测试文档

standard normal distribution (mean = 0, standard deviation = 1)

```
stdnormal_rnd(1,5)
#> ans =
#>
#>    -0.308048  -0.857498   1.519004  -0.676947   0.090308
```

$\mu = 2, \sigma = 4$ standard deviation sigma

```
%% copy from https://stackoverflow.com/questions/13735096/python-vs-octave-random-generator
function state = mtstate(seed)
state = uint32(zeros(625,1));
state(1) = uint32(seed);
for i=1:623,
   tmp = uint64(1812433253)*uint64(bitxor(state(i),bitshift(state(i),-30)))+i;
   state(i+1) = uint32(bitand(tmp,uint64(intmax('uint32'))));
end
state(625) = 1;
end

rand('state',mtstate(4));
rand(1,5)
rand('state',mtstate(4));
rand(1,5)
#> ans =
#>
#>    0.96703   0.54723   0.97268   0.71482   0.69773
#>
#> ans =
#>
#>    0.96703   0.54723   0.97268   0.71482   0.69773
```

```
help('modules')
#>
#> Please wait a moment while I gather a list of all available modules...
#>
#> DEBUG:pip.utils:lzma module is not available
#> DEBUG:pip.vcs:Registered VCS backend: git
```

```
#> DEBUG:pip.vcs:Registered VCS backend: hg
#> DEBUG:pip.vcs:Registered VCS backend: svn
#> DEBUG:pip.vcs:Registered VCS backend: bzr
#> BaseHTTPServer      ast                 imaplib             select
#> Bastion             asynchat            imghdr              sets
#> CDROM               asyncore            imp                 setuptools
#> CGIHTTPServer       atexit              importlib           sgmllib
#> Canvas              audiodev            imputil             sha
#> ConfigParser        audioop             inspect             shelve
#> Cookie              base64              io                  shlex
#> Crypto              bdb                 ipaddress           shutil
#> DLFCN               binascii            itertools           signal
#> Dialog              binhex              json                signatures
#> DocXMLRPCServer     bisect              keyring             site
#> FileDialog          bsddb               keyrings            sitecustomize
#> FixTk               bz2                 keyword             six
#> HTMLParser          cPickle             lib2to3             smtpd
#> IN                  cProfile            linecache           smtplib
#> MimeWriter          cStringIO           linuxaudiodev       sndhdr
#> Queue               cachecontrol        locale              socket
#> ScrolledText        caches              lockfile            spwd
#> SimpleDialog        calendar            logging             sqlite3
#> SimpleHTTPServer    cgi                 lsb_release         sre
#> SimpleXMLRPCServer  cgitb               macpath             sre_compile
#> SocketServer        chunk               macurl2path         sre_constants
#> StringIO            cmath               mailbox             sre_parse
#> TYPES               cmd                 mailcap             ssl
#> Tix                 code                markupbase          stat
#> Tkconstants         codecs              marshal             statvfs
#> Tkdnd               codeop              math                string
#> Tkinter             collections         md5                 stringold
#> UserDict            colorsys            mhlib               stringprep
#> UserList            command             mimetools           strop
#> UserString          commands            mimetypes           struct
#> _LWPCookieJar       compileall          mimify              subprocess
#> _MozillaCookieJar   compiler            mmap                sunau
#> __builtin__         contextlib          modulefinder        sunaudio
#> __future__          contrib             multifile           symbol
#> _abcoll             cookielib           multiprocessing     symtable
```

```
#> _ast                  copy                  mutex                 sys
#> _backport             copy_reg              netrc                 sysconfig
#> _bisect               crypt                 new                   syslog
#> _bsddb                cryptography          nis                   tabnanny
#> _cffi_backend         csv                   nntplib               talloc
#> _codecs               ctypes                ntpath                tarfile
#> _codecs_cn            curses                nturl2path            telnetlib
#> _codecs_hk            datetime              numbers               tempfile
#> _codecs_iso2022       dbhash                numpy                 termios
#> _codecs_jp            dbm                   opcode                test
#> _codecs_kr            dbus                  operator              textwrap
#> _codecs_tw            debconf               optparse              this
#> _collections          decimal               os                    thread
#> _csv                  difflib               os2emxpath            threading
#> _ctypes               dircache              ossaudiodev           time
#> _ctypes_test          dis                   packages              timeit
#> _curses               distlib               packaging             tkColorChooser
#> _curses_panel         distutils             parser                tkCommonDialog
#> _dbus_bindings        doctest               pdb                   tkFileDialog
#> _dbus_glib_bindings   dumbdbm               pickle                tkFont
#> _elementtree          dummy_thread          pickletools           tkMessageBox
#> _functools            dummy_threading       pip                   tkSimpleDialog
#> _hashlib              easy_install          pipes                 toaiff
#> _heapq                email                 pkg_resources         token
#> _hotshot              encodings             pkgutil               tokenize
#> _io                   ensurepip             platform              tool
#> _json                 enum                  plistlib              trace
#> _locale               errno                 popen2                traceback
#> _lsprof               exceptions            poplib                ttk
#> _md5                  extern                posix                 tty
#> _multibytecodec       fcntl                 posixfile             turtle
#> _multiprocessing      filecmp               posixpath             types
#> _osx_support          fileinput             pprint                unicodedata
#> _pyio                 fnmatch               profile               unittest
#> _random               formatter             pstats                urllib
#> _sha                  fpectl                pty                   urllib2
#> _sha256               fpformat              pwd                   urllib3
#> _sha512               fractions             py_compile            urlparse
#> _socket               ftplib                pyasn1                user
```

```
#> _sqlite3            functools           pyclbr              util
#> _sre                future_builtins     pydoc               uu
#> _ssl                gc                  pydoc_data          uuid
#> _strptime           genericpath         pyexpat             warnings
#> _struct             getopt              pygtkcompat         wave
#> _symtable           getpass             quopri              weakref
#> _sysconfigdata      gettext             random              webbrowser
#> _sysconfigdata_nd   gi                  re                  wheel
#> _testcapi           glob                readline            whichdb
#> _threading_local    grp                 repr                wsgiref
#> _warnings           gzip                resource            xdg
#> _weakref            hashlib             retrying            xdrlib
#> _weakrefset         heapq               rexec               xml
#> abc                 hmac                rfc822              xmllib
#> aifc                hotshot             rlcompleter         xmlrpclib
#> antigravity         htmlentitydefs      robotparser         xxsubtype
#> anydbm              htmllib             rpytools            zipfile
#> appdirs             httplib             runpy               zipimport
#> argparse            idna                sched               zlib
#> array               ihooks              secretstorage
#>
#> Enter any module name to get more help.  Or, type "modules spam" to search
#> for modules whose descriptions contain the word "spam".
```

```
library(extrafont)
library(xkcd)
ggplot(aes(mpg, wt), data = mtcars) + geom_point() +
    theme_xkcd()
```

```
x <- rnorm(10)
y <- x + rnorm(5, sd = 0.25)
model <- lm(y ~ x)
rsq <- summary(model)$r.squared
rsq <- signif(rsq, 4)
plot(x, y, main = "Hello \\LaTeX!", xlab = "$x$", ylab = "$y$",
     sub = "$\\mathcal{N}(\\mathbf{x};\\mu,\\Sigma)$")
abline(model, col = "red")
mtext(paste("Linear model: $R^{2}=", rsq, "$"), line = 0.5)
legend("bottomright", legend = paste0("$y = ",
                                      round(coef(model)[2], 3),
```

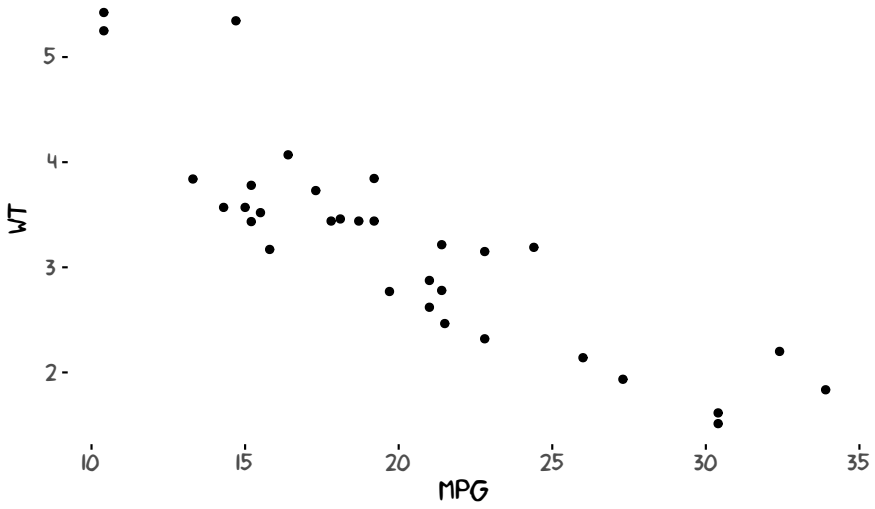
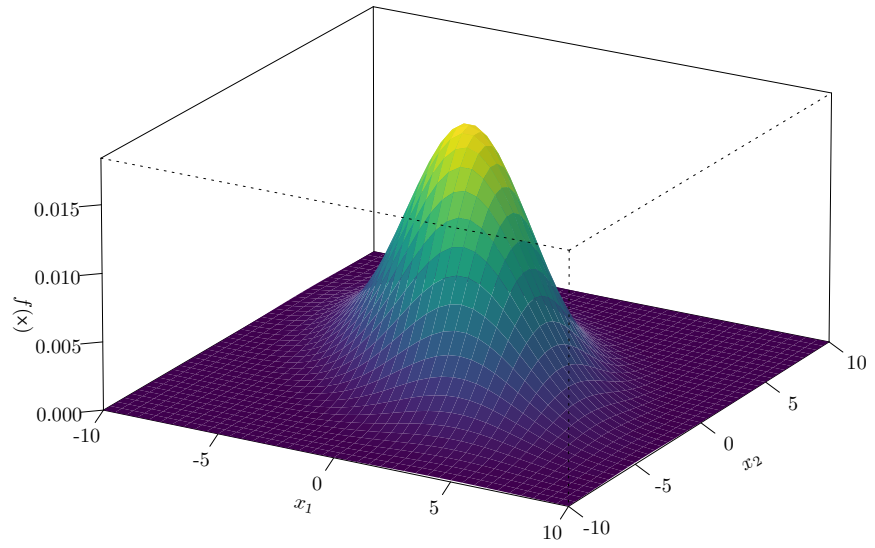


图 1: xkcd

Two dimensional Normal Distribution

$\mu_1 = 0, \mu_2 = 0, \sigma_{11} = 10, \sigma_{22} = 10, \sigma_{12} = 15, \rho = 0.5$



$$f(\mathrm{x}) = \frac{1}{2\pi\sqrt{\sigma_{11}\sigma_{22}(1-\rho^2)}} \exp\left\{ -\frac{1}{2(1-\rho^2)}\left[\frac{(x_1-\mu_1)^2}{\sigma_{11}} - 2\rho\frac{(x_1-\mu_1)(x_2-\mu_2)}{\sqrt{\sigma_{11}}\sqrt{\sigma_{22}}} + \frac{(x_2-\mu_2)^2}{\sigma_{22}}\right]\right\}$$

图 2: tikz

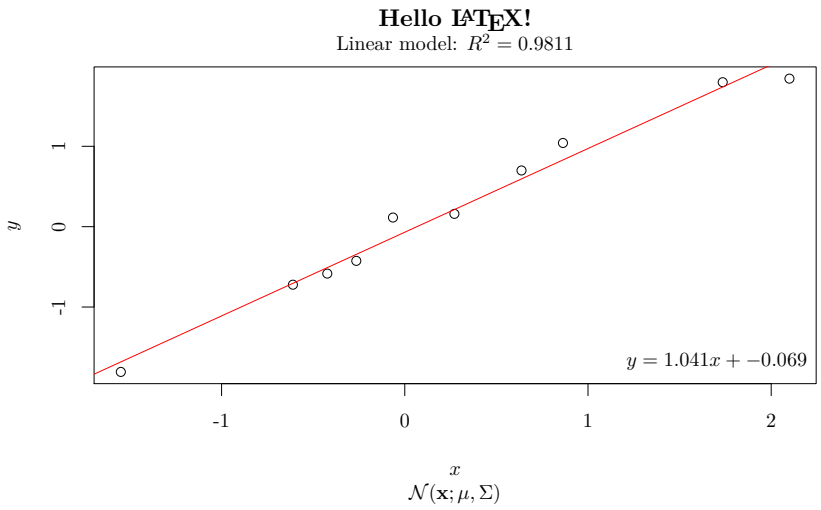


图 3: Linear

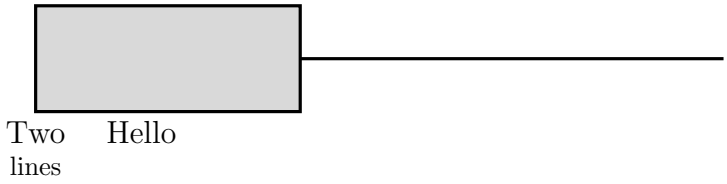


图 4: tikz

```
                                    "x +",
                                    round(coef(model)[1], 3),
                                    "$"
                                    ),
       bty = "n")
```

```
\begin{tikzpicture}[scale=.7]
\draw [fill=gray!30,very thick] (0,-1) rectangle (5,1);
\draw [very thick] (5, 0) -- (13,0);
\node [below] at (2,-1) {\large Hello};
\node [below, align=center] at (0,-1) {\large Two\\ lines};
\end{tikzpicture}
```