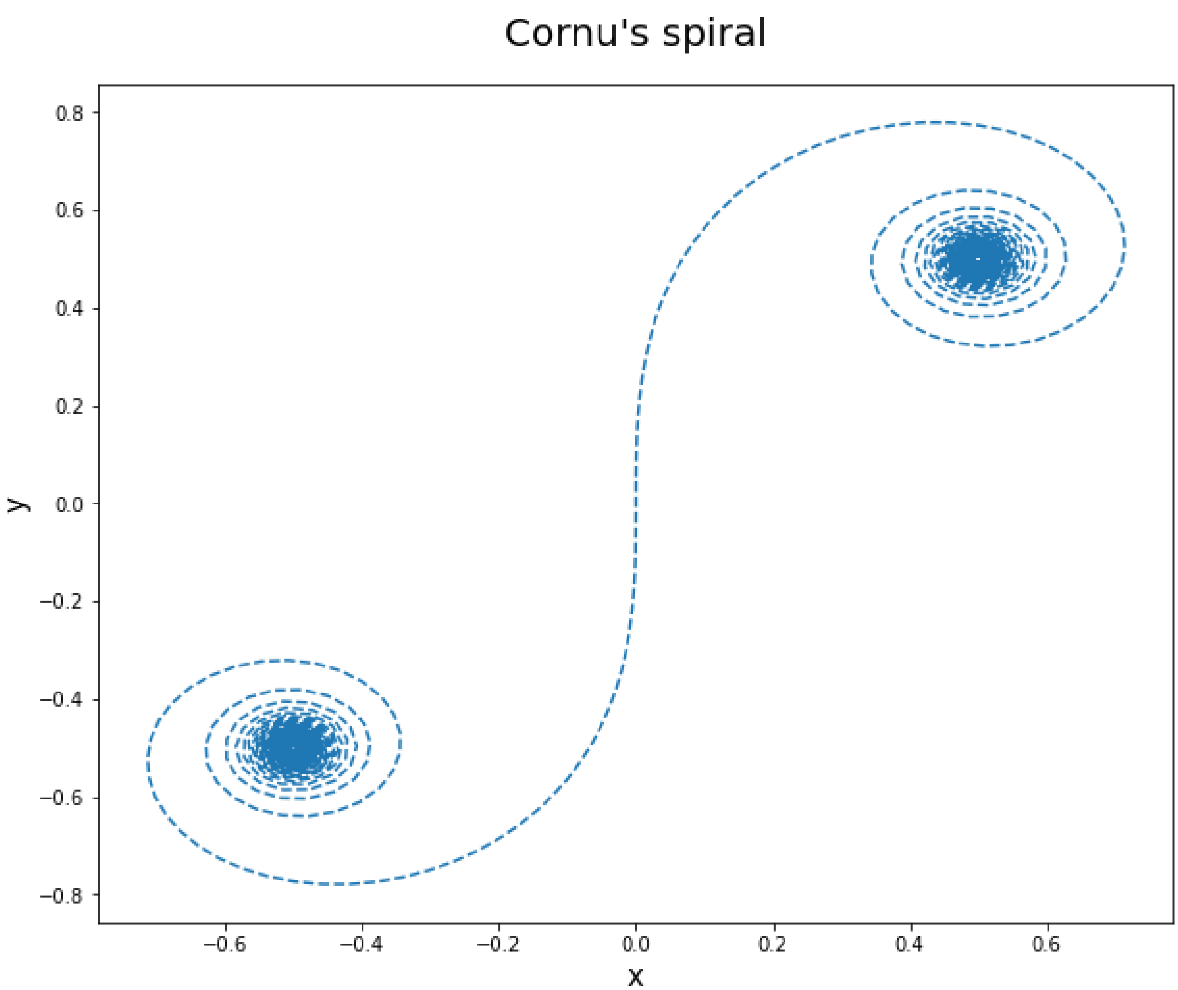
The parametric curve $(x(l), y(l)) = (C(l), S(l))$ is the Cornu's spiral. Use scipy package to plot this curve.

In [ ]:
```
a=1e3
a
```

Out[ ]:
```
1000.0
```

In [ ]:
```
l=np.linspace(-20,20,int(1e3))
plt.figure(figsize=(10,8))
C,S=fresnel(l)
plt.plot(C,S,ls='--')
plt.title("Cornu's spiral",fontsize=20,pad=20)
plt.xlabel('x',fontsize=15)
plt.ylabel('y',fontsize=15)
```

Out[ ]:
```
Text(0, 0.5, 'y')
```



H1: Prove that the angular acceleration on this curve is constant.

References:

1. CURVES: https://faculty.sites.iastate.edu/jia/files/inline-files/curves.pdf (https://faculty.sites.iastate.edu/jia/files/inline-files/curves.pdf)
2. CURVATURE: https://faculty.sites.iastate.edu/jia/files/inline-files/curvature.pdf (https://faculty.sites.iastate.edu/jia/files/inline-files/curvature.pdf)

Read these files in the order given.

Lituus Spiral: Interactive Polar Plot

In [ ]:
```
theta=np.linspace(0.1,12*np.pi,100)
def radial(a):
  return a/np.sqrt(theta)
```

In [ ]:
```
def interactive_plot(a=1):
  r=a/np.sqrt(theta)
  plt.figure(figsize=(10,8))
  plt.polar(theta,r,c='red')
  plt.title('Plot of a Lituus Spiral',fontsize=20,pad=20)

interactive(interactive_plot,a=(1,10,1))
```

H2: Prove that the magnetic field at the centre of the Lituus Spiral is $\frac{\mu_0 I}{3a}\sqrt{2\pi}$. See Griffiths' Electrodynamics Book Question 5.51

3. Bowditch Curves/Lissajous Figures: Adding Subplots

Consider two sinusoisal motions

$$y_1(t) = \sin{(t)}, y_2(t) = \sin{(nt + \phi)}$$

where n is an integer and ϕ is some offset. Make 4 subplots for various values of n and ϕ, but using only one for loop.

In [ ]:
```
print(np.pi/4)
```

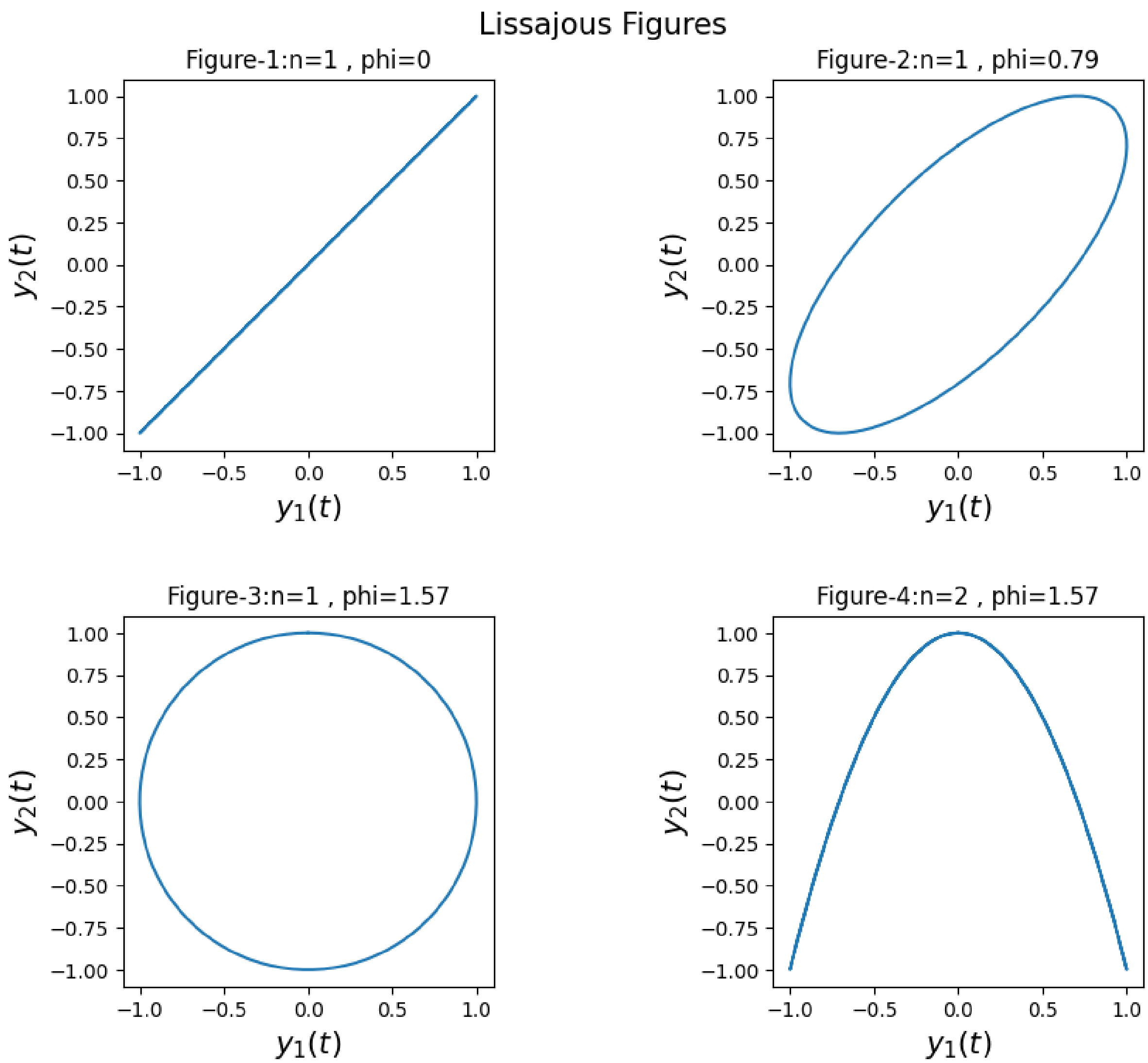
```
0.7853981633974483
```

In [ ]:

```
t=np.linspace(0,2*np.pi,100)
n=[1,1,1,2]
phi=[0,np.pi/4,np.pi/2,np.pi/2]
fig=plt.figure(figsize=(10,8),dpi=100)

for i in range(len(n)):
  ax=fig.add_subplot(2,2,i+1)
  ax.plot(np.sin(t),np.sin(n[i]*t+phi[i]))
  ax.set_xlabel('$y_1(t)$',fontsize=15)
  ax.set_ylabel('$y_2(t)$',fontsize=15)
  ax.set_title('Figure-'+str(i+1)+':'+'n='+ str(n[i])+ ' , phi=' + str(round(p
hi[i],2)))
  ax.set_aspect('equal')
fig.tight_layout(pad=3.0)
plt.suptitle('Lissajous Figures',fontsize=15)
```

Out[ ]:

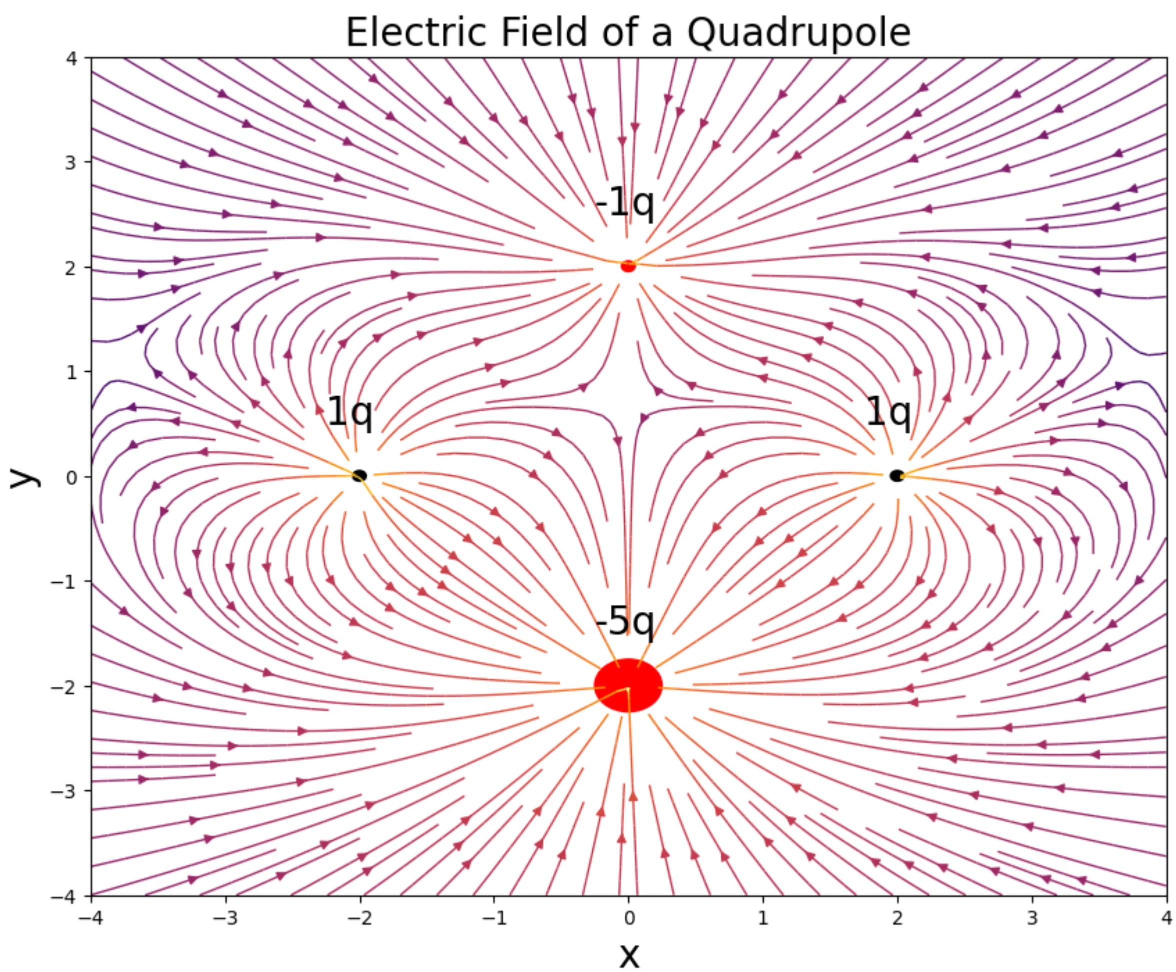
```
Text(0.5, 0.98, 'Lissajous Figures')
```



4. Fields in 2D

In [ ]:
```
total=100
figure, ax = plt.subplots(figsize=(10,8),dpi=100)
x=np.linspace(-4,4,total)
y=np.linspace(-4,4,total)
X,Y=np.meshgrid(x,y)

k=1/(4*np.pi*epsilon_0)
Ex=[[0]*total]*total
Ey=deepcopy(Ex)
# create a dictionary of charges

qpos={(-2,0): 1, (2,0): 1, (0,-2): -5, (0,2): -1}

for charge_loc,charge in qpos.items():
  if(charge>0):
    ax.add_artist(Circle(charge_loc,abs(charge)/20,color='black'))
  else:
    ax.add_artist(Circle(charge_loc,abs(charge)/20,color='red'))
  ax.text(charge_loc[0]-0.25,charge_loc[1]+0.5,s=str(charge)+'q',fontsize=20)

for charge_loc,charge in qpos.items():
  charge_xloc,charge_yloc=charge_loc
  R=np.sqrt((X-charge_xloc)**2+(Y-charge_yloc)**2)
  Ex+=charge*(X-charge_xloc)/R**3
  Ey+=charge*(Y-charge_yloc)/R**3

color=np.log((np.sqrt(Ex**2+Ey**2)))
print(color)

ax.streamplot(X, Y, Ex, Ey,color=color,linewidth=1,density=2, arrowstyle='-|>'
, arrowsize=1,cmap='inferno')
ax.set_xlabel('x',fontsize=20)
ax.set_ylabel('y',fontsize=20)
ax.set_title('Electric Field of a Quadrupole', fontsize=20)
print(len(color))
```

```
[[-1.56605413 -1.52972443 -1.4929474  ... -1.4929474  -1.52972443
  -1.56605413]
 [-1.55152628 -1.51454332 -1.47708347 ... -1.47708347 -1.51454332
  -1.55152628]
 [-1.53754117 -1.49990528 -1.46176211 ... -1.46176211 -1.49990528
  -1.53754117]
 ...
 [-2.56143154 -2.53709413 -2.51203164 ... -2.51203164 -2.53709413
  -2.56143154]
 [-2.56913043 -2.54515929 -2.52051088 ... -2.52051088 -2.54515929
  -2.56913043]
 [-2.577501   -2.55390671 -2.52968015 ... -2.52968015 -2.55390671
  -2.577501  ]]
100
```



References:

1. Hues, Lightness, Saturation: [https://vanseodesign.com/web-design/hue-saturation-and-lightness/ (https://vanseodesign.com/web-design/hue-saturation-and-lightness/)](https://vanseodesign.com/web-design/hue-saturation-and-lightness/)
2. Colormaps: [https://matplotlib.org/stable/tutorials/colors/colormaps.html (https://matplotlib.org/stable/tutorials/colors/colormaps.html)](https://matplotlib.org/stable/tutorials/colors/colormaps.html)

H3: Find out how the color scheme is working here.

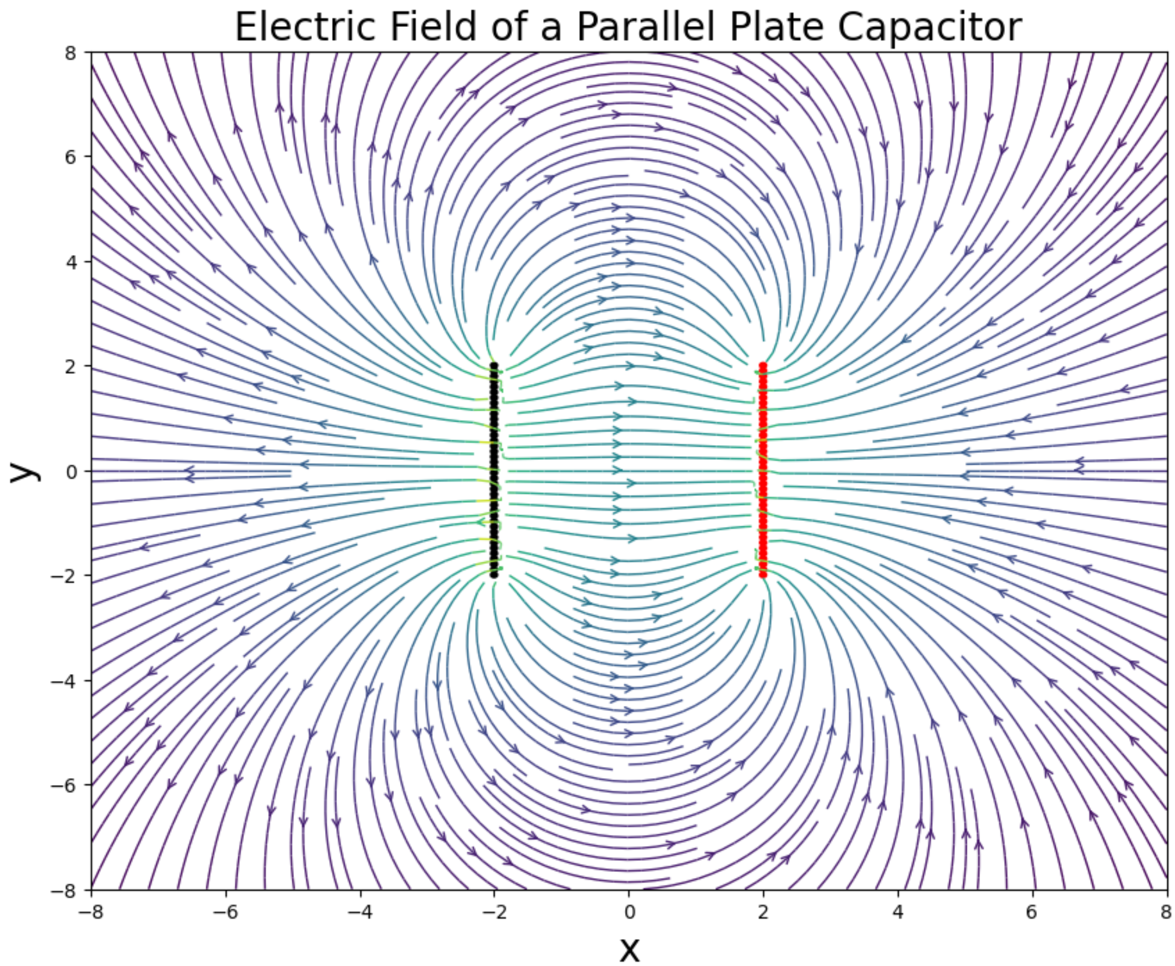
H4: Plot the electric field lines due to an octopole distribution. Distribute the 8 charges with alternating signs on a circle. Do not hardcore the charge locations. Use a for loop.

Electric Field due to a Parallel Plate Capacitor

In [ ]:

```
qpos={}
total_num_charges=40
int_dis=1e-2
for i in range(total_num_charges):
  qpos[(-2,4*i/(total_num_charges-1)-2)]=1
  qpos[(2,4*i/(total_num_charges-1)-2)]=-1

total=100
figure, ax = plt.subplots(figsize=(10,8),dpi=100)
x=np.linspace(-8,8,total)
y=np.linspace(-8,8,total)
X,Y=np.meshgrid(x,y)

k=1/(4*np.pi*epsilon_0)
Ex=[[0]*total]*total
Ey=deepcopy(Ex)

# qpos={1: (-2,0), 5: (2,0), -1: (0,-2), -5: (0,2)}
for charge_loc,charge in qpos.items():
  if(charge>0):
    ax.add_artist(Circle(charge_loc,abs(charge)/20,color='black'))
  else:
    ax.add_artist(Circle(charge_loc,abs(charge)/20,color='red'))

for charge_loc,charge in qpos.items():
  charge_xloc,charge_yloc=charge_loc
  R=np.sqrt((X-charge_xloc)**2+(Y-charge_yloc)**2)
  Ex+=charge*(X-charge_xloc)/R**3
  Ey+=charge*(Y-charge_yloc)/R**3

color=np.log((np.sqrt(Ex**2+Ey**2)))

ax.streamplot(X, Y, Ex, Ey, color=color,linewidth=1,cmap=plt.cm.viridis,densit
y=2.5, arrowstyle='->', arrowsize=1)
ax.set_xlabel('x',fontsize=20)
ax.set_ylabel('y',fontsize=20)
ax.set_title('Electric Field of a Parallel Plate Capacitor', fontsize=20)
```

Out[ ]: Text(0.5, 1.0, 'Electric Field of a Parallel Plate Capacitor')



5. Fields in 3D

Numerically integrate

$$I = \int_{-\infty}^{\infty} e^{-ax^2}\,dx$$

Pass a as an argument. The analytical value of I is

$$I = \sqrt{\frac{\pi}{a}}$$

Verify your numerical result against various values of a.

In [ ]:
```
def integrate(x,a):
  return np.exp(-a*x**2)
```

In [ ]:
```
a=2
ans=quad(integrate,-np.inf,np.inf,args=(a))[0]
print(ans,np.sqrt(np.pi/a))
#help(quad)
```

```
1.2533141373155017 1.2533141373155001
```

Let's now perform a double integral. We use dblquad. It returns the double (definite) integral of func(y, x) from x = a..b and y = gfun(x)..hfun(x). Perform the integration

$$I = \int_0^1 \int_{y=0}^{y=x} ay\, dydx$$

In [ ]:
```
def integrate(y,x,a):
  return a*y
a=2
ans=dblquad(integrate,0,1,lambda x:0, lambda x:x,args=[a])[0]
print(ans,a/6)
```

```
0.33333333333333337 0.3333333333333333
```

Reference: [https://problemsolvingwithpython.com/06-Plotting-with-Matplotlib/06.15-Quiver-and-Stream-Plots/ (https://problemsolvingwithpython.com/06-Plotting-with-Matplotlib/06.15-Quiver-and-Stream-Plots/)](https://problemsolvingwithpython.com/06-Plotting-with-Matplotlib/06.15-Quiver-and-Stream-Plots/)

Magnetic Field of a Cylindrical Bar Magnet

Question: Plot the magnetic field due to a small cylindrical bar magnet with magnetization $1000kA/m$.

Solution: Consider a cylinder with its center at the origin of the coordinate system. Conside a disk of infinitesimally small thickness dz'. The current in this disc flows in the azimuthal direction with value Mdz' since surface density $\vec{K}_{bound} = M\hat{\phi}$. The line element in the azimuthal direction (in cylindrical coordinate system (ρ, ϕ, z)) is $\overrightarrow{dl'} = (-\rho^{'} \sin{(\phi^{'})}\hat{x} + \rho^{'} \cos{(\phi^{'})}\hat{y})d\phi^{'}$, where the primed coordinates represent the source point. Let $\vec{r} = (x, y, z)$ represent the coodinates of a field point where these coordinates can take values from $(-100, 100)$ cm. Let the coordinates of the source point be $\overrightarrow{r'} = (\rho^{'} \cos{(\phi^{'})}, \rho^{'} \sin{(\phi^{'})}, z')$. Therefore, the magnetic field $\vec{B}$ is given by

$$\vec{B} = \frac{\mu_0 M}{4\pi} \int_{-z_{min}}^{z_{max}} \int_0^{2\pi} \frac{\overrightarrow{dl'} \times (\vec{r} - \overrightarrow{r'})}{\left|\vec{r} - \overrightarrow{r'}\right|^3} dz' d\phi'$$

Using tha above formula, we can calculate the components of the magnetic field B_x,B_y ,B_z. We first create a meshgrid and then using quiver plots, plot the field components.

H5: Plot the magnetic field with the magnet in 3d.

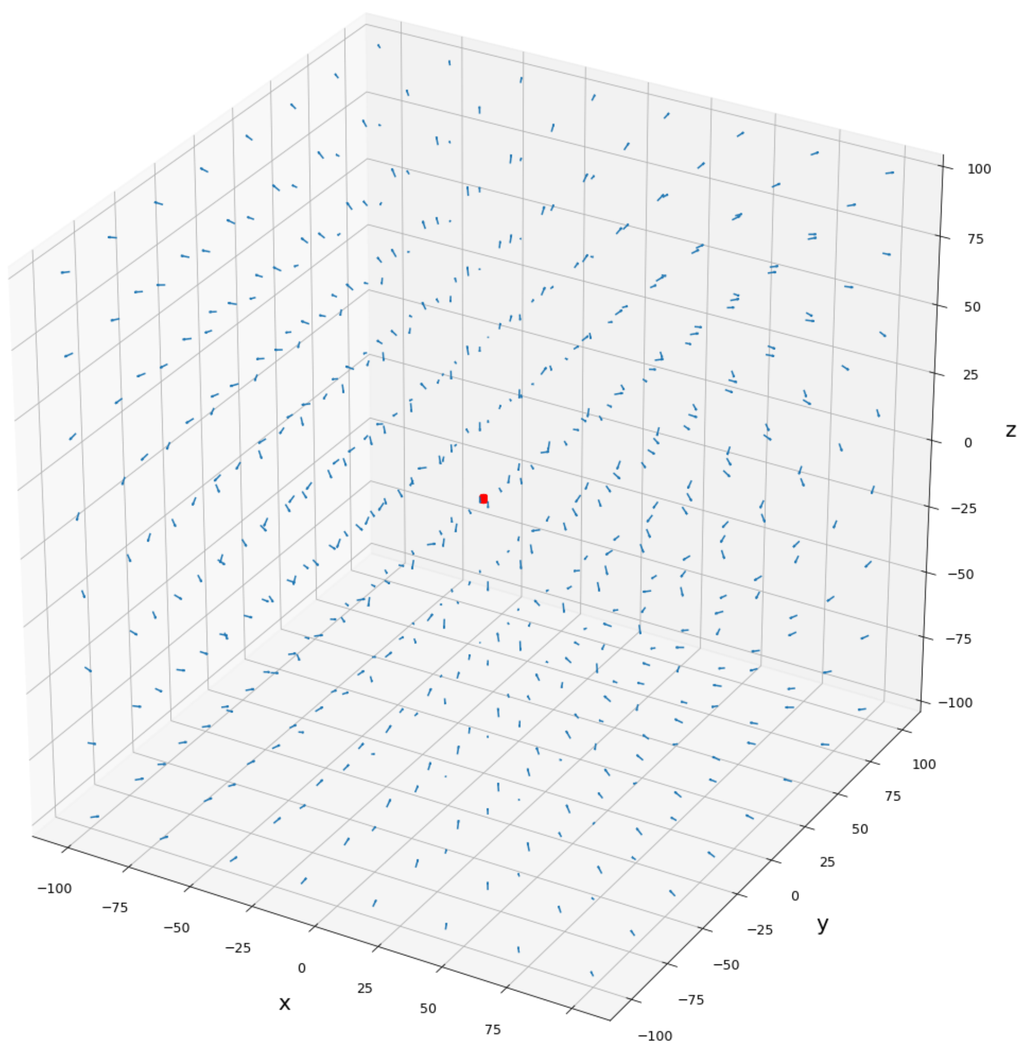
In [ ]:
```
cyl_rad=1
cyl_len=2

total=8
l_lim=-100
u_lim=100
x=np.linspace(l_lim,u_lim,total)
y=deepcopy(x)
z=deepcopy(x)
x,y,z=np.meshgrid(x,y,z)

# Functions to calculate the integrands in the three directions
def x_integrand(phi_prime,z_prime,x,y,z):
  R=np.linalg.norm([x-cyl_rad*np.cos(phi_prime),y-cyl_rad*np.sin(phi_prime),z-z_prime])
  return cyl_rad*np.cos(phi_prime)*(z-z_prime)/R**3

def y_integrand(phi_prime,z_prime,x,y,z):
  R=np.linalg.norm([x-cyl_rad*np.cos(phi_prime),y-cyl_rad*np.sin(phi_prime),z-z_prime])
  return cyl_rad*np.sin(phi_prime)*(z-z_prime)/R**3

def z_integrand(phi_prime,z_prime,x,y,z):
  R=np.linalg.norm([x-cyl_rad*np.cos(phi_prime),y-cyl_rad*np.sin(phi_prime),z-z_prime])
  return (cyl_rad*np.sin(phi_prime)*(y-cyl_rad*np.sin(phi_prime))+cyl_rad*np.cos(phi_prime)*(x-cyl_rad*np.cos(phi_prime)))/R**3


# Function to calculate magnetic field
def magnetic_field(x,y,z):
  M=1e6
  mu0_4pi=mu_0/(4*np.pi)
  print(mu0_4pi)
  cons=M*mu0_4pi
  x=x.reshape(-1)
  y=y.reshape(-1)
  z=z.reshape(-1)
  mag_x=[]
  mag_y=[]
  mag_z=[]


  for i in range(0,len(x)):
    mag_x.append(cons*dblquad(x_integrand,-cyl_len/2,cyl_len/2,lambda inner:0,lambda inner:2*np.pi,args=(x[i],y[i],z[i]))[0])
    mag_y.append(cons*dblquad(y_integrand,-cyl_len/2,cyl_len/2,lambda inner:0,lambda inner:2*np.pi,args=(x[i],y[i],z[i]))[0])
    mag_z.append(-cons*dblquad(z_integrand,-cyl_len/2,cyl_len/2,lambda inner:0,lambda inner:2*np.pi,args=(x[i],y[i],z[i]))[0])

  mag_x=np.array(mag_x).reshape(total,total,total)
  mag_y=np.array(mag_y).reshape(total,total,total)
  mag_z=np.array(mag_z).reshape(total,total,total)

  return mag_x,mag_y,mag_z
```

```
Bx,By,Bz=magnetic_field(x,y,z)
```

```
1.0000000000000001e-07
```

In [ ]:
```
def cylinder(cyl_rad):
    phi = np.linspace(0,2*np.pi,100)
    return cyl_rad*np.cos(phi),cyl_rad*np.sin(phi)

fig=plt.figure(figsize=(20,20))
ax=fig.gca(projection='3d')
c_x,c_y=cylinder(cyl_rad)
for i in np.linspace(-int(cyl_len/2),int(cyl_len/2),100):
  ax.plot(c_x,c_y,i,color='r')
ax.set_xlabel('x',fontsize=20,labelpad=30)
ax.set_ylabel('y',fontsize=20,labelpad=30)
ax.set_zlabel('z',fontsize=20,labelpad=30)
ax.tick_params(labelsize=12.5,pad=15)
color=np.linalg.norm([Bx,By,Bz])
ax.quiver(x,y,z,Bx,By,Bz,length=3,normalize=True,label='Magnetic Field of a Cy
lindrical Magnet')
```

Out[ ]: <mpl_toolkits.mplot3d.art3d.Line3DCollection at 0x7fcb62f58250>



H5: Figure out how numbers are mapped to colors. How are the lowest and highest numeric values allocated the extremities of the colormaps?

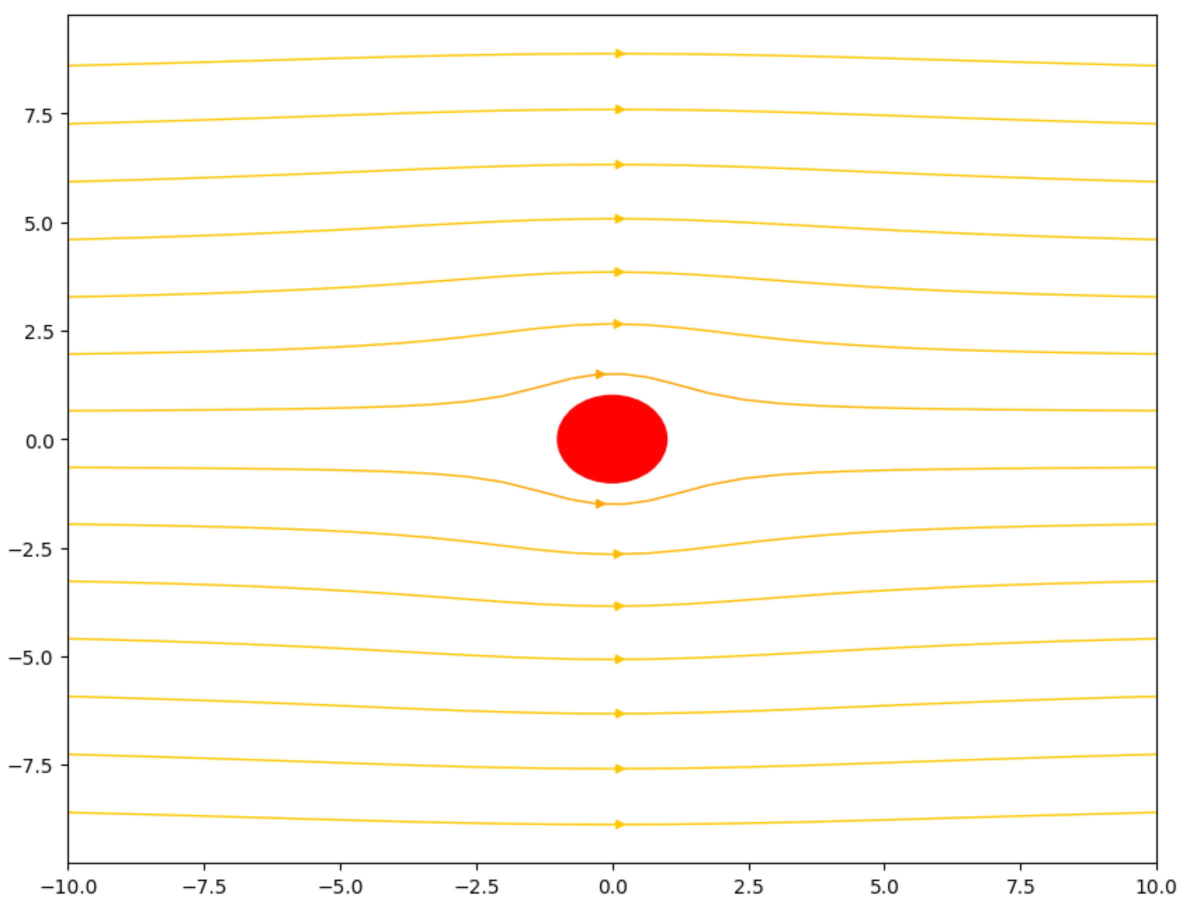
Flow Past a Sphere at Low Reynolds Numbers

Theory:
https://geo.libretexts.org/Bookshelves/Sedimentology/Book%3A_Introduction_to_Fluid_Motions_and_Sediment_Tr
_Stokes'_Law%2C_The_Bernoulli_Equation%2C_Turbulence%2C_Boundary_Layers%2C_Flow_Separation/3.02%
(https://geo.libretexts.org/Bookshelves/Sedimentology/Book%3A_Introduction_to_Fluid_Motions_and_Sediment_T
_Stokes'_Law%2C_The_Bernoulli_Equation%2C_Turbulence%2C_Boundary_Layers%2C_Flow_Separation/3.02%
Check equation 3.2.1

In [ ]:

```
x=np.linspace(-10,10,100)
y=np.linspace(-10,10,100)
xg,yg=np.meshgrid(x,y)
rad=1
vel=1
def velocity(x,y,R,U):
  r=np.sqrt(x**2+y**2)
  cos_th=x/r
  sin_th=y/r
  u_r=U*cos_th*(1-3*R/(2*r)+R**3/(2*r**3))
  u_theta=-U*sin_th*(1-3*R/(4*r)-R**3/(4*r**3))
  u_x=u_r*cos_th-u_theta*sin_th
  u_y=u_r*sin_th+u_theta*cos_th
  return u_x,u_y

ux,uy=velocity(xg,yg,rad,vel)

color=np.log((np.sqrt(ux**2+uy**2)))
y_aux=np.linspace(-10,10,16)
x_aux=[-8]*len(y_aux)
figure, ax = plt.subplots(figsize=(10,8),dpi=100)
ax.streamplot(xg, yg, ux, uy, color=color,linewidth=1,cmap='hot',density=1, ar
rowstyle='-|>', arrowsize=1,minlength=0.4,start_points=np.array([x_aux,y_aux])
.T)
ax.add_artist(Circle((0,0),1,color='red'))
```

Out[ ]: <matplotlib.patches.Circle at 0x7fcb633033d0>



In [281]:
```
!jupyter nbconvert --execute --to html Plots.ipynb
```

```
[NbConvertApp] WARNING | pattern u'Plots:' matched no files
[NbConvertApp] WARNING | pattern u'Singularities,Lissajous' matched no files
[NbConvertApp] WARNING | pattern u'Figures,' matched no files
[NbConvertApp] WARNING | pattern u'Spirals,' matched no files
[NbConvertApp] WARNING | pattern u'Fields.ipynb' matched no files
This application is used to convert notebook files (*.ipynb) to various other
formats.

WARNING: THE COMMANDLINE INTERFACE MAY CHANGE IN FUTURE RELEASES.

Options
-------

Arguments that take values are actually convenience aliases to full
Configurables, whose aliases are listed on the help line. For more informatio
n
on full configurables, see '--help-all'.

--execute
    Execute the notebook prior to export.
--allow-errors
    Continue notebook execution even if one of the cells throws an error and
include the error message in the cell output (the default behaviour is to abo
rt conversion). This flag is only relevant if '--execute' was specified, too.
--no-input
    Exclude input cells and output prompts from converted document.
    This mode is ideal for generating code-free reports.
--stdout
    Write notebook output to stdout instead of files.
--stdin
    read a single notebook file from stdin. Write the resulting notebook with
default basename 'notebook.*'
--inplace
    Run nbconvert in place, overwriting the existing notebook (only
    relevant when converting to notebook format)
-y
    Answer yes to any questions instead of prompting.
--clear-output
    Clear output of current file and save in place,
    overwriting the existing notebook.
--debug
    set log level to logging.DEBUG (maximize logging output)
--no-prompt
    Exclude input and output prompts from converted document.
--generate-config
    generate default config file
--nbformat=<Enum> (NotebookExporter.nbformat_version)
    Default: 4
    Choices: [1, 2, 3, 4]
    The nbformat version to write. Use this to downgrade notebooks.
--output-dir=<Unicode> (FilesWriter.build_directory)
    Default: ''
    Directory to write output(s) to. Defaults to output to the directory of e
ach
    notebook. To recover previous default behaviour (outputting to the curren
t
    working directory) use . as the flag value.
```

```
--writer=<DottedObjectName> (NbConvertApp.writer_class)
    Default: 'FilesWriter'
    Writer class used to write the  results of the conversion
--log-level=<Enum> (Application.log_level)
    Default: 30
    Choices: (0, 10, 20, 30, 40, 50, 'DEBUG', 'INFO', 'WARN', 'ERROR', 'CRITI
CAL')
    Set the log level by value or name.
--reveal-prefix=<Unicode> (SlidesExporter.reveal_url_prefix)
    Default: u''
    The URL prefix for reveal.js (version 3.x). This defaults to the reveal C
DN,
    but can be any url pointing to a copy  of reveal.js.
    For speaker notes to work, this must be a relative path to a local  copy
of
    reveal.js: e.g., "reveal.js".
    If a relative path is given, it must be a subdirectory of the current
    directory (from which the server is run).
    See the usage documentation
    (https://nbconvert.readthedocs.io/en/latest/usage.html#reveal-js-html-
    slideshow) for more details.
--to=<Unicode> (NbConvertApp.export_format)
    Default: 'html'
    The export format to be used, either one of the built-in formats
    ['asciidoc', 'custom', 'html', 'latex', 'markdown', 'notebook', 'pdf',
    'python', 'rst', 'script', 'slides'] or a dotted object name that represe
nts
    the import path for an `Exporter` class
--template=<Unicode> (TemplateExporter.template_file)
    Default: u''
    Name of the template file to use
--output=<Unicode> (NbConvertApp.output_base)
    Default: ''
    overwrite base name use for output files. can only be used when convertin
g
    one notebook at a time.
--post=<DottedOrNone> (NbConvertApp.postprocessor_class)
    Default: u''
    PostProcessor class used to write the results of the conversion
--config=<Unicode> (JupyterApp.config_file)
    Default: u''
    Full path of a config file.

To see all available configurables, use `--help-all`

Examples
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    The simplest way to use nbconvert is

    > jupyter nbconvert mynotebook.ipynb

    which will convert mynotebook.ipynb to the default format (probably HTM
L).

    You can specify the export format with `--to`.
    Options include ['asciidoc', 'custom', 'html', 'latex', 'markdown', 'note
```

```
book', 'pdf', 'python', 'rst', 'script', 'slides'].

    > jupyter nbconvert --to latex mynotebook.ipynb

    Both HTML and LaTeX support multiple output templates. LaTeX includes
    'base', 'article' and 'report'.  HTML includes 'basic' and 'full'. You
    can specify the flavor of the format used.

    > jupyter nbconvert --to html --template basic mynotebook.ipynb

    You can also pipe the output to stdout, rather than a file

    > jupyter nbconvert mynotebook.ipynb --stdout

    PDF is generated via latex

    > jupyter nbconvert mynotebook.ipynb --to pdf

    You can get (and serve) a Reveal.js-powered slideshow

    > jupyter nbconvert myslides.ipynb --to slides --post serve

    Multiple notebooks can be given at the command line in a couple of
    different ways:

    > jupyter nbconvert notebook*.ipynb
    > jupyter nbconvert notebook1.ipynb notebook2.ipynb

    or you can specify the notebooks list in a config file, containing::

        c.NbConvertApp.notebooks = ["my_notebook.ipynb"]

    > jupyter nbconvert --config mycfg.py
```

In [ ]: