02-Environment-and-Libraries

November 21, 2019

1 Simple string processing

```
In [35]: type("abc")

Out[35]: str

In [5]:     a="onur tolg sehitoglu"
        a.split(" ")

Out[5]: ['onur', 'tolg', 'sehitoglu']

In [40]: "".join(["a","b","c"])

Out[40]: 'abc'

In [6]: print(a)
        print(a.find("sehit"))
        print(a.find("nothing"))   # returns -1
        print(a.rindex("o"), a.index("o"))    # right to left search
        try:
            print(a.index("nothing"))
        except ValueError as v:
            print(v)
        print(a.upper())
        a[2:8]                     # substring

onur tolg sehitoglu
10
-1
15 0
substring not found
ONUR TOLG SEHITOGLU


Out[6]: 'ur tol'
```

2 Formatted strings

- old format: % operator, `format % (args)`
- new format: `formatstring.format(args)`

```
In [3]: "%d %-10d %5.2f %20s" % (3,4,1.5,"onur")

Out[3]: '3 4          1.50                 onur'

In [50]: print("{} {} {}".format(3,4,"onur"))
         print("{2} {1} {0}".format(3,4,"onur"))

3 4 onur
onur 4 3


In [5]: "{0:5d} {1:5.2f} {2:20s} {surname} {name}".format(3,4,"onur",
                                   name="cin",surname="ali")

Out[5]: '    3  4.00 onur                 ali cin'
```

3 Array map and filter

- `filter(f,iteratable)` returns an iterator giving only elements i returning True for f(i)
- `map(f, iteratable)` returns an iterator giving f(i) for all elements
- `[f(i) for i in iteratable]` also works similar to `map`
- `[f(i) for i in iteratable if g(i)]` is general form

```
In [54]: list(filter(lambda x:x<5, [1,2,3,4,5,6,7]))

Out[54]: [1, 2, 3, 4]

In [2]: list(map(lambda x:x*x, [1,2,3,4,5,6,7]))

Out[2]: [1, 4, 9, 16, 25, 36, 49]

In [4]: ":".join(map(str, [1,2,3,4,5,6,7]))

Out[4]: '1:2:3:4:5:6:7'

In [5]: ":".join(map(str, filter(lambda x: x % 2 == 0,[1,2,3,4,5,6,7])))

Out[5]: '2:4:6'

In [9]: a=[2,3,5,7,11,13,17]
        print([i*i for i in a])
        print([i*i for i in a if i < 5])
        print([i*j for i in a for j in a])

[4, 9, 25, 49, 121, 169, 289]
[4, 9]
[4, 6, 10, 14, 22, 26, 34, 6, 9, 15, 21, 33, 39, 51, 10, 15, 25, 35, 55, 65, 85, 14, 21, 35, 49,
```

4 File and I/O

- `fp = open(path,"rw")` returns a file handle
- `fp.readline()` read a line
- `fp.read(n)` read n bytes
- `fp.read()` whole read
- `fp.seek(n)` seek to a position in file
- `fp.close()` close file
- file handle is also an iterator, `next()` reads next line

```
In [6]: input1=input()

32132141


In [7]: input1

Out[7]: '32132141'

In [8]: fp=open("/etc/services","r")

In [9]: for line in fp:
            print(line,end='')
        fp.readline()

# Network services, Internet style
#
# Note that it is presently the policy of IANA to assign a single well-known
# port number for both TCP and UDP; hence, officially ports have two entries
# even if the protocol doesn't support UDP operations.
#
# Updated from http://www.iana.org/assignments/port-numbers and other
# sources like http://www.freebsd.org/cgi/cvsweb.cgi/src/etc/services .
# New ports will be added on request if they have been officially assigned
# by IANA and used in the real-world or are needed by a debian package.
# If you need a huge list of used numbers please install the nmap package.

tcpmux              1/tcp                                   # TCP port service multiplexer
echo                7/tcp
echo                7/udp
discard             9/tcp                   sink null
discard             9/udp                   sink null
systat             11/tcp                   users
daytime            13/tcp
daytime            13/udp
netstat            15/tcp
qotd               17/tcp                   quote
msp                18/tcp                                   # message send protocol
msp                18/udp
```

```
chargen                 19/tcp          ttytst source
chargen                 19/udp          ttytst source
ftp-data        20/tcp
ftp             21/tcp
fsp             21/udp          fspd
ssh             22/tcp                          # SSH Remote Login Protocol
telnet          23/tcp
smtp            25/tcp          mail
time            37/tcp          timserver
time            37/udp          timserver
rlp             39/udp          resource        # resource location
nameserver      42/tcp          name            # IEN 116
whois           43/tcp          nicname
tacacs          49/tcp                          # Login Host Protocol (TACACS)
tacacs          49/udp
re-mail-ck      50/tcp                          # Remote Mail Checking Protocol
re-mail-ck      50/udp
domain          53/tcp                          # Domain Name Server
domain          53/udp
tacacs-ds       65/tcp                          # TACACS-Database Service
tacacs-ds       65/udp
bootps          67/tcp                          # BOOTP server
bootps          67/udp
bootpc          68/tcp                          # BOOTP client
bootpc          68/udp
tftp            69/udp
gopher          70/tcp                          # Internet Gopher
finger          79/tcp
http            80/tcp          www             # WorldWideWeb HTTP
link            87/tcp          ttylink
kerberos        88/tcp          kerberos5 krb5 kerberos-sec     # Kerberos v5
kerberos        88/udp          kerberos5 krb5 kerberos-sec     # Kerberos v5
supdup          95/tcp
hostnames       101/tcp         hostname        # usually from sri-nic
iso-tsap        102/tcp         tsap            # part of ISODE
acr-nema        104/tcp         dicom           # Digital Imag. & Comm. 300
acr-nema        104/udp         dicom
csnet-ns        105/tcp         cso-ns          # also used by CSO name server
csnet-ns        105/udp         cso-ns
rtelnet         107/tcp                         # Remote Telnet
rtelnet         107/udp
pop3            110/tcp         pop-3           # POP version 3
sunrpc          111/tcp         portmapper      # RPC 4.0 portmapper
sunrpc          111/udp         portmapper
auth            113/tcp         authentication tap ident
sftp            115/tcp
nntp            119/tcp         readnews untp   # USENET News Transfer Protocol
ntp             123/tcp
```

```
ntp                     123/udp                                         # Network Time Protocol
pwdgen                  129/tcp                                          # PWDGEN service
pwdgen                  129/udp
loc-srv                 135/tcp                     epmap                    # Location Service
loc-srv                 135/udp                     epmap
netbios-ns          137/tcp                                         # NETBIOS Name Service
netbios-ns          137/udp
netbios-dgm         138/tcp                                         # NETBIOS Datagram Service
netbios-dgm         138/udp
netbios-ssn         139/tcp                                         # NETBIOS session service
netbios-ssn         139/udp
imap2                   143/tcp                     imap                # Interim Mail Access P 2 and 4
snmp                    161/tcp                                     # Simple Net Mgmt Protocol
snmp                    161/udp
snmp-trap           162/tcp                     snmptrap        # Traps for SNMP
snmp-trap           162/udp                     snmptrap
cmip-man            163/tcp                                         # ISO mgmt over IP (CMOT)
cmip-man            163/udp
cmip-agent          164/tcp
cmip-agent          164/udp
mailq                   174/tcp                                     # Mailer transport queue for Zmailer
mailq                   174/udp
xdmcp                   177/tcp                                     # X Display Mgr. Control Proto
xdmcp                   177/udp
nextstep            178/tcp                 NeXTStep NextStep       # NeXTStep window
nextstep            178/udp                 NeXTStep NextStep       #   server
bgp                     179/tcp                                     # Border Gateway Protocol
irc                     194/tcp                                     # Internet Relay Chat
irc                     194/udp
smux                    199/tcp                                     # SNMP Unix Multiplexer
smux                    199/udp
at-rtmp                 201/tcp                                          # AppleTalk routing
at-rtmp                 201/udp
at-nbp                  202/tcp                                          # AppleTalk name binding
at-nbp                  202/udp
at-echo                 204/tcp                                          # AppleTalk echo
at-echo                 204/udp
at-zis                  206/tcp                                          # AppleTalk zone information
at-zis                  206/udp
qmtp                    209/tcp                                          # Quick Mail Transfer Protocol
qmtp                    209/udp
z3950                   210/tcp                     wais                # NISO Z39.50 database
z3950                   210/udp                     wais
ipx                 213/tcp                                     # IPX
ipx                 213/udp
pawserv                 345/tcp                                          # Perf Analysis Workbench
pawserv                 345/udp
zserv                   346/tcp                                          # Zebra server
```

```
zserv                   346/udp
fatserv                 347/tcp                                       # Fatmen Server
fatserv                 347/udp
rpc2portmap         369/tcp
rpc2portmap         369/udp                                   # Coda portmapper
codaauth2         370/tcp
codaauth2         370/udp                                   # Coda authentication server
clearcase         371/tcp             Clearcase
clearcase         371/udp             Clearcase
ulistserv         372/tcp                           # UNIX Listserv
ulistserv         372/udp
ldap                389/tcp                       # Lightweight Directory Access Protocol
ldap                389/udp
imsp                406/tcp                       # Interactive Mail Support Protocol
imsp                406/udp
svrloc                427/tcp                           # Server Location
svrloc                427/udp
https                 443/tcp                           # http protocol over TLS/SSL
snpp                444/tcp                           # Simple Network Paging Protocol
snpp                444/udp
microsoft-ds         445/tcp                           # Microsoft Naked CIFS
microsoft-ds         445/udp
kpasswd               464/tcp
kpasswd               464/udp
urd                 465/tcp                 ssmtp smtps  # URL Rendesvous Directory for SSM
saft                487/tcp                         # Simple Asynchronous File Transfer
saft                487/udp
isakmp                500/tcp                       # IPsec - Internet Security Association
isakmp                500/udp                       #  and Key Management Protocol
rtsp                554/tcp                     # Real Time Stream Control Protocol
rtsp                554/udp
nqs                 607/tcp                           # Network Queuing system
nqs                 607/udp
npmp-local         610/tcp             dqs313_qmaster                   # npmp-local / DQS
npmp-local         610/udp             dqs313_qmaster
npmp-gui           611/tcp           dqs313_execd                   # npmp-gui / DQS
npmp-gui           611/udp           dqs313_execd
hmmp-ind           612/tcp           dqs313_intercell         # HMMP Indication / DQS
hmmp-ind           612/udp           dqs313_intercell
asf-rmcp           623/udp           # ASF Remote Management and Control Protocol
qmqp                628/tcp
qmqp                628/udp
ipp                 631/tcp                           # Internet Printing Protocol
ipp                 631/udp
#
# UNIX specific services
#
exec                512/tcp
```

```
biff            512/udp         comsat
login           513/tcp
who             513/udp     whod
shell           514/tcp      cmd                     # no passwords used
syslog          514/udp
printer          515/tcp         spooler                  # line printer spooler
talk            517/udp
ntalk           518/udp
route           520/udp     router routed        # RIP
timed           525/udp     timeserver
tempo           526/tcp     newdate
courier          530/tcp      rpc
conference     531/tcp     chat
netnews          532/tcp         readnews
netwall          533/udp                          # for emergency broadcasts
gdomap          538/tcp                            # GNUstep distributed objects
gdomap          538/udp
uucp            540/tcp      uucpd                    # uucp daemon
klogin          543/tcp                          # Kerberized `rlogin' (v5)
kshell          544/tcp        krcmd                # Kerberized `rsh' (v5)
dhcpv6-client   546/tcp
dhcpv6-client   546/udp
dhcpv6-server   547/tcp
dhcpv6-server   547/udp
afpovertcp      548/tcp                           # AFP over TCP
afpovertcp      548/udp
idfp            549/tcp
idfp            549/udp
remotefs       556/tcp      rfs_server rfs        # Brunhoff remote filesystem
nntps           563/tcp       snntp                  # NNTP over SSL
submission      587/tcp                           # Submission [RFC4409]
ldaps           636/tcp                            # LDAP over SSL
ldaps           636/udp
tinc            655/tcp                            # tinc control port
tinc            655/udp
silc            706/tcp
silc            706/udp
kerberos-adm    749/tcp                            # Kerberos `kadmin' (v5)
#
webster          765/tcp                            # Network dictionary
webster          765/udp
rsync           873/tcp
ftps-data       989/tcp                           # FTP over SSL (data)
ftps            990/tcp
telnets          992/tcp                            # Telnet over SSL
imaps           993/tcp                           # IMAP over SSL
pop3s           995/tcp                           # POP-3 over SSL
#
```

```
# From ``Assigned Numbers'':
#
#> The Registered Ports are not controlled by the IANA and on most systems
#> can be used by ordinary user processes or programs executed by ordinary
#> users.
#
#> Ports are used in the TCP [45,106] to name the ends of logical
#> connections which carry long term conversations.  For the purpose of
#> providing services to unknown callers, a service contact port is
#> defined.  This list specifies the port used by the server process as its
#> contact port.  While the IANA can not control uses of these ports it
#> does register or list uses of these ports as a convienence to the
#> community.
#
socks               1080/tcp                         # socks proxy server
socks               1080/udp
proofd               1093/tcp
proofd               1093/udp
rootd               1094/tcp
rootd               1094/udp
openvpn              1194/tcp
openvpn              1194/udp
rmiregistry         1099/tcp                         # Java RMI Registry
rmiregistry         1099/udp
kazaa               1214/tcp
kazaa               1214/udp
nessus               1241/tcp                        # Nessus vulnerability
nessus               1241/udp                        #  assessment scanner
lotusnote           1352/tcp        lotusnotes       # Lotus Note
lotusnote           1352/udp        lotusnotes
ms-sql-s            1433/tcp                        # Microsoft SQL Server
ms-sql-s            1433/udp
ms-sql-m            1434/tcp                        # Microsoft SQL Monitor
ms-sql-m            1434/udp
ingreslock           1524/tcp
ingreslock           1524/udp
datametrics          1645/tcp        old-radius
datametrics          1645/udp        old-radius
sa-msg-port          1646/tcp        old-radacct
sa-msg-port          1646/udp        old-radacct
kermit               1649/tcp
kermit               1649/udp
groupwise           1677/tcp
groupwise           1677/udp
l2f                 1701/tcp        l2tp
l2f                 1701/udp        l2tp
radius               1812/tcp
radius               1812/udp
```

```
radius-acct        1813/tcp      radacct                # Radius Accounting
radius-acct        1813/udp      radacct
msnp               1863/tcp                                # MSN Messenger
msnp               1863/udp
unix-status        1957/tcp                                 # remstats unix-status server
log-server         1958/tcp                              # remstats log server
remoteping         1959/tcp                              # remstats remoteping server
cisco-sccp         2000/tcp                              # Cisco SCCP
cisco-sccp         2000/udp
search             2010/tcp         ndtp
pipe-server        2010/tcp         pipe_server
nfs                2049/tcp                              # Network File System
nfs                2049/udp                              # Network File System
gnunet             2086/tcp
gnunet             2086/udp
rtcm-sc104         2101/tcp                              # RTCM SC-104 IANA 1/29/99
rtcm-sc104         2101/udp
gsigatekeeper      2119/tcp
gsigatekeeper      2119/udp
gris               2135/tcp                    # Grid Resource Information Server
gris               2135/udp
cvspserver         2401/tcp                           # CVS client/server operations
cvspserver         2401/udp
venus              2430/tcp                              # codacon port
venus              2430/udp                              # Venus callback/wbc interface
venus-se           2431/tcp                        # tcp side effects
venus-se           2431/udp                        # udp sftp side effect
codasrv            2432/tcp                              # not used
codasrv            2432/udp                              # server port
codasrv-se         2433/tcp                       # tcp side effects
codasrv-se         2433/udp                       # udp sftp side effect
mon                2583/tcp                             # MON traps
mon                2583/udp
dict               2628/tcp                              # Dictionary server
dict               2628/udp
f5-globalsite      2792/tcp
f5-globalsite      2792/udp
gsiftp             2811/tcp
gsiftp             2811/udp
gpsd               2947/tcp
gpsd               2947/udp
gds-db             3050/tcp         gds_db               # InterBase server
gds-db             3050/udp         gds_db
icpv2              3130/tcp         icp             # Internet Cache Protocol
icpv2              3130/udp         icp
isns               3205/tcp                              # iSNS Server Port
isns               3205/udp                              # iSNS Server Port
iscsi-target       3260/tcp
```

```
mysql               3306/tcp
mysql               3306/udp
nut                 3493/tcp                            # Network UPS Tools
nut                 3493/udp
distcc              3632/tcp                              # distributed compiler
distcc              3632/udp
daap                3689/tcp                            # Digital Audio Access Protocol
daap                3689/udp
svn                 3690/tcp        subversion      # Subversion protocol
svn                 3690/udp        subversion
suucp               4031/tcp                            # UUCP over SSL
suucp               4031/udp
sysrqd              4094/tcp                             # sysrq daemon
sysrqd              4094/udp
sieve               4190/tcp                            # ManageSieve Protocol
epmd                4369/tcp                            # Erlang Port Mapper Daemon
epmd                4369/udp
remctl              4373/tcp                        # Remote Authenticated Command Service
remctl              4373/udp
f5-iquery           4353/tcp                            # F5 iQuery
f5-iquery           4353/udp
ipsec-nat-t         4500/udp                            # IPsec NAT-Traversal [RFC3947]
iax                 4569/tcp                            # Inter-Asterisk eXchange
iax                 4569/udp
mtn                 4691/tcp                            # monotone Netsync Protocol
mtn                 4691/udp
radmin-port         4899/tcp                            # RAdmin Port
radmin-port         4899/udp
rfe                 5002/udp                            # Radio Free Ethernet
rfe                 5002/tcp
mmcc                5050/tcp            # multimedia conference control tool (Yahoo IM)
mmcc                5050/udp
sip                 5060/tcp                            # Session Initiation Protocol
sip                 5060/udp
sip-tls             5061/tcp
sip-tls             5061/udp
aol                 5190/tcp                            # AIM
aol                 5190/udp
xmpp-client         5222/tcp        jabber-client       # Jabber Client Connection
xmpp-client         5222/udp        jabber-client
xmpp-server         5269/tcp        jabber-server       # Jabber Server Connection
xmpp-server         5269/udp        jabber-server
cfengine            5308/tcp
cfengine            5308/udp
mdns                5353/tcp                            # Multicast DNS
mdns                5353/udp
postgresql          5432/tcp        postgres        # PostgreSQL Database
postgresql          5432/udp        postgres
```

```
freeciv                 5556/tcp        rptp                # Freeciv gameplay
freeciv                 5556/udp
amqps                   5671/tcp                            # AMQP protocol over TLS/SSL
amqp                    5672/tcp
amqp                    5672/udp
amqp                    5672/sctp
ggz                     5688/tcp                            # GGZ Gaming Zone
ggz                     5688/udp
x11                     6000/tcp        x11-0               # X Window System
x11                     6000/udp        x11-0
x11-1                   6001/tcp
x11-1                   6001/udp
x11-2                   6002/tcp
x11-2                   6002/udp
x11-3                   6003/tcp
x11-3                   6003/udp
x11-4                   6004/tcp
x11-4                   6004/udp
x11-5                   6005/tcp
x11-5                   6005/udp
x11-6                   6006/tcp
x11-6                   6006/udp
x11-7                   6007/tcp
x11-7                   6007/udp
gnutella-svc            6346/tcp                            # gnutella
gnutella-svc            6346/udp
gnutella-rtr            6347/tcp                            # gnutella
gnutella-rtr            6347/udp
sge-qmaster             6444/tcp        sge_qmaster         # Grid Engine Qmaster Service
sge-qmaster             6444/udp        sge_qmaster
sge-execd               6445/tcp        sge_execd           # Grid Engine Execution Service
sge-execd               6445/udp        sge_execd
mysql-proxy             6446/tcp                            # MySQL Proxy
mysql-proxy             6446/udp
babel                   6696/udp                            # Babel Routing Protocol
ircs-u                  6697/tcp                            # Internet Relay Chat via TLS/SSL
afs3-fileserver 7000/tcp        bbs                 # file server itself
afs3-fileserver 7000/udp        bbs
afs3-callback           7001/tcp                            # callbacks to cache managers
afs3-callback           7001/udp
afs3-prserver           7002/tcp                            # users & groups database
afs3-prserver           7002/udp
afs3-vlserver           7003/tcp                            # volume location database
afs3-vlserver           7003/udp
afs3-kaserver           7004/tcp                            # AFS/Kerberos authentication
afs3-kaserver           7004/udp
afs3-volser             7005/tcp                            # volume managment server
afs3-volser             7005/udp
```

```
afs3-errors        7006/tcp                          # error interpretation service
afs3-errors        7006/udp
afs3-bos        7007/tcp                          # basic overseer process
afs3-bos        7007/udp
afs3-update        7008/tcp                          # server-to-server updater
afs3-update        7008/udp
afs3-rmtsys        7009/tcp                          # remote cache manager service
afs3-rmtsys        7009/udp
font-service        7100/tcp        xfs               # X Font Service
font-service        7100/udp        xfs
http-alt        8080/tcp        webcache        # WWW caching service
http-alt        8080/udp
puppet            8140/tcp                          # The Puppet master service
bacula-dir        9101/tcp                          # Bacula Director
bacula-dir        9101/udp
bacula-fd        9102/tcp                          # Bacula File Daemon
bacula-fd        9102/udp
bacula-sd        9103/tcp                          # Bacula Storage Daemon
bacula-sd        9103/udp
xmms2            9667/tcp            # Cross-platform Music Multiplexing System
xmms2            9667/udp
nbd            10809/tcp                          # Linux Network Block Device
zabbix-agent        10050/tcp                          # Zabbix Agent
zabbix-agent        10050/udp
zabbix-trapper        10051/tcp                          # Zabbix Trapper
zabbix-trapper        10051/udp
amanda            10080/tcp                          # amanda backup services
amanda            10080/udp
dicom            11112/tcp
hkp            11371/tcp                          # OpenPGP HTTP Keyserver
hkp            11371/udp
bprd            13720/tcp                          # VERITAS NetBackup
bprd            13720/udp
bpdbm            13721/tcp                          # VERITAS NetBackup
bpdbm            13721/udp
bpjava-msvc        13722/tcp                          # BP Java MSVC Protocol
bpjava-msvc        13722/udp
vnetd            13724/tcp                          # Veritas Network Utility
vnetd            13724/udp
bpcd            13782/tcp                          # VERITAS NetBackup
bpcd            13782/udp
vopied            13783/tcp                          # VERITAS NetBackup
vopied            13783/udp
db-lsp            17500/tcp                          # Dropbox LanSync Protocol
dcap            22125/tcp                          # dCache Access Protocol
gsidcap            22128/tcp                          # GSI dCache Access Protocol
wnn6            22273/tcp                          # wnn6
wnn6            22273/udp
```

```
#
# Datagram Delivery Protocol services
#
rtmp                1/ddp                           # Routing Table Maintenance Protocol
nbp                 2/ddp                           # Name Binding Protocol
echo                4/ddp                           # AppleTalk Echo Protocol
zip                 6/ddp                           # Zone Information Protocol


#==========================================================================
# The remaining port numbers are not as allocated by IANA.
#==========================================================================


# Kerberos (Project Athena/MIT) services
# Note that these are for Kerberos v4, and are unofficial.  Sites running
# v4 should uncomment these and comment out the v5 entries above.
#
kerberos4           750/udp         kerberos-iv kdc       # Kerberos (server)
kerberos4           750/tcp         kerberos-iv kdc
kerberos-master     751/udp             kerberos_master       # Kerberos authentication
kerberos-master     751/tcp
passwd-server       752/udp             passwd_server       # Kerberos passwd server
krb-prop        754/tcp             krb_prop krb5_prop hprop # Kerberos slave propagation
krbupdate       760/tcp             kreg                # Kerberos registration
swat                901/tcp                         # swat
kpop                1109/tcp                        # Pop with Kerberos
knetd               2053/tcp                        # Kerberos de-multiplexor
zephyr-srv      2102/udp                        # Zephyr server
zephyr-clt      2103/udp                        # Zephyr serv-hm connection
zephyr-hm       2104/udp                        # Zephyr hostmanager
eklogin             2105/tcp                        # Kerberos encrypted rlogin
# Hmmm. Are we using Kv4 or Kv5 now? Worrying.
# The following is probably Kerberos v5  --- ajt@debian.org (11/02/2000)
kx              2111/tcp                    # X over Kerberos
iprop           2121/tcp                        # incremental propagation
#
# Unofficial but necessary (for NetBSD) services
#
supfilesrv      871/tcp                             # SUP server
supfiledbg      1127/tcp                        # SUP debugging


#
# Services added for the Debian GNU/Linux distribution
#
linuxconf       98/tcp                              # LinuxConf
poppassd        106/tcp                             # Eudora
poppassd        106/udp
moira-db        775/tcp             moira_db        # Moira database
```

```
moira-update       777/tcp         moira_update      # Moira update protocol
moira-ureg         779/udp        moira_ureg        # Moira user registration
spamd              783/tcp                            # spamassassin daemon
omirr              808/tcp         omirrd              # online mirror
omirr              808/udp         omirrd
customs           1001/tcp                      # pmake customs server
customs           1001/udp
skkserv           1178/tcp                      # skk jisho server port
predict           1210/udp                      # predict -- satellite tracking
rmtcfg            1236/tcp                     # Gracilis Packeten remote config server
wipld             1300/tcp                    # Wipl network monitor
xtel              1313/tcp                  # french minitel
xtelw             1314/tcp                   # french minitel
support           1529/tcp                     # GNATS
cfinger           2003/tcp                     # GNU Finger
frox              2121/tcp                   # frox: caching ftp proxy
ninstall          2150/tcp                # ninstall service
ninstall          2150/udp
zebrasrv          2600/tcp                # zebra service
zebra             2601/tcp                   # zebra vty
ripd              2602/tcp                  # ripd vty (zebra)
ripngd            2603/tcp                   # ripngd vty (zebra)
ospfd             2604/tcp                  # ospfd vty (zebra)
bgpd              2605/tcp                 # bgpd vty (zebra)
ospf6d            2606/tcp                   # ospf6d vty (zebra)
ospfapi           2607/tcp                    # OSPF-API
isisd             2608/tcp                  # ISISd vty (zebra)
afbackup          2988/tcp                # Afbackup system
afbackup          2988/udp
afmbackup         2989/tcp                 # Afmbackup system
afmbackup         2989/udp
xtell             4224/tcp                   # xtell server
fax               4557/tcp                 # FAX transmission service (old)
hylafax           4559/tcp                    # HylaFAX client-server protocol (new)
distmp3           4600/tcp                    # distmp3host daemon
munin             4949/tcp        lrrd              # Munin
enbd-cstatd       5051/tcp                 # ENBD client statd
enbd-sstatd       5052/tcp                 # ENBD server statd
pcrd              5151/tcp                  # PCR-1000 Daemon
noclog            5354/tcp                   # noclogd with TCP (nocol)
noclog            5354/udp                   # noclogd with UDP (nocol)
hostmon           5355/tcp                    # hostmon uses TCP (nocol)
hostmon           5355/udp                    # hostmon uses UDP (nocol)
rplay             5555/udp                  # RPlay audio service
nrpe              5666/tcp                 # Nagios Remote Plugin Executor
nsca              5667/tcp                 # Nagios Agent - NSCA
mrtd              5674/tcp                 # MRT Routing Daemon
bgpsim            5675/tcp                   # MRT Routing Simulator
```

```
canna                   5680/tcp                            # cannaserver
syslog-tls        6514/tcp                          # Syslog over TLS [RFC5425]
sane-port         6566/tcp          sane saned       # SANE network scanner daemon
ircd                    6667/tcp                          # Internet Relay Chat
zope-ftp          8021/tcp                         # zope management by ftp
tproxy                  8081/tcp                            # Transparent Proxy
omniorb                  8088/tcp                            # OmniORB
omniorb                  8088/udp
clc-build-daemon 8990/tcp                           # Common lisp build daemon
xinetd                  9098/tcp
mandelspawn             9359/udp          mandelbrot       # network mandelbrot
git                     9418/tcp                           # Git Version Control System
zope                    9673/tcp                            # zope server
webmin                  10000/tcp
kamanda                 10081/tcp                             # amanda backup services (Kerberos)
kamanda                 10081/udp
amandaidx         10082/tcp                          # amanda backup services
amidxtape         10083/tcp                          # amanda backup services
smsqp                   11201/tcp                            # Alamin SMS gateway
smsqp                   11201/udp
xpilot                  15345/tcp                            # XPilot Contact Port
xpilot                  15345/udp
sgi-cmsd          17001/udp                     # Cluster membership services daemon
sgi-crsd          17002/udp
sgi-gcd                 17003/udp                           # SGI Group membership daemon
sgi-cad                 17004/tcp                           # Cluster Admin daemon
isdnlog                 20011/tcp                           # isdn logging system
isdnlog                 20011/udp
vboxd                   20012/tcp                            # voice box system
vboxd                   20012/udp
binkp                   24554/tcp                            # binkp fidonet protocol
asp              27374/tcp                         # Address Search Protocol
asp              27374/udp
csync2                  30865/tcp                            # cluster synchronization tool
dircproxy         57000/tcp                         # Detachable IRC Proxy
tfido                   60177/tcp                           # fidonet EMSI over telnet
fido                    60179/tcp                           # fidonet EMSI over TCP

# Local services


Out[9]: ''

In [14]: a=fp.read(100)
         print(a)
         type(a)

#
# Note that it is presently the policy of IANA to assign a single well-known
```

```
# port number for bot


Out[14]: str

In [15]: #fp.readlines()

In [16]: wholefile=fp.read()    # read the whole rest of the file

In [17]: fp.seek(10)
         fp.read(10)

Out[17]: 'services, '

In [18]: fp.close()
```

5   OS and environment

- `sys.argv` list of command line arguments.
- `sys.path` search path for modules
- `sys.exit(0)` exit program
- `os.stat("path")` get system information about file (size, protection, owner, type, timestamps)
- `os.scandir("dirpath")` read content of a file, returns an iterator
- `os.fwalk("dirpath")` recursive content of a file, returns iterator to 4-tuples (name, dirlist, filelist, id)
- `os.system("command line")` execute a program

```
In [1]: import sys
        print(sys.argv)


['/usr/lib/python3/dist-packages/ipykernel/__main__.py', '--debug', '-f', '/home/onur/.local/sha


In [2]: print(sys.path)


['', '/usr/lib/python35.zip', '/usr/lib/python3.5', '/usr/lib/python3.5/plat-x86_64-linux-gnu',


In [3]: sys.path.append('/home/mymodules/mylibrary')
        print(sys.path)

['', '/usr/lib/python35.zip', '/usr/lib/python3.5', '/usr/lib/python3.5/plat-x86_64-linux-gnu',


In [4]: print(sys.copyright)
        print(sys.version, sys.version_info)
```

```
Copyright (c) 2001-2017 Python Software Foundation.
All Rights Reserved.

Copyright (c) 2000 BeOpen.com.
All Rights Reserved.

Copyright (c) 1995-2001 Corporation for National Research Initiatives.
All Rights Reserved.

Copyright (c) 1991-1995 Stichting Mathematisch Centrum, Amsterdam.
All Rights Reserved.
3.5.3 (default, Jan 19 2017, 14:11:04)
[GCC 6.3.0 20170118] sys.version_info(major=3, minor=5, micro=3, releaselevel='final', serial=0)


In [5]: #sys.exit(1)

In [6]: import os
        import time

        os.chdir("/tmp")
        fst=os.stat("/etc/services")
        print(fst)
        print(fst.st_uid, time.asctime(time.localtime(fst.st_mtime)))

os.stat_result(st_mode=33188, st_ino=5983366, st_dev=2081, st_nlink=1, st_uid=0, st_gid=0, st_si
0 Mon Dec 26 04:56:39 2016


In [66]: dircontent=os.scandir("/etc/apt")
         for i in dircontent:
             print(i.name, i.is_dir(), i.stat(), i.path)

listchanges.conf False os.stat_result(st_mode=33188, st_ino=5981767, st_dev=2081, st_nlink=1, st
preferences.d True os.stat_result(st_mode=16877, st_ino=5980418, st_dev=2081, st_nlink=2, st_uid
sources.list~ False os.stat_result(st_mode=33188, st_ino=5980603, st_dev=2081, st_nlink=1, st_ui
sources.list False os.stat_result(st_mode=33188, st_ino=5981266, st_dev=2081, st_nlink=1, st_uid
apt.conf.d True os.stat_result(st_mode=16877, st_ino=5980197, st_dev=2081, st_nlink=2, st_uid=0,
trusted.gpg.d True os.stat_result(st_mode=16877, st_ino=5980412, st_dev=2081, st_nlink=2, st_uid
trusted.gpg False os.stat_result(st_mode=33188, st_ino=5983168, st_dev=2081, st_nlink=1, st_uid=
trusted.gpg~ False os.stat_result(st_mode=33188, st_ino=5983154, st_dev=2081, st_nlink=1, st_uid
sources.list.d True os.stat_result(st_mode=16877, st_ino=5980419, st_dev=2081, st_nlink=2, st_ui


In [67]: for v in os.fwalk("/etc/apt"):
             print(v)

('/etc/apt', ['preferences.d', 'apt.conf.d', 'trusted.gpg.d', 'sources.list.d'], ['listchanges.c
('/etc/apt/preferences.d', [], [], 43)
```

```
('/etc/apt/apt.conf.d', [], ['70debconf', '00CDMountPoint', '01autoremove-kernels', '50appstream
('/etc/apt/trusted.gpg.d', [], ['debian-archive-wheezy-stable.gpg~', 'debian-archive-wheezy-auto
('/etc/apt/sources.list.d', [], ['google-talkplugin.list', 'google-chrome.list', 'deb-multimedia
```

```python
In [ ]: os.system("ls -l /") # don't use. use subprocess instead
```

5.1 Time utilities

- `time.time()` Unix time as a floating point value (seconds since 1st Jan 1970)
- `time.localtime()` Time in structured form
- `time.asctime()` Time as a string in current system config.
- `time.strftime(format,timestruct)` Time in user defined format string
- `time.strptime(inputstring, format)` String to structured time

```python
In [8]: import time
        now=time.time()
        print(now)
        now2=time.localtime(now)
        print("year {}, month {}, day {}, hour: {} minutes: {}".format(
        now2.tm_year, now2.tm_mon, now2.tm_mday, now2.tm_hour, now2.tm_min))
        time.strftime("%Y/%m/%d %H:%M:%S %s",now2)

1540200417.5185628
year 2018, month 10, day 22, hour: 12 minutes: 26


Out[8]: '2018/10/22 12:26:57 1540200417'

In [15]: bt=time.strptime("1999/12/30","%Y/%m/%d")

In [11]: time.asctime()

Out[11]: 'Mon Oct 22 12:29:16 2018'
```

6 Regular expressions

A regular expression matches

- `.` matches any character
- `[c1-c2]` matches all characters in range c1-c2
- `[aeuio]` matches all characters enclosed `[a-z.:-]`
- `[^a-z]` matches anything but a to z
- exp? matches 0 or 1 occurences of regex exp `[a-z]?`
- exp* matches 0 or more occurences of regex exp
- exp+ matches 1 or more occurences of regex exp
- non greedy ?? *? +? Instead of longest, they match smallest
- exp{m,n} exp{m,} exp{,n} m to n occurences of regex
- ^ matches start of the string as position

- $ matches end of the string

```
In [2]: import re
        #print(re.search("[a-z]+","Onur Sehitoglu"))
        #print(re.search("[a-z]+[a-z]+$","Onur Sehitoglu"))
        print(re.match("[a-z]+","Onur Sehitoglu"))
        print(re.match("([a-z]+)([a-z]+$)","onursehitoglu").groups())
        print(re.match("([a-z]+?)([a-z]+)$","onursehitoglu").groups())
        print(re.match("([a-z]{1,5}?)([a-z]{1,8}?)$","onursehitoglu").groups())

None
('onursehitogl', 'u')
('o', 'nursehitoglu')
('onurs', 'ehitoglu')


In [21]: print(re.search("^[0-9.]+$", "123.123123123.123412"))
         print(re.search("^[0[0-9]*$", ".231"))

<_sre.SRE_Match object; span=(0, 20), match='123.123123123.123412'>
None
```

6.1 Grouping

- (exp) Group the expressions.
- (exp)? (exp)* (exp)+ (exp){m,n}
- e1|e2 either e1 or e2

```
In [8]: print(re.search("^[0-9]+(\.[0-9]*)?$", "21312.123"))
        print(re.search("^([A-Z]+|[a-z]+)$", "oNur"))
        sname=re.search("^(([A-Z]+|[a-z]+) ?)+$", "onur tolga SEHITOGLU ")
        print(sname)

<_sre.SRE_Match object; span=(0, 9), match='21312.123'>
None
<_sre.SRE_Match object; span=(0, 21), match='onur tolga SEHITOGLU '>


In [9]: print(sname.start(), sname.end(), sname.span(), sname.group(), sname.groups())


0 21 (0, 21) onur tolga SEHITOGLU  ('SEHITOGLU ', 'SEHITOGLU')


In [20]: match=re.search("([a-z]+) ([a-z]+) ([a-z]+)", "+|+onur tolga sehitoglu><bla bla")

         print(match.group())
         print(match.groups())
```

```
onur tolga sehitoglu
('onur', 'tolga', 'sehitoglu')


In [21]: match=re.search("(?P<name>[a-z]+) ([a-z]+) (?P<sname>[a-z]+)", "onur tolga sehitoglu")

In [32]: match.groupdict()

Out[32]: {'name': 'onur', 'sname': 'sehitoglu'}

In [3]: match=re.search("(?P<word>[a-z]+) (?P=word)","onur tolga")
        print(match)
        match=re.search("(?P<word>[a-z]+) (?P=word)","onur onur")
        print(match)

None
<_sre.SRE_Match object; span=(0, 9), match='onur onur'>


In [33]: print(re.search("^([a-z]+|[A-Z]+) \\1$", "onur onur"))
         print(re.search("^([a-z]+|[A-Z]+) ([a-z]+) \\1$", "onur tolga onur"))
         print(re.search("^([a-z]+|[A-Z]+) ([a-z]+) \\2$", "onur tolga tolga"))

<_sre.SRE_Match object; span=(0, 9), match='onur onur'>
<_sre.SRE_Match object; span=(0, 15), match='onur tolga onur'>
<_sre.SRE_Match object; span=(0, 16), match='onur tolga tolga'>
```