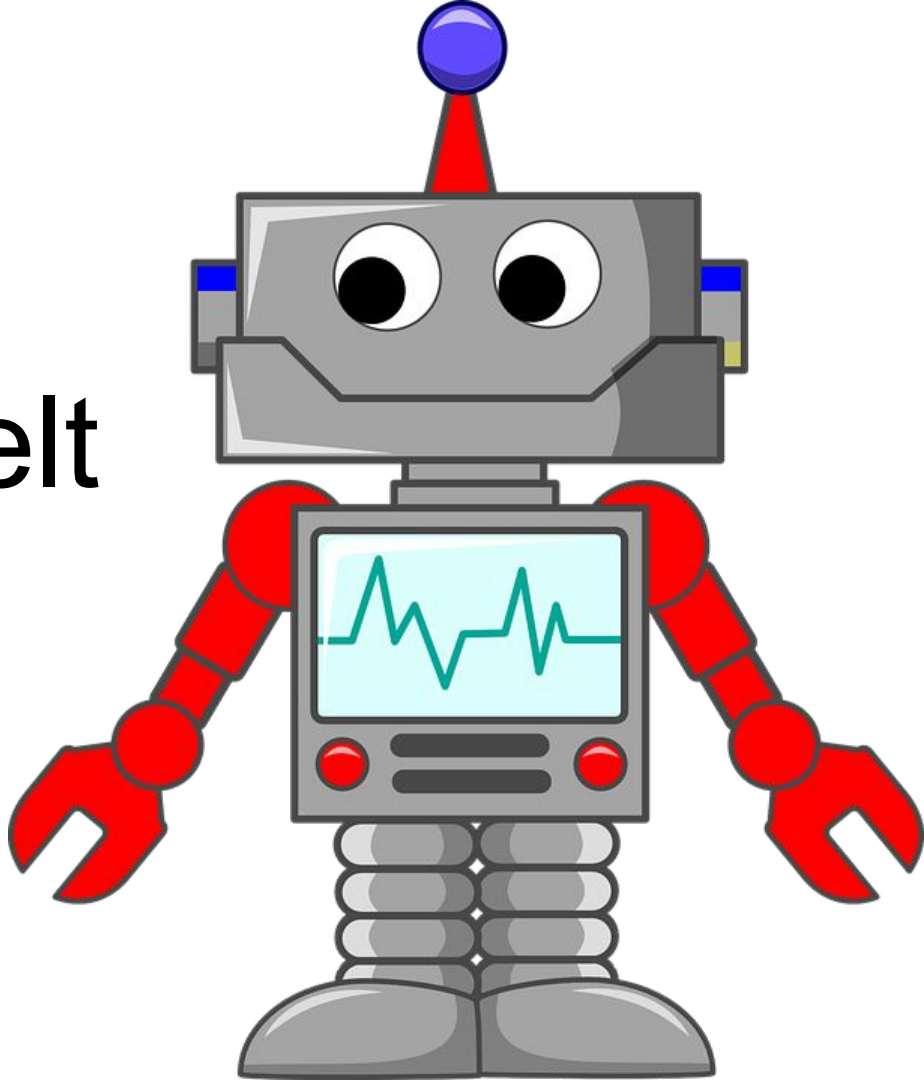
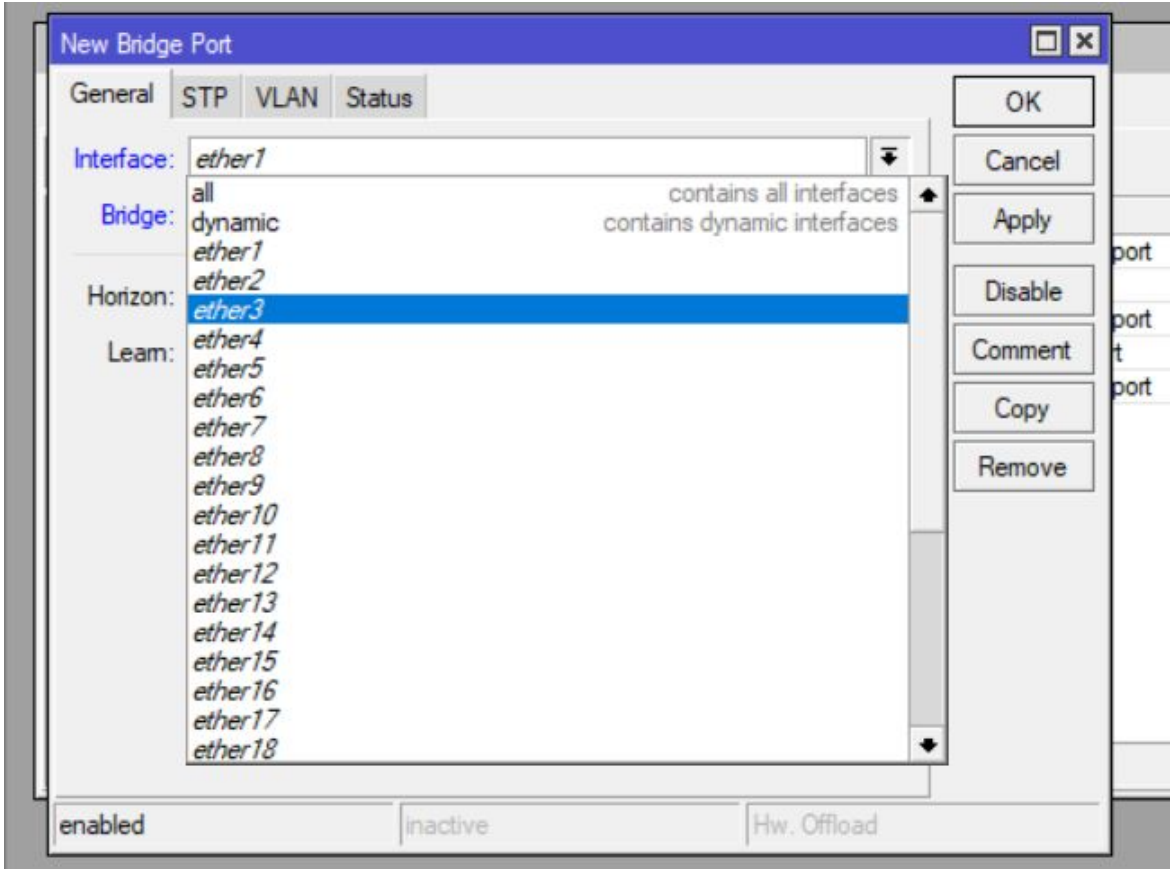
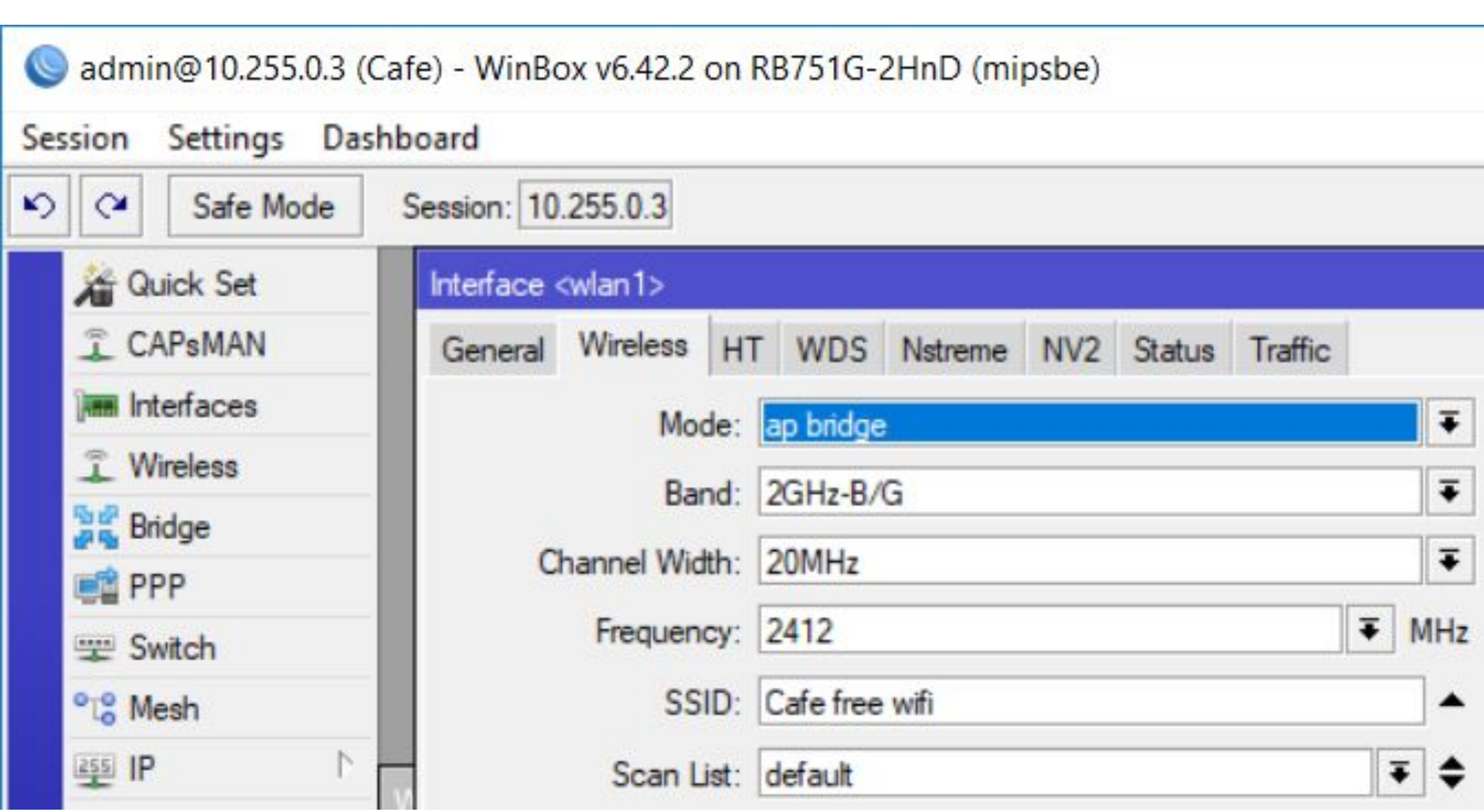
Have you ever felt like a robot?

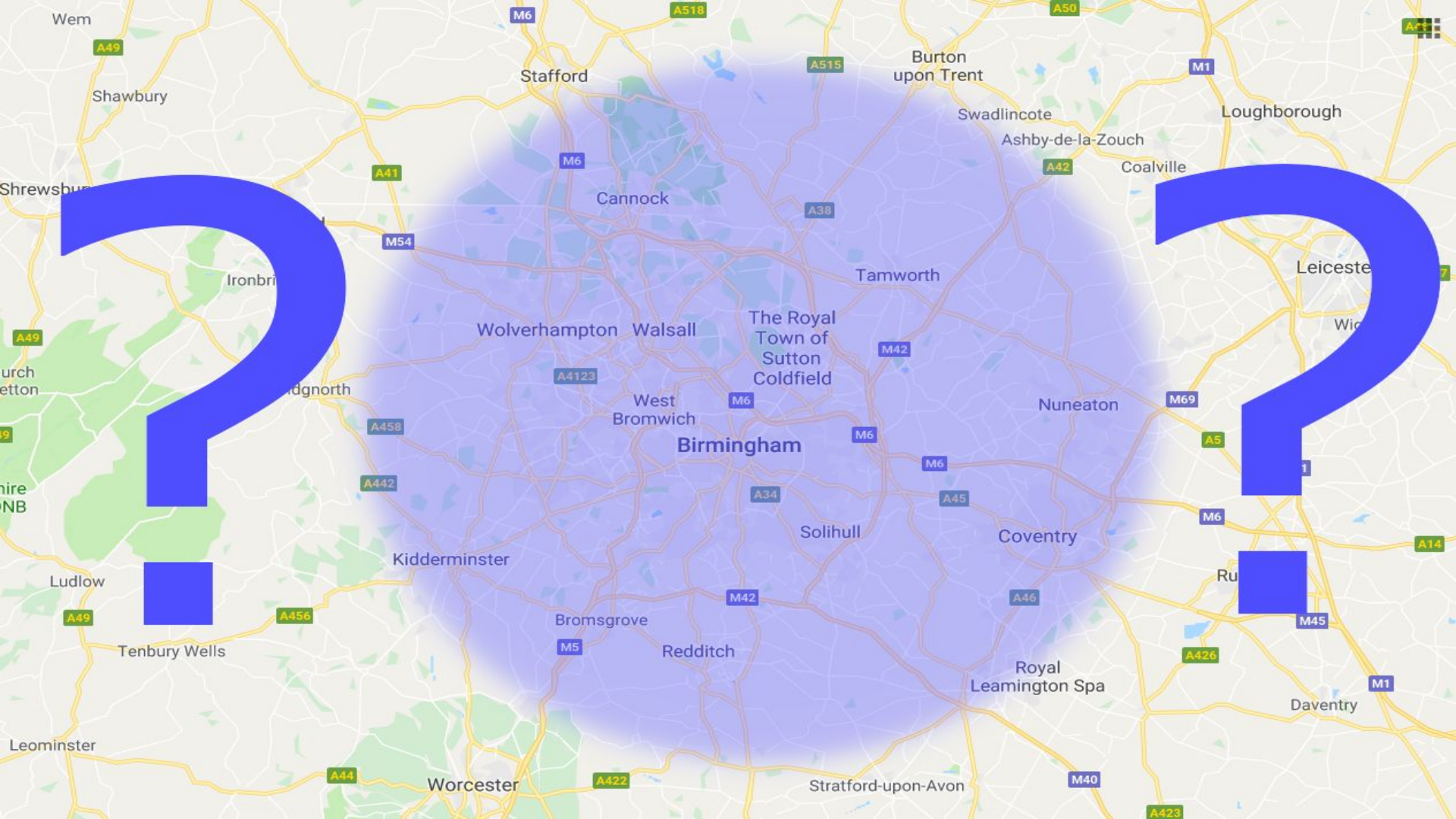


Try adding 23 ports to a bridge...



Let’s see...


admin@10.255.0.3 (Cafe) - WinBox v6.42.2 on RB751G-2HnD (mipsbe)
Session
Settings
Dashboard
Safe Mode
Session: 10.255.0.3
Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
Interface <wlan1>
General
Wireless
HT
WDS
Nstreme
NV2
Status
Traffic
Mode: ap bridge
Band: 2GHz-B/G
Channel Width: 20MHz
Frequency: 2412 MHz
SSID: Cafe free wifi
Scan List: default

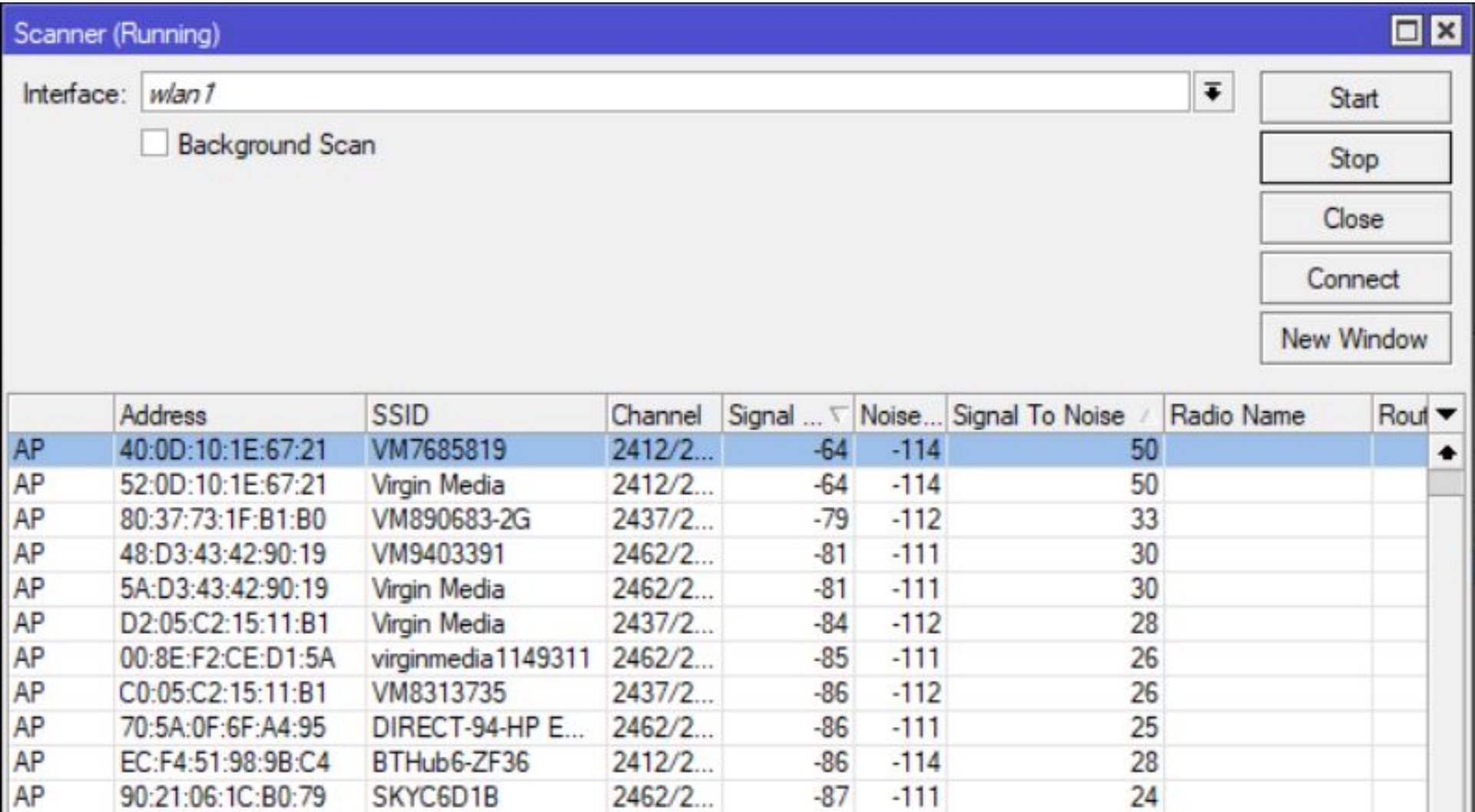

Wem
A49
Shawbury
M6
A518
Stafford
A515
Burton upon Trent
A50
M1
Swadlincote
Loughborough
Ashby-de-la-Zouch
A42
Coalville
A41
Cannock
A38
M54
Tamworth
Leiceste
Ironbri
A49
Wolverhampton
Walsall
The Royal Town of Sutton Coldfield
M42
A4123
West Bromwich
M6
Nuneaton
M69
A458
Birmingham
M6
A5
M6
A442
A34
A45
M6
Solihull
Coventry
A14
Kidderminster
Ludlow
A49
A456
M42
A46
M45
Bromsgrove
Tenbury Wells
M5
Redditch
A426
Royal Leamington Spa
M1
Daventry
Leominster
A44
Worcester
A422
Stratford-upon-Avon
M40
A423

Google Geolocation API

```
{
  "homeMobileCountryCode": 310,
  "homeMobileNetworkCode": 410,
  "radioType": "gsm",
  "carrier": "Vodafone",
  "considerIp": "true",
  "cellTowers": [
    // See the Cell Tower Objects section below.
  ],
  "wifiAccessPoints": [
    // See the WiFi Access Point Objects section below.
  ]
}
```

Google Geolocation API - only WiFi

```
{
  "wifiAccessPoints": [
    {
      "macAddress": "00:25:9c:cf:1c:ac",
      "signalStrength": -43,
    },
    {
      "macAddress": "00:12:23:00:56:78",
      "signalStrength": -62,
    },
......
  ]
}
```



	Address	SSID	Channel	Signal ...	Noise...	Signal To Noise	Radio Name	Rout
AP	40:0D:10:1E:67:21	VM7685819	2412/2...	-64	-114	50		
AP	52:0D:10:1E:67:21	Virgin Media	2412/2...	-64	-114	50		
AP	80:37:73:1F:B1:B0	VM890683-2G	2437/2...	-79	-112	33		
AP	48:D3:43:42:90:19	VM9403391	2462/2...	-81	-111	30		
AP	5A:D3:43:42:90:19	Virgin Media	2462/2...	-81	-111	30		
AP	D2:05:C2:15:11:B1	Virgin Media	2437/2...	-84	-112	28		
AP	00:8E:F2:CE:D1:5A	virginmedia1149311	2462/2...	-85	-111	26		
AP	C0:05:C2:15:11:B1	VM8313735	2437/2...	-86	-112	26		
AP	70:5A:0F:6F:A4:95	DIRECT-94-HP E...	2462/2...	-86	-111	25		
AP	EC:F4:51:98:9B:C4	BTHub6-ZF36	2412/2...	-86	-114	28		
AP	90:21:06:1C:B0:79	SKYC6D1B	2462/2...	-87	-111	24		

Google Geolocation API - the result


```
{
  "location": {
    "lat": 51.0,
    "lng": -0.1
  },
  "accuracy": 1200.4
}
```


And finally we can do:

https://www.google.com/maps/?q=51.0,-0.1

Geolocation - summary of the steps

1. Run the scan on the wireless interfaces
2. Prepare the JSON query with few empty MACs
3. Copy-paste the MAC addresses and signals
4. Run the API query, open the result
5. Copy-paste the coordinates to HTTP link

Geolocation - the script

```
# Main application file for geoMikroTik project.
# https://github.com/etartik/geoMikroTik/
# Copyright: Daniel Starnowski 2018
# Shared under the MIT License

# Put your Google Geolocation API key here:
:local apiKey "XXXXXXXX";

# splitFileLines - function creating array of non-empty lines from the file
# Example: :local fileLinesArray [$splitFileLines "disk1/example.txt"]
:local splitFileLines do={
  :local file [/file get "$1" contents];
  :local fileLines [:toarr ""];
  :local filePosition 0;
  :local endFile 0;
  :while ($endFile<1) do={
    :local nextNF [:find $file "\n" $filePosition]
    :if ([:typeof $nextNF]="nil") do={
      :set $endFile 1;
    } else={
     :if (($nextNF-$filePosition)>1) do={
       :set $fileLines ($fileLines,[:pick $file $filePosition $nextNF]);
      }
      :set $filePosition ($nextNF+1);
    }
  }
  :return $fileLines;
}

# prepareJSON - function creating the JSON request data for Google Geolocation API from the array of wireless scan lines
# Example: :local http-data [$prepareJSON $fileLinesArray]
:local prepareJSON do={
  :local request "{\"wifiAccessPoints\":[";
  :local firstLine 1;
  :foreach line in=$1 do={
    :local s1 [:find $line "," ];
    :local s2 [:find $line "," $s1];
    :local s3 [:find $line "," ($s2+1)];
    :local s4 [:find $line "," $s3];
    :local macAddr [:pick $line 0 $s1];
    :local signal [:pick $line ($s3+1) $s4];
    :if ($firstLine<1) do={
      :set $request ($request . ",");
    } else={
      :set $firstLine 0;
    }
    :set $request ($request . "{\"macAddress\":\"$macAddr\",\"signalStrength\":\"$signal\"}");
  }
  :set $request ($request . "]}");
  :return $request;
}

# getGoogleLocation - function getting latitude, longitude and Accuracy data from the Google Geolocation API response (array of lines)
# response is in form of array with keys: lat, lon, acc and valid (valid=0 - no position, valid=1 - position found)
# Example: :if ([$getGoogleLocation $fileLocationArray]->"valid">0) {:local accuracy ([$getGoogleLocation $fileLocationArray]->"acc");}
:local getGoogleLocation do={
  :local valid 0;
  :local lat 0;
  :local lon 0;
  :local acc 0;
  :foreach line in=$1 do={
    :if ([:typeof [:find $line "\"lat\":"]]!="nil") do={
      :set $valid ($valid+1);
      :set $lat [:pick $line ([:find $line "\"lat\":"]+7) [:find $line "," ([:find $line "\"lat\":"]+7)]];
    }
    :if ([:typeof [:find $line "\"lng\":"]]!="nil") do={
      :set $valid ($valid+1);
      :set $lon [:pick $line ([:find $line "\"lng\":"]+7) [:len $line]];
    }
    :if ([:typeof [:find $line "\"accuracy\":"]]!="nil") do={
      :set $valid ($valid+1);
      :set $acc [:pick $line ([:find $line "\"accuracy\":"]+12) [:len $line]];
    }
  }
  :if ($valid<3) do={
    :return {valid=0};
  } else={
    :return {valid=1;lat="$lat";lon="$lon";acc="$acc"};
  }
}

# Initialize table for AP list
:local apList [:toarr ""];

# Run wireless scan on all wireless interfaces and store results in separate array lines
:foreach wifiInterface in=[/interface wireless find] do={
  :local fileName ("geoMikroTikScan-" . [/interface wireless get $wifiInterface name] . ".scan");
  /interface wireless scan $wifiInterface duration=10s save-file="$fileName";
}

# Wait for the files to be written
:delay 2s;

# Fill the AP list from the geoMikroTik.scan files
:foreach scanFile in=[/file find name~"geoMikroTikScan-"] do={
  :local fileName [/file get $scanFile name];
  :set $apList ($apList,[$splitFileLines $fileName]);
  /file remove $fileName;
}

# Prepare and send the Google API JSON request
:local httpData [$prepareJSON $apList];
/tool fetch url="https://www.googleapis.com/geolocation/v1/geolocate\?key=$apiKey" http-content-type="application/json" http-method=post http-data="$httpData" dst-path="locationFile.txt";
:delay 2s;

# Parse the results
:local locationFile [$splitFileLines "locationFile.txt"];
:local result [$getGoogleLocation $locationFile];
:put "";
:put "";
:put "";
:if ($result->"valid">0) do={
```

```
# Initialize table for AP list
:local apList [:toarr ""];

# Run wireless scan on all wireless interfaces and store results in separate array lines
:foreach wifiInterface in=[/interface wireless find] do={
  :local fileName ("geoMikroTikScan-" . [/interface wireless get $wifiInterface name] . ".scan");
  /interface wireless scan $wifiInterface duration=10s save-file="$fileName";
}

# Wait for the files to be written
:delay 2s;

# Fill the AP list from the geoMikroTik.scan files
:foreach scanfile in=[/file find name~"geoMikroTikScan-"] do={
  :local fileName [/file get $scanfile name];
  :set $apList ($apList,[$splitFileLines $fileName]);
  /file remove $fileName;
}

# Prepare and send the Google API JSON request
:local httpData [$prepareJSON $apList];
/tool fetch url="https://www.googleapis.com/geolocation/v1/geolocate\?key=$apiKey" http-content-type="application/json" http-method=post http-data="$httpData" dst-path="locationFile.txt";
:delay 2s;

# Parse the results
:local locationFile [$splitFileLines "locationFile.txt"];
:local result [$getGoogleLocation $locationFile];
:put "";
:put "";
:put "";
:if (($result->"valid")>0) do={
  :local lat ($result->"lat");
  :local lon ($result->"lon");
  :local acc ($result->"acc");
  :put "Coordinates found:"
  :put "Latitude: $lat";
  :put "Longitude: $lon";
  :put "Accuracy: $acc m";
  :put "Direct Google Maps link:";
  :put "https://www.google.com/maps/\?q=$lat,$lon";
} else={
  :put "Unfortunately, couldn't get location.";
}
```

```
[admin@MikroTik] > sys script run geoMikroTik
Flags: A - active, P - privacy, R - routeros-network, N - nstreme, T - tdma, W - wds, B - bridge
      ADDRESS           SSID                                CHANNEL                          SIG   NF SNR RADIO-NAME
AP    40:0D:10:1E:67:21 VM7685819                           2412/20/gn                       -71 -106  35
AP    52:0D:10:1E:67:21 Virgin Media                        2412/20/gn                       -73 -106  33
AP    C8:0C:C8:9F:EB:6C TALKTALK9FEB66                      2432/20/gn                       -91 -106  15
AP    D2:05:C2:15:11:B1 Virgin Media                        2437/20/gn                       -90 -106  16
AP    80:37:73:1F:B1:B0 VM890683-2G                         2437/20/gn                       -84 -106  22
AP    C0:05:C2:15:11:B1 VM8313735                           2437/20/gn                       -87 -106  19
AP    2C:B0:5D:D7:F6:25 virginmedia1220263                  2437/20/gn                       -88 -106  18
AP    00:8E:F2:CE:D1:5A virginmedia1149311                  2462/20/gn                       -90 -106  16
AP    5A:D3:43:42:90:19 Virgin Media                        2462/20/gn                       -84 -106  22
AP    48:D3:43:42:90:19 VM9403391                           2462/20/gn                       -87 -106  19
AP    90:21:06:1C:B0:79 SKYC6D1B                            2462/20/gn                       -90 -106  16
AP    C4:10:8A:19:76:C8 Isomer                              2472/20/gn                       -89 -107  18

Flags: A - active, P - privacy, R - routeros-network, N - nstreme, T - tdma, W - wds, B - bridge
      ADDRESS           SSID                                CHANNEL                          SIG   NF SNR RADIO-NAME
AP    80:37:73:3B:32:80 VM890683-5G                         5180/20-Ce/ac/P                  -84 -105  21
AP    40:0D:10:1E:67:27 VM7685819                           5220/20-eeCe/ac/P                -73 -103  30
AP    90:21:06:D9:4F:FD SKY83AFB                            5180/20-Ceee/ac/P                -86 -105  19

      status: finished
  downloaded: 0KiBC-z pause]
    duration: 1s



Coordinates found:
Latitude: 51.4732423
Longitude: -0.8555551
Accuracy: 29.0 m
Direct Google Maps link:
https://www.google.com/maps/?q=51.4732423,-0.8555551
[admin@MikroTik] >
```

Few questions we’re going to answer

- Where can we have the scripts on the router?
- What can we do with the scripts?
- How can we run a script?
- How can we make the script nice and clear?

The scripts - where?

The scripts - where? - in the CLI!

```
:foreach lease in=[/ip dhcp-server lease find] do={
  :local mac [/ip dhcp-server lease get $lease mac-address];
  :local name [/ip dhcp-server lease get $lease host-name];
  :local ip [/ip dhcp-server lease get $lease address];
  :put "MAC address: $mac, IP: $ip, host name: $name"
}
```

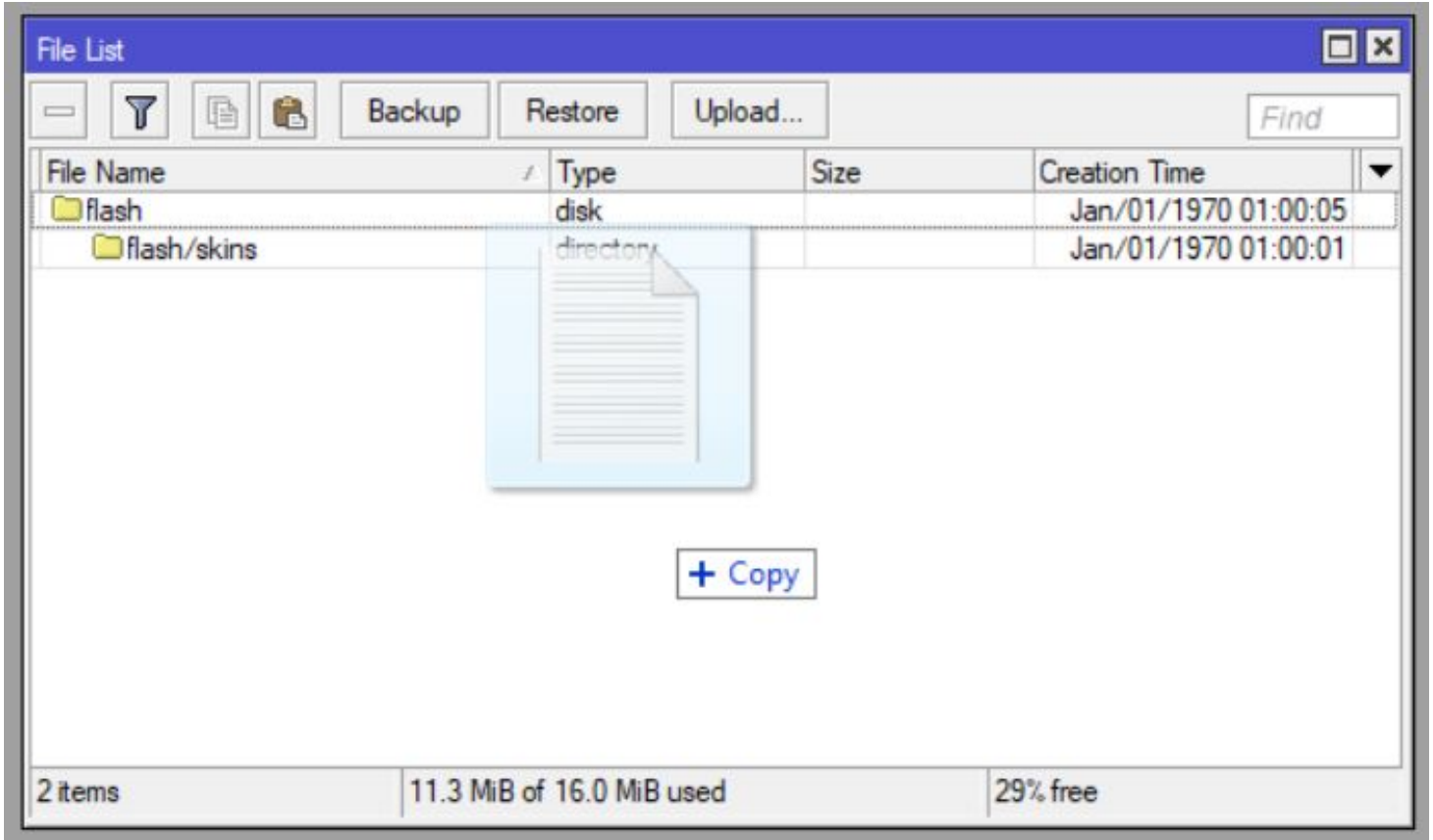
The scripts - where? - in the CLI!

```
[admin@MikroTik] > :foreach lease in=[/ip dhcp-server lease find] do={:local mac [/ip dhcp-server l
ease get $lease mac-address]; :local name [/ip dhcp-server lease get $lease host-name]; :local ip [
/ip dhcp-server lease get $lease address]; :put "MAC address: $mac, IP: $ip, host name: $name"}
MAC address: 94:65:2D:C7:D5:55, IP: 10.255.0.253, host name: OnePlus_5T
MAC address: 58:FB:84:8F:EE:2C, IP: 10.255.0.252, host name: DESKTOP-C2IH9JK
MAC address: 30:07:4D:A4:48:93, IP: 10.255.0.251, host name: Galaxy-S8
MAC address: 00:0C:42:F9:97:18, IP: 10.255.0.3, host name: Cafe
MAC address: E4:8D:8C:17:D7:36, IP: 10.255.0.248, host name: MikroTik
MAC address: 00:08:9B:F8:6A:05, IP: 10.255.0.5, host name: NASF86A05
MAC address: 18:DB:F2:15:57:C8, IP: 10.255.0.99, host name: AIR007027
MAC address: DC:9F:DB:80:9D:1A, IP: 10.255.0.11, host name: AirCam
MAC address: F0:23:B9:42:B4:AA, IP: 10.255.0.12, host name: H.VIEW
MAC address: CC:2D:E0:81:0E:2F, IP: 10.255.0.2, host name: MikroTik
MAC address: 98:29:A6:46:97:03, IP: 10.255.0.250, host name: LAPTOP-UNJMN524
[admin@MikroTik] >
```

The scripts - where? - in the CLI!

```
[admin@MikroTik] > {
{...  :local x 1
{...  :local y 2
{...  :put "1 + 2 = $($x+$y)"
{...  }
1 + 2 = 3
[admin@MikroTik] >
```

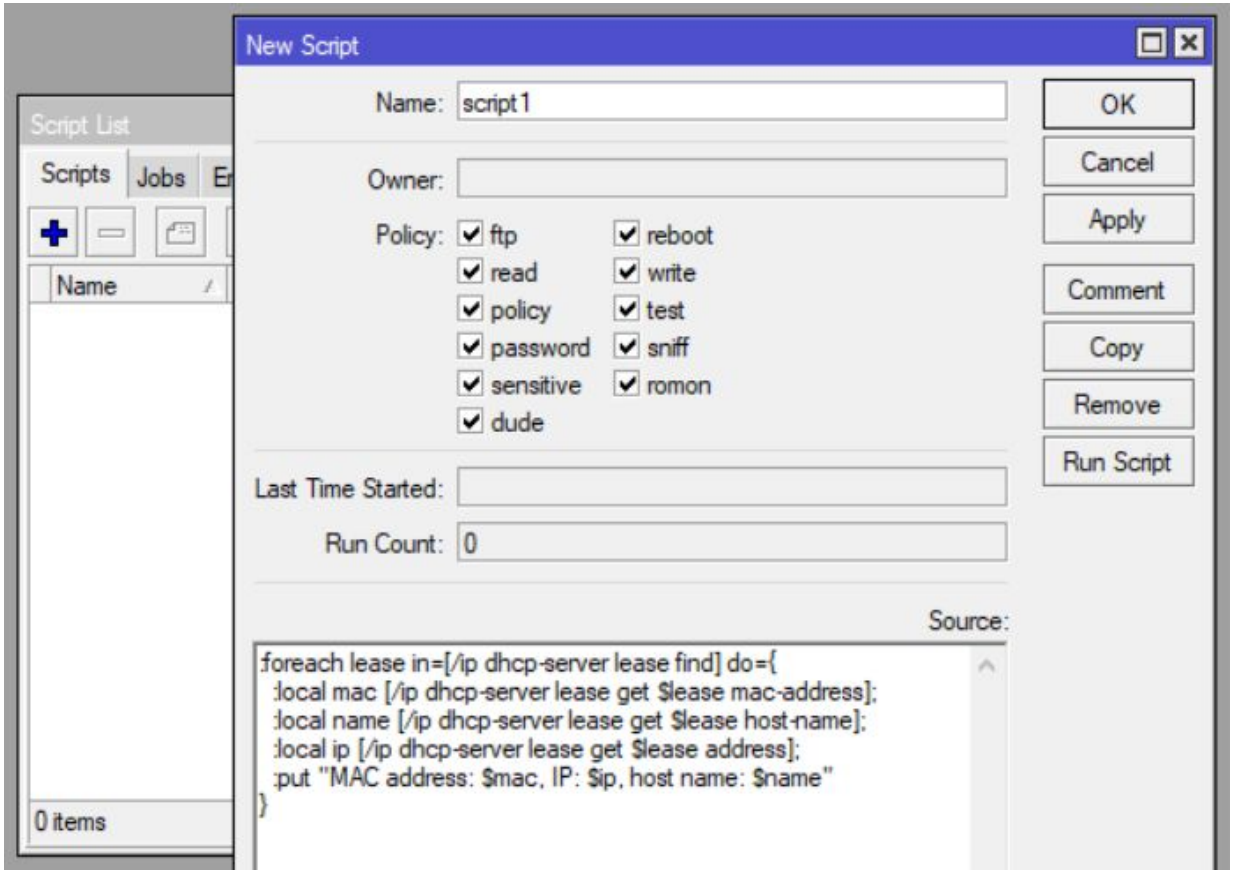
The scripts - where? - in the file!



The scripts - where? - in the file!

```
[admin@MikroTik] > /import script.txt
MAC address: 94:65:2D:C7:D5:55, IP: 10.255.0.253, host name: OnePlus_5T
MAC address: 58:FB:84:8F:EE:2C, IP: 10.255.0.252, host name: DESKTOP-C2IH9JK
MAC address: 30:07:4D:A4:48:93, IP: 10.255.0.251, host name: Galaxy-S8
MAC address: 00:0C:42:F9:97:18, IP: 10.255.0.3, host name: Cafe
MAC address: E4:8D:8C:17:D7:36, IP: 10.255.0.248, host name: MikroTik
MAC address: 00:08:9B:F8:6A:05, IP: 10.255.0.5, host name: NASF86A05
MAC address: 18:DB:F2:15:57:C8, IP: 10.255.0.99, host name: AIR007027
MAC address: DC:9F:DB:80:9D:1A, IP: 10.255.0.11, host name: AirCam
MAC address: F0:23:B9:42:B4:AA, IP: 10.255.0.12, host name: H.VIEW
MAC address: CC:2D:E0:81:0E:2F, IP: 10.255.0.2, host name: MikroTik
MAC address: 98:29:A6:46:97:03, IP: 10.255.0.250, host name: LAPTOP-UNJMN524

Script file loaded and executed successfully
[admin@MikroTik] >
```

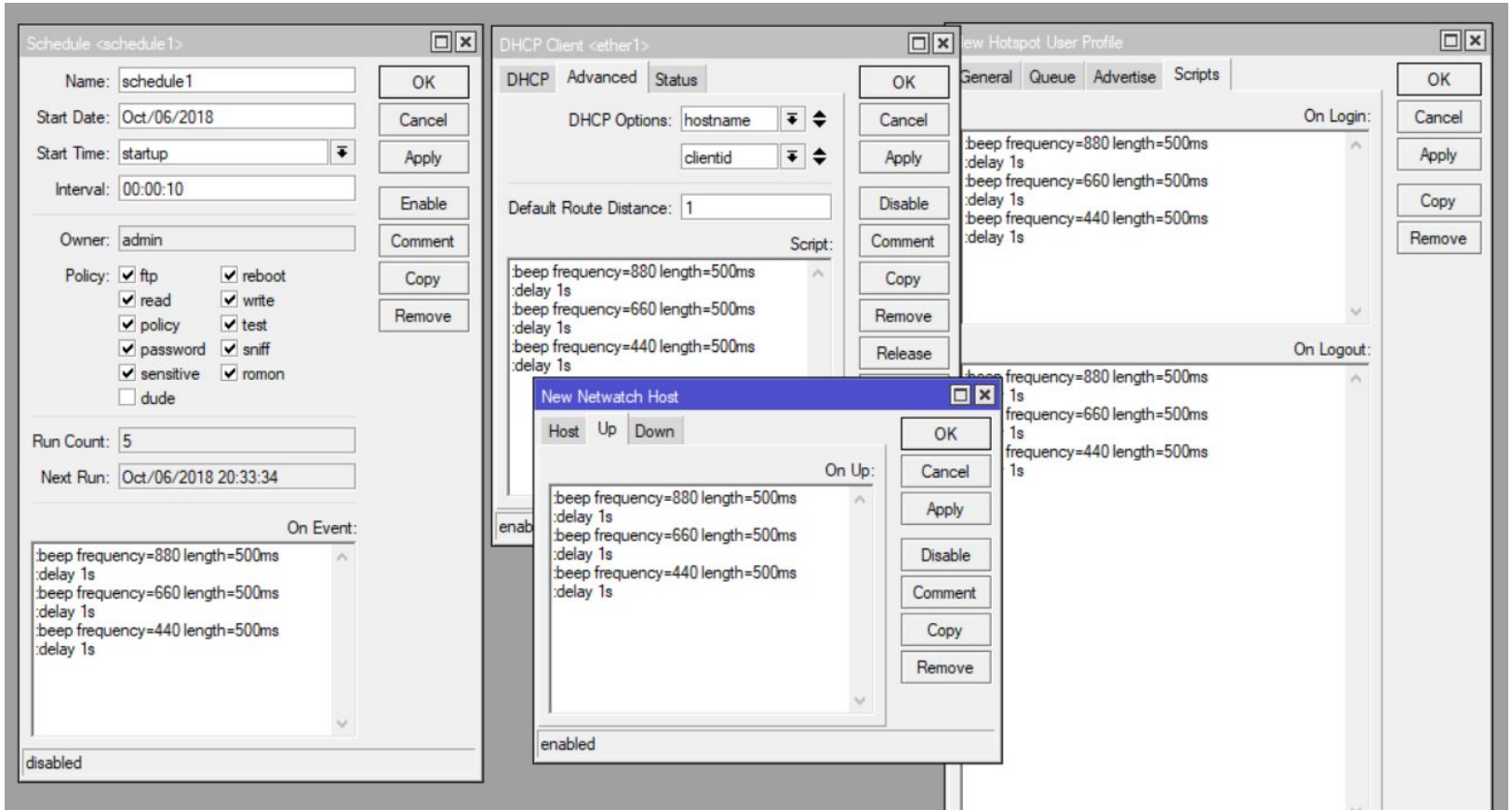
The scripts - where? - in the scripts!



The scripts - where? - in the scripts!

```
[admin@MikroTik] > /system script run script1
MAC address: 94:65:2D:C7:D5:55, IP: 10.255.0.253, host name: OnePlus_5T
MAC address: 58:FB:84:8F:EE:2C, IP: 10.255.0.252, host name: DESKTOP-C2IH9JK
MAC address: 30:07:4D:A4:48:93, IP: 10.255.0.251, host name: Galaxy-S8
MAC address: 00:0C:42:F9:97:18, IP: 10.255.0.3, host name: Cafe
MAC address: E4:8D:8C:17:D7:36, IP: 10.255.0.248, host name: MikroTik
MAC address: 00:08:9B:F8:6A:05, IP: 10.255.0.5, host name: NASF86A05
MAC address: 18:DB:F2:15:57:C8, IP: 10.255.0.99, host name: AIR007027
MAC address: DC:9F:DB:80:9D:1A, IP: 10.255.0.11, host name: AirCam
MAC address: F0:23:B9:42:B4:AA, IP: 10.255.0.12, host name: H.VIEW
MAC address: CC:2D:E0:81:0E:2F, IP: 10.255.0.2, host name: MikroTik
MAC address: 98:29:A6:46:97:03, IP: 10.255.0.250, host name: LAPTOP-UNJMN524
[admin@MikroTik] >
```

The scripts - where? - other places



What can we do?

```
put -- prints argument on the screen
queue -- Bandwidth management
quit -- Quit console
radius -- Radius client settings
redo -- Redo previously undone action
resolve -- perform a dns lookup of domain name
return -- return value from function
routing --
set -- Change item properties
snmp -- SNMP settings
special-login -- Special login users
system --
terminal -- commands related to terminal handling
time -- returns time taken by command to execute
toarray -- convert argument to array value
tobool -- convert argument to truth value
toid -- convert argument to internal number value
toip -- convert argument to IP address value
toip6 -- convert argument to IPv6 address value
tonum -- convert argument to integer number value
tool -- Diagnostics tools
tostr -- convert argument to string value
totime -- convert argument to time interval value
typeof -- return type of value
undo -- Undo previous action
user -- User management
while -- executes command while condition is true
export -- Print or save an export script that can be used
```

What can we do? - the magic :commands

```
:for i from=440 to=880 step=40 do={
  :put “Now beeping at $i MHz”;
  :beep frequency=$i length=1s;
  :delay 1s;
}
```

The :commands controlling the flow

- :if
- :for
- :foreach
- :do … while
- :while … do
- :delay
- :return

The :commands working on variables

- :local
- :global
- :set
- :typeof
- :tonum, :toarray, :tobool, :tostr

The :commands interacting with user

- :put
- :log
- :beep
- :blink

The :commands working on strings

- :find
- :pick
- :len

```
:local text “abcde”
:put [:pick $text 1 [:find $text “d”]]
```

bc

Other useful RouterOS commands

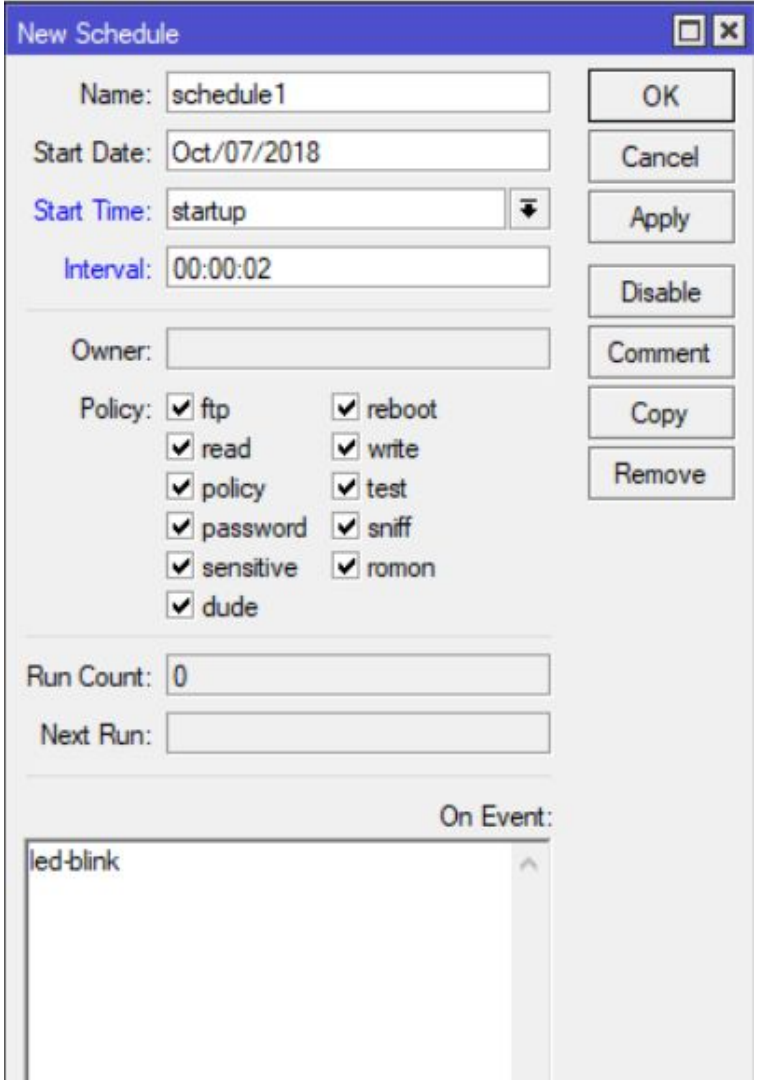
- /tool e-mail send
- /tool sms send
- /tool fetch
- /ping
- /file get … contents
- /file set … contents=…
- /tool snmp-get

How can we run a script?

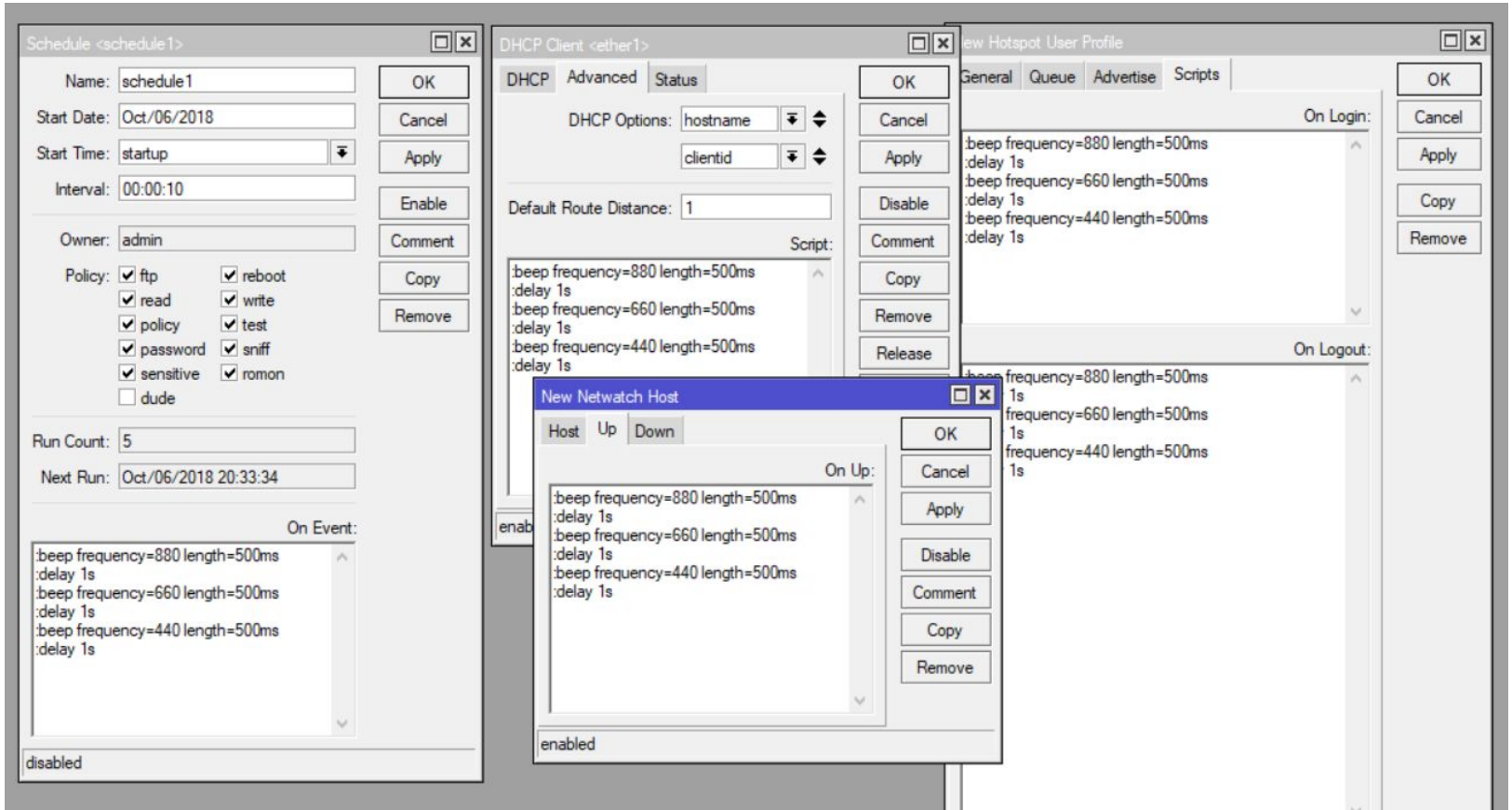
Our example script

```
:if ([/system leds get [find] type]="off") do={
  /system leds set [find] type=on;
} else={
  /system leds set [find] type="off";
}
```

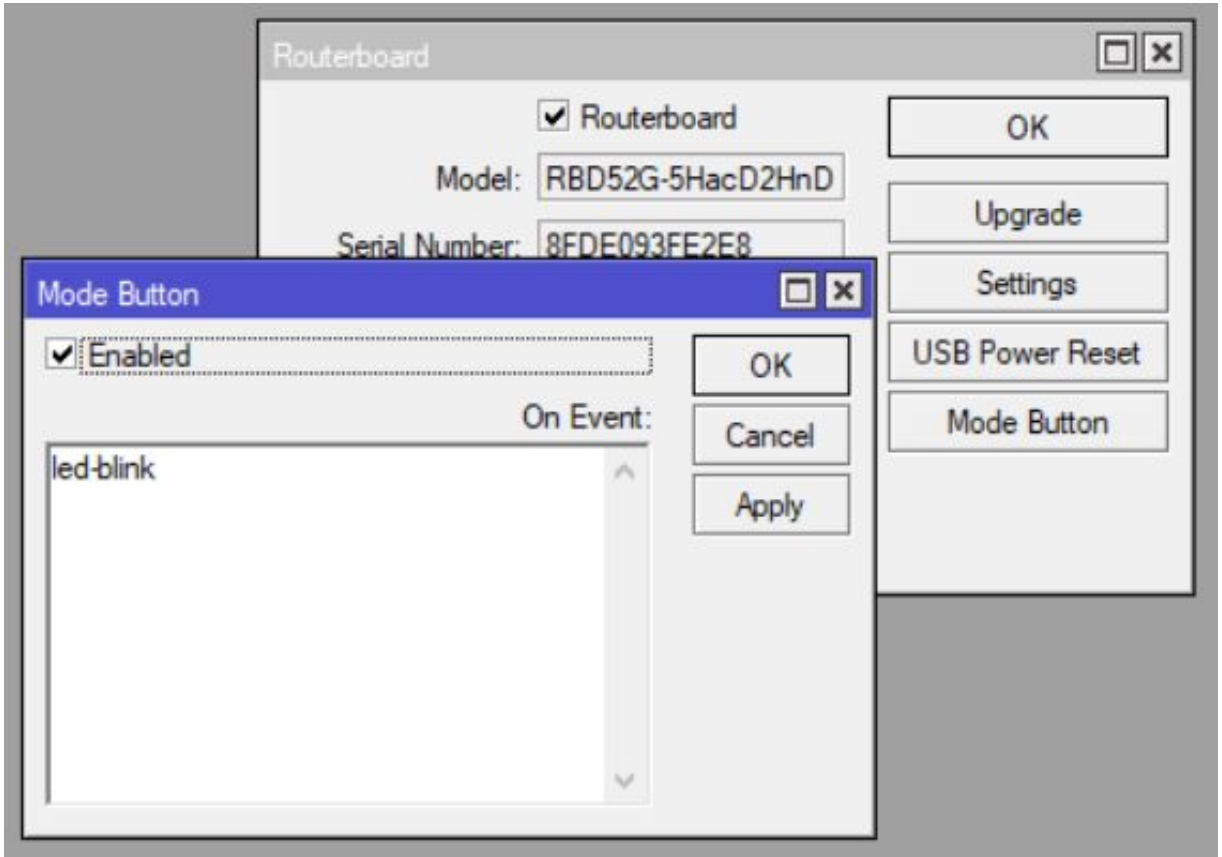
How can we run a script?
-> scheduler



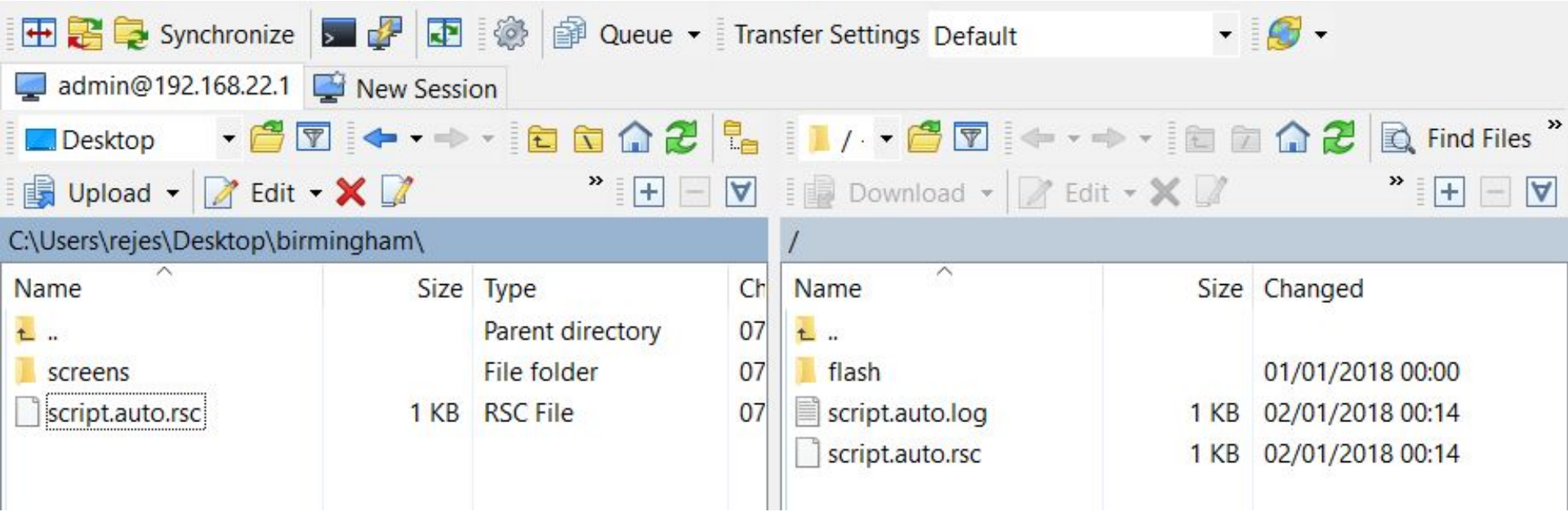
How can we run a script? -> triggers



How can we run a script? -> mode button

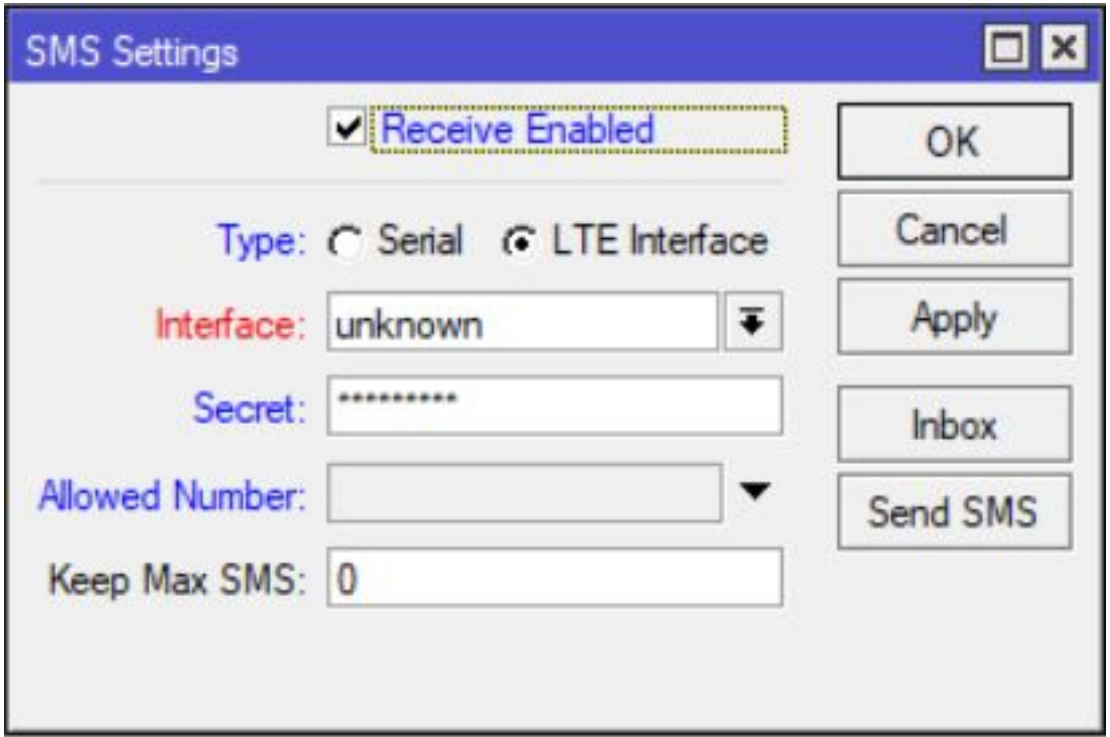


How can we run a script? -> FTP upload file**.auto.rsc**



How can we run a script? -> SMS to the router

:cmd SECRET script NAME



How can we run a script? -> SNMP GET or SET

- We need SNMP community with write access (even for GET)
- We need to find the Script OIDs with snmpwalk
- Script can report a value with :return (string only)

```
$ snmpwalk -v2c -cpublic 192.168.88.1 1.3.6.1.4.1.14988.1.1.8
iso.3.6.1.4.1.14988.1.1.8.1.1.2. 1 = STRING: "script1"
iso.3.6.1.4.1.14988.1.1.8.1.1.2. 2 = STRING: "script2"
iso.3.6.1.4.1.14988.1.1.8.1.1.3.1 = INTEGER: 0
iso.3.6.1.4.1.14988.1.1.8.1.1.3.2 = INTEGER: 0
```

How can we run a script? -> SNMP GET

```
[admin@MikroTik] > tool snmp-walk address=127.0.0.1 community=private version=2c
oid=1.3.6.1.4.1.14988.1.1.8
OID                                 TYPE                VALUE
1.3.6.1.4.1.14988.1.1.8.1.1.2.1 octet-string     led-blink
1.3.6.1.4.1.14988.1.1.8.1.1.2.2 octet-string     exp
1.3.6.1.4.1.14988.1.1.8.1.1.3.1 integer          0
1.3.6.1.4.1.14988.1.1.8.1.1.3.2 integer          0

[admin@MikroTik] > tool snmp-get address=127.0.0.1 community=private version=2c
oid=1.3.6.1.4.1.14988.1.1.18.1.1.2.1
OID                                 TYPE                VALUE
1.3.6.1.4.1.14988.1.1.18.1.1... octet-string     The LED is now ON\n

[admin@MikroTik] >
```

Variables

Using variables

- **:local x** - variable **$x** visible only inside this “scope”
- **:global x** - variable **$x** visible everywhere (in the System Environment”)

- **:local x 1** - setting the variable value when initializing
- **:set $x 1** - setting the variable name anywhere else

Variables - arrays

```
:foreach lease in=[/ip dhcp-server lease find] do={
  :local mac [/ip dhcp-server lease get $lease mac-address];
  :local name [/ip dhcp-server lease get $lease host-name];
  :local ip [/ip dhcp-server lease get $lease address];
  :put "MAC address: $mac, IP: $ip, host name: $name"
}
```

Variables - custom arrays

```
:local colors [:toarray “”]
:set ($colors->”sun”) “yellow”
:set ($colors->”sky”) “blue”
:set ($colors->”grass”) “green”

:put “The color of the grass is:”
:put ($colors->”grass”)
```

Variables - custom arrays

```
:foreach element,color in=$colors do={
  :put “$element is $color”
}
```

```
grass is green
sky is blue
sun is yellow
```

Functions

Functions - how to define them

```
:global function do={
  :return "This is the result!"
}
```

Functions - how to run them

```
[admin@MikroTik] > $function
[admin@MikroTik] >
[admin@MikroTik] > :put [$function]
This is the result!
[admin@MikroTik] >
```

Functions - how NOT TO run them

```
[admin@MikroTik] > :put $function
;(eval / (eval /returnvalue=This is the result!))
[admin@MikroTik] >
```

We need to RUN the function.
:put $function - wrong!
:put [$function] - right!

Functions - how to pass arguments

```
:global exp do={
  :local result 1;
  :for i from=1 to=$2 do={
    :set $result ($result*$1);
  }
  :return $result
}

:put [$exp 2 8]
```

Functions - running them with arguments

```
[admin@MikroTik] > :put [$exp 2 8]
256
[admin@MikroTik] > :put [$exp 10 9]
1000000000
[admin@MikroTik] >
```

Functions - and the local/global scopes

- Functions can be defined as local
- Better to define functions as global
- Functions used by other functions NEED TO be defined as global

```
:global function1 do={...}

:global function2 do={
  :global function1;
  ... (using [$function1])
}
```

```
:local function1 do={...}

:local function2 do={
  :local function1;
  ... (using [$function1])
}
```

Functions - how I use them

```
:global pushover do={
:global urlEncode;
  :if ([:typeof $message]!="nothing") do={
    :local api "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx";
    :local user "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxx";
    :local urlmessage [$urlEncode $message];
    :local string "token=$api&user=$user&message=$urlmessage";
    /tool fetch mode=https url="https://api.pushover.net/1/messages.json"
http-method=post http-data="$string";
  }
}
```

```
$pushover message=”There is a problem with the router!”
```

Functions - something special

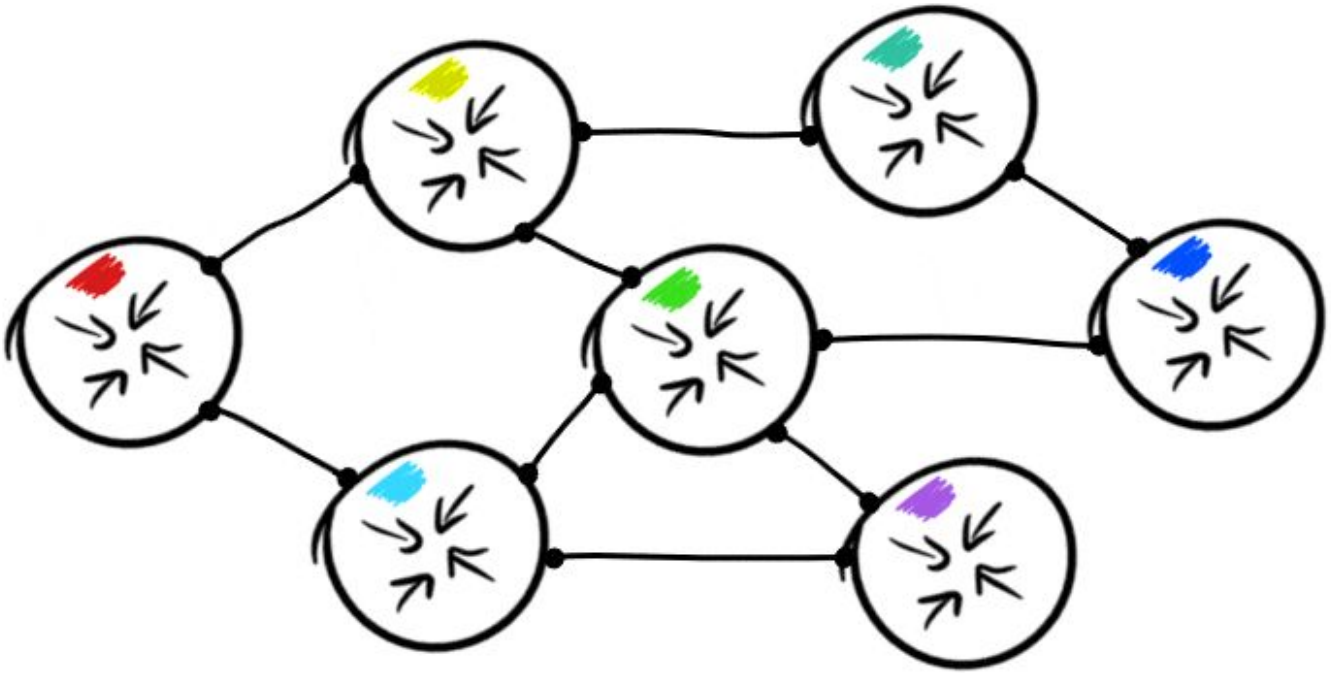
```
:global input do={
  :return
}

:put “Please provide the value for x:”
:local x [$input]
:put “Please provide the value for y:”
:local y [$input]
:put “$x*$y=$($x*$y)”
```

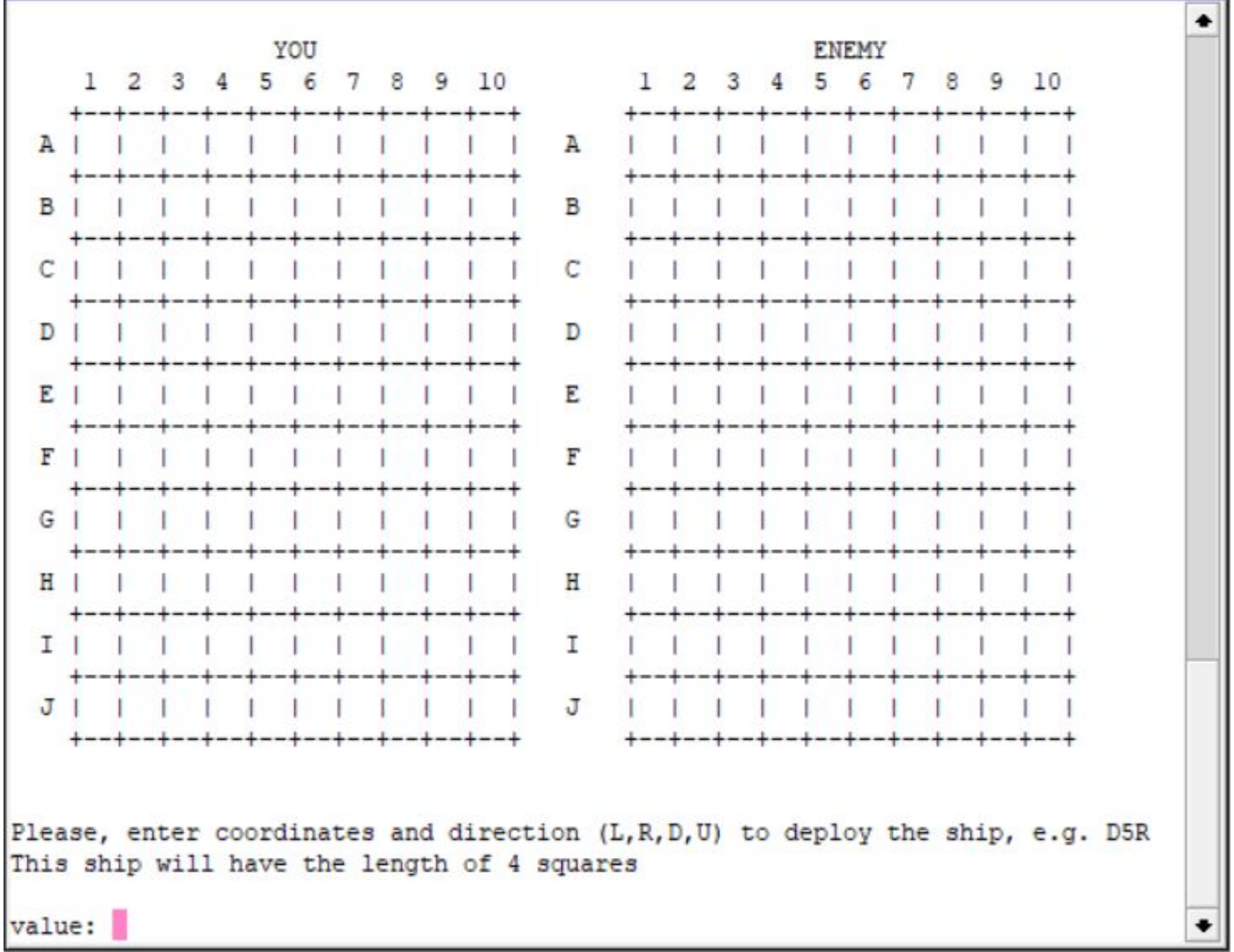
Functions - something special

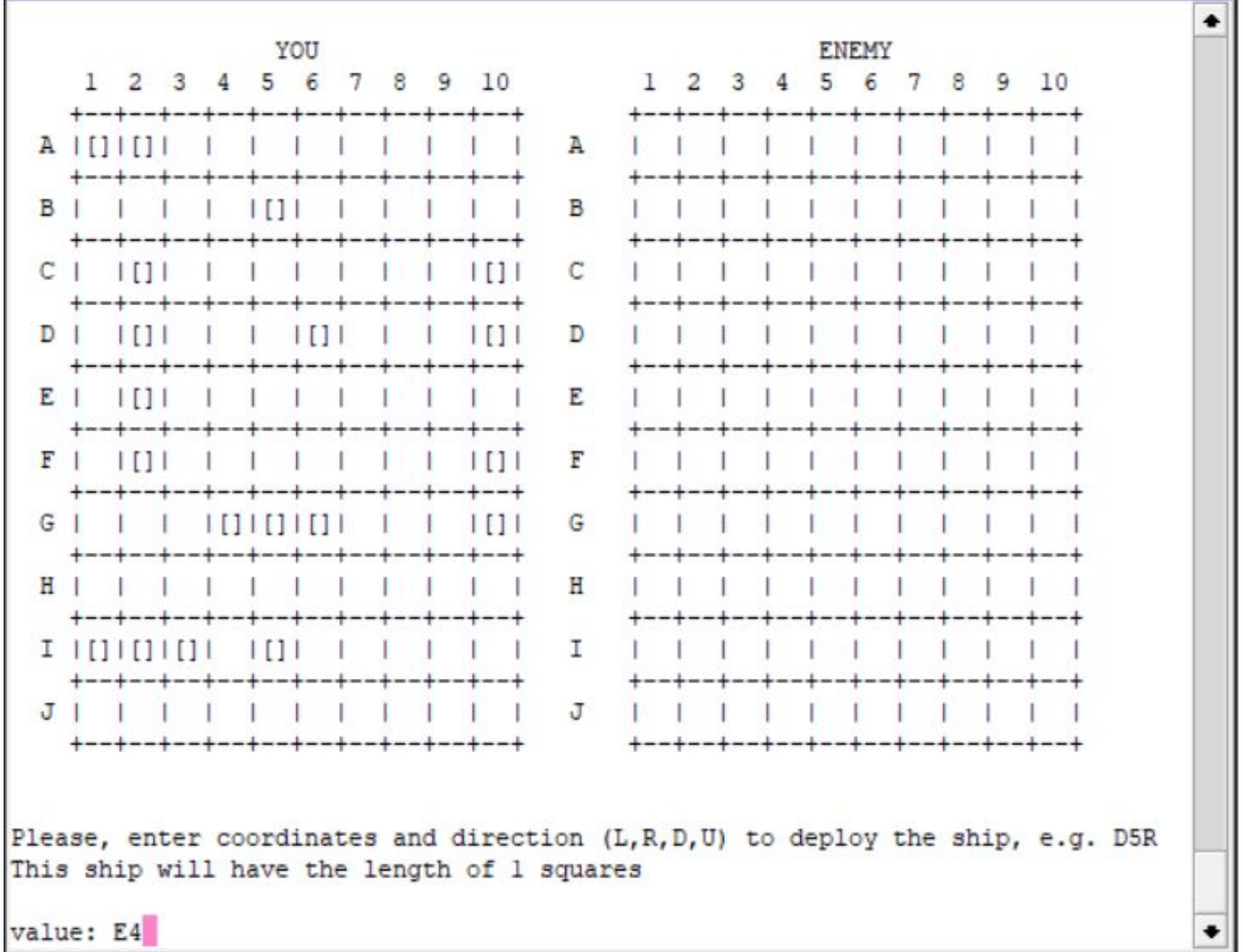
```
[admin@MikroTik] > system script run multiplication
Please provide the value for x:
value: 4
Please provide the value for y:
value: 9
4*9=36
[admin@MikroTik] >
```

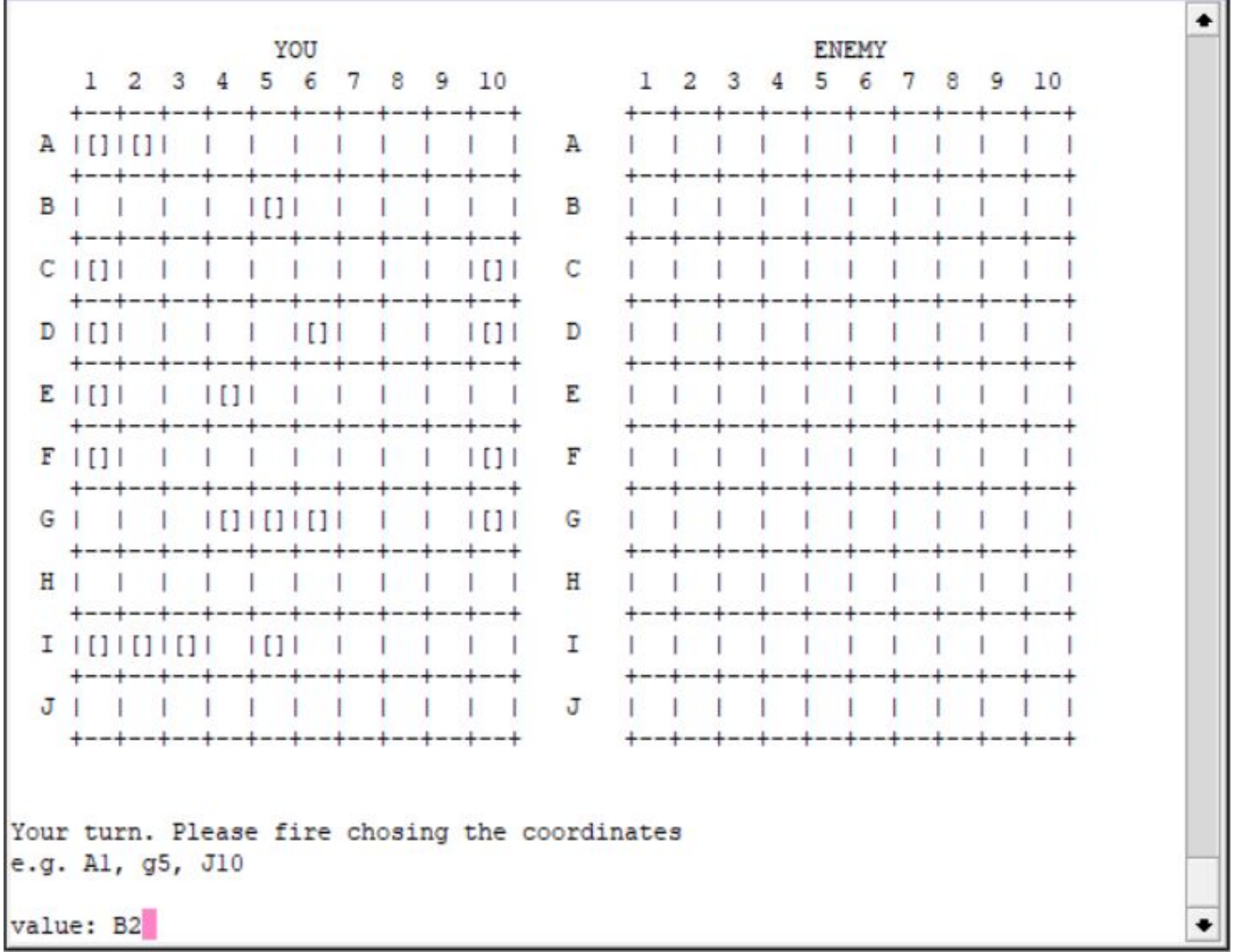
Playing battleships over BGP

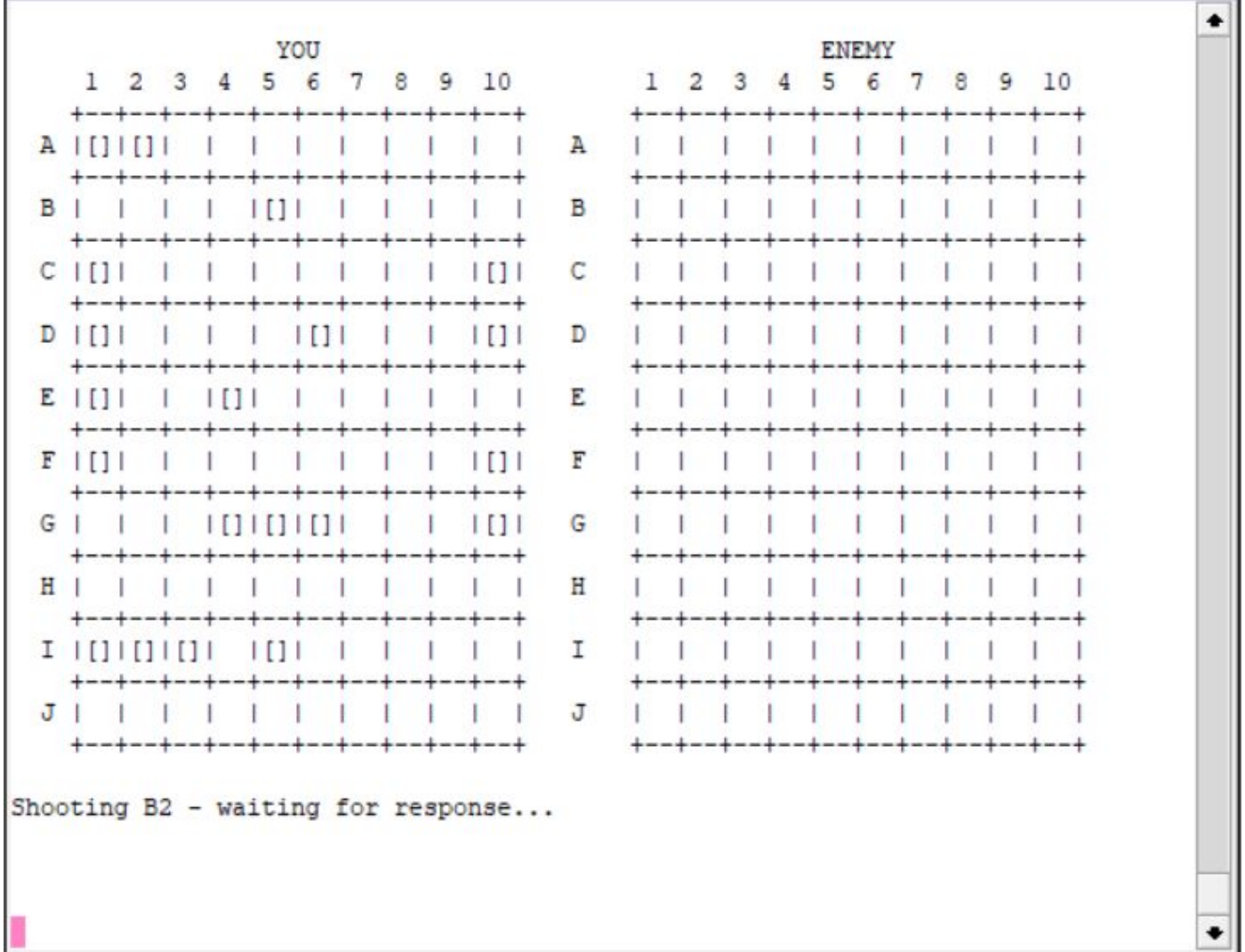
- Introduced by **Ben Cox**: https://blog.benjojo.co.uk/post/bgp-battleships

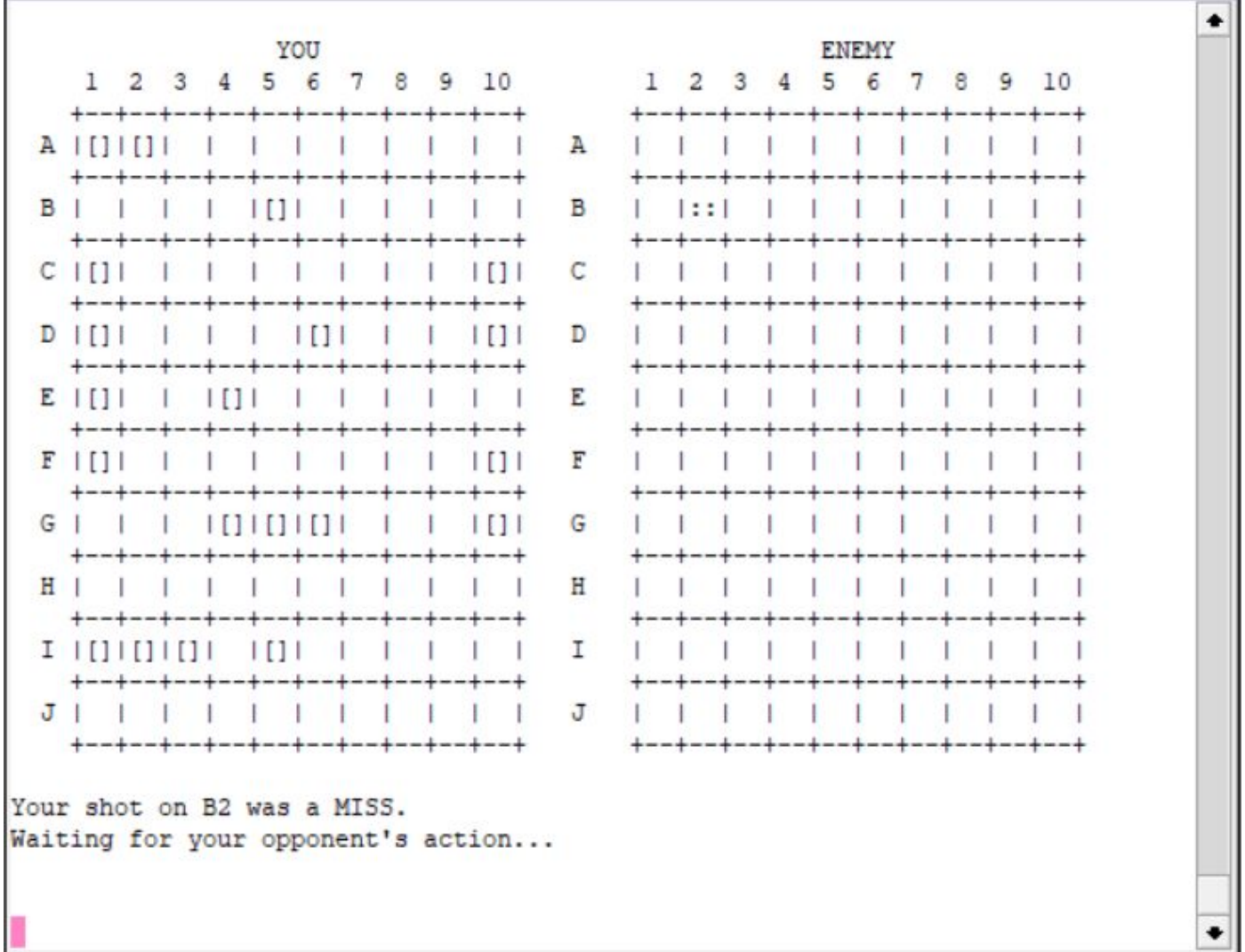


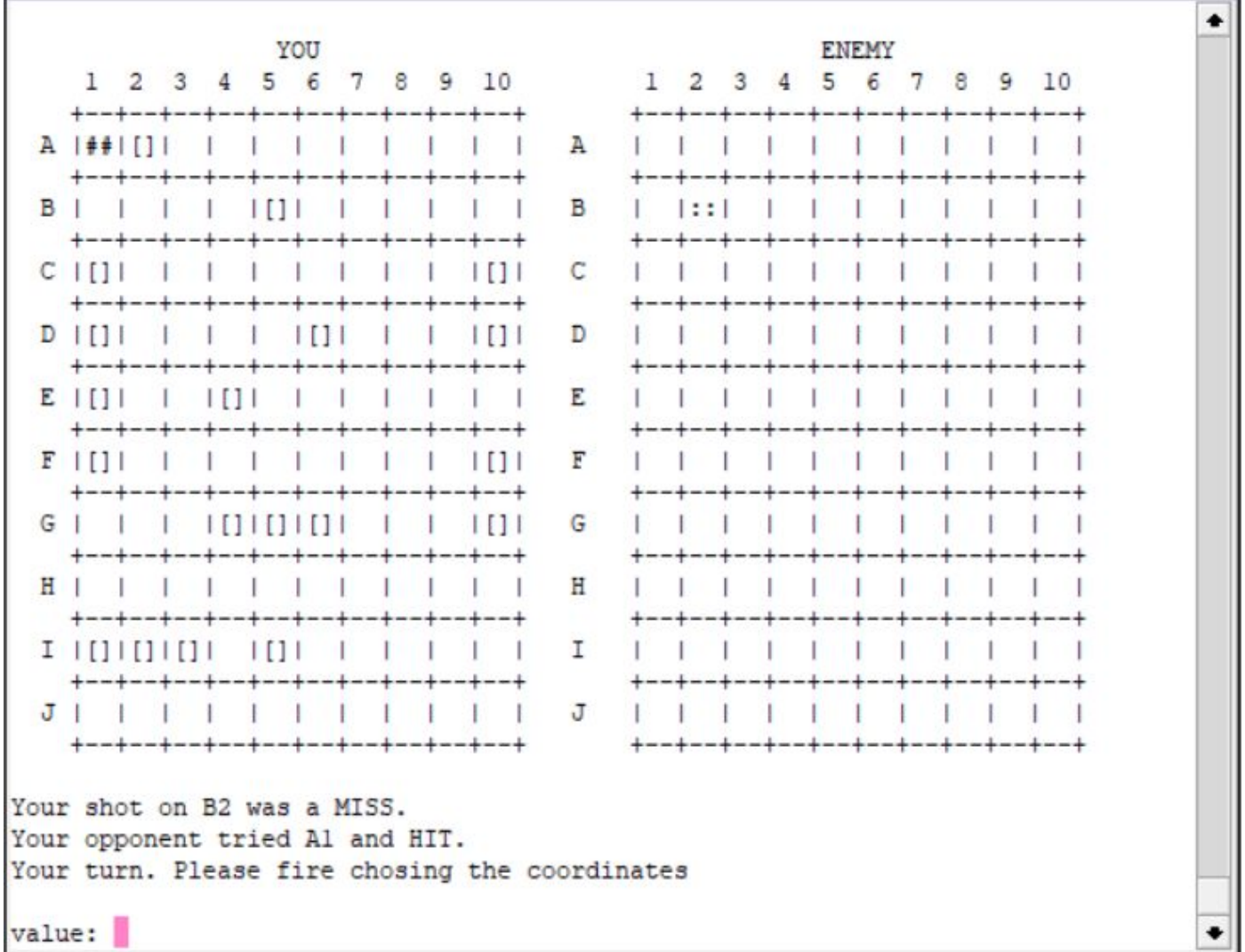

YOU
ENEMY
1 2 3 4 5 6 7 8 9 10
A
B
C
D
E
F
G
H
I
J
Please, enter coordinates and direction (L,R,D,U) to deploy the ship, e.g. D5R
This ship will have the length of 4 squares
value:

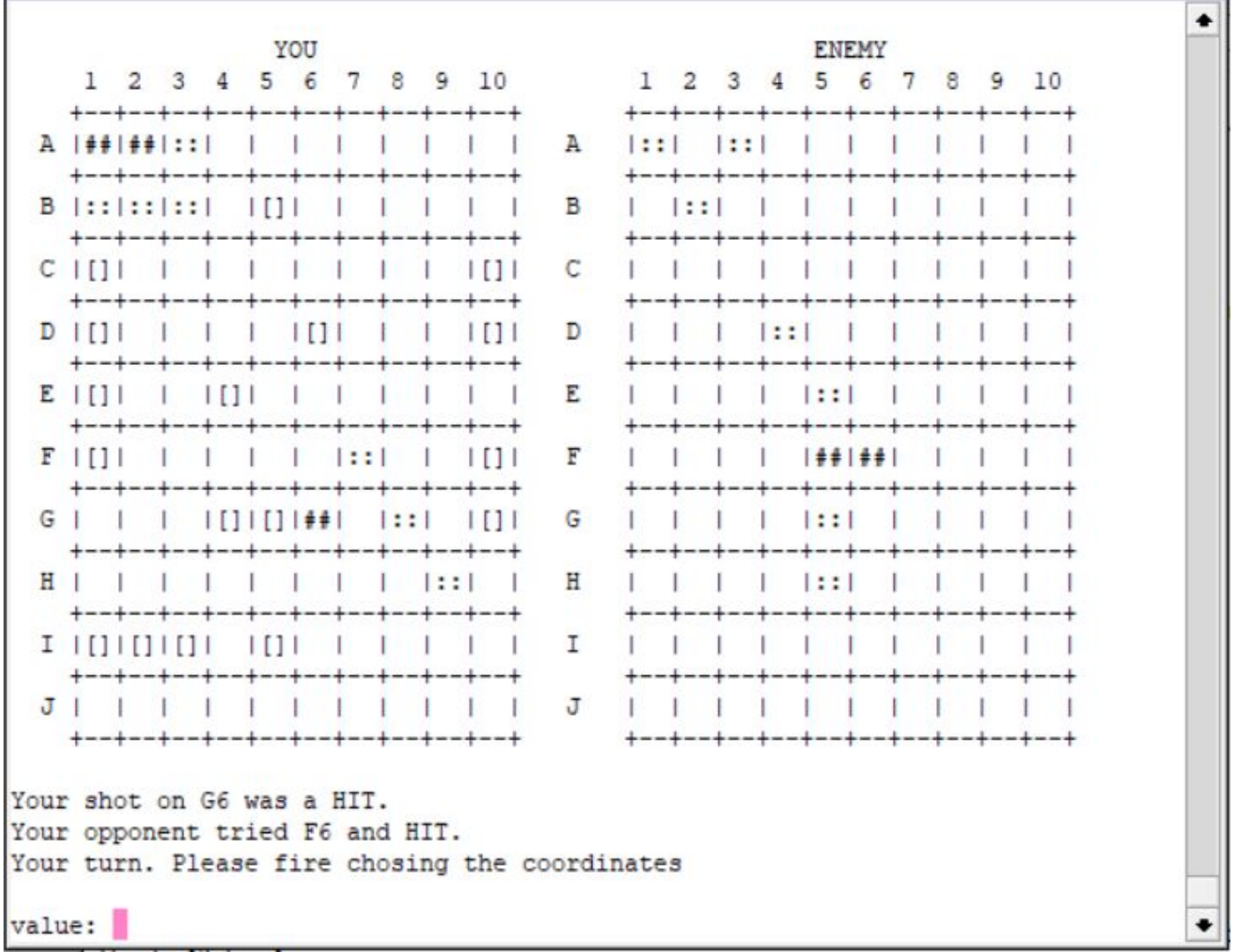

YOU
ENEMY
1 2 3 4 5 6 7 8 9 10
A
B
C
D
E
F
G
H
I
J
Please, enter coordinates and direction (L,R,D,U) to deploy the ship, e.g. D5R
This ship will have the length of 1 squares
value: E4

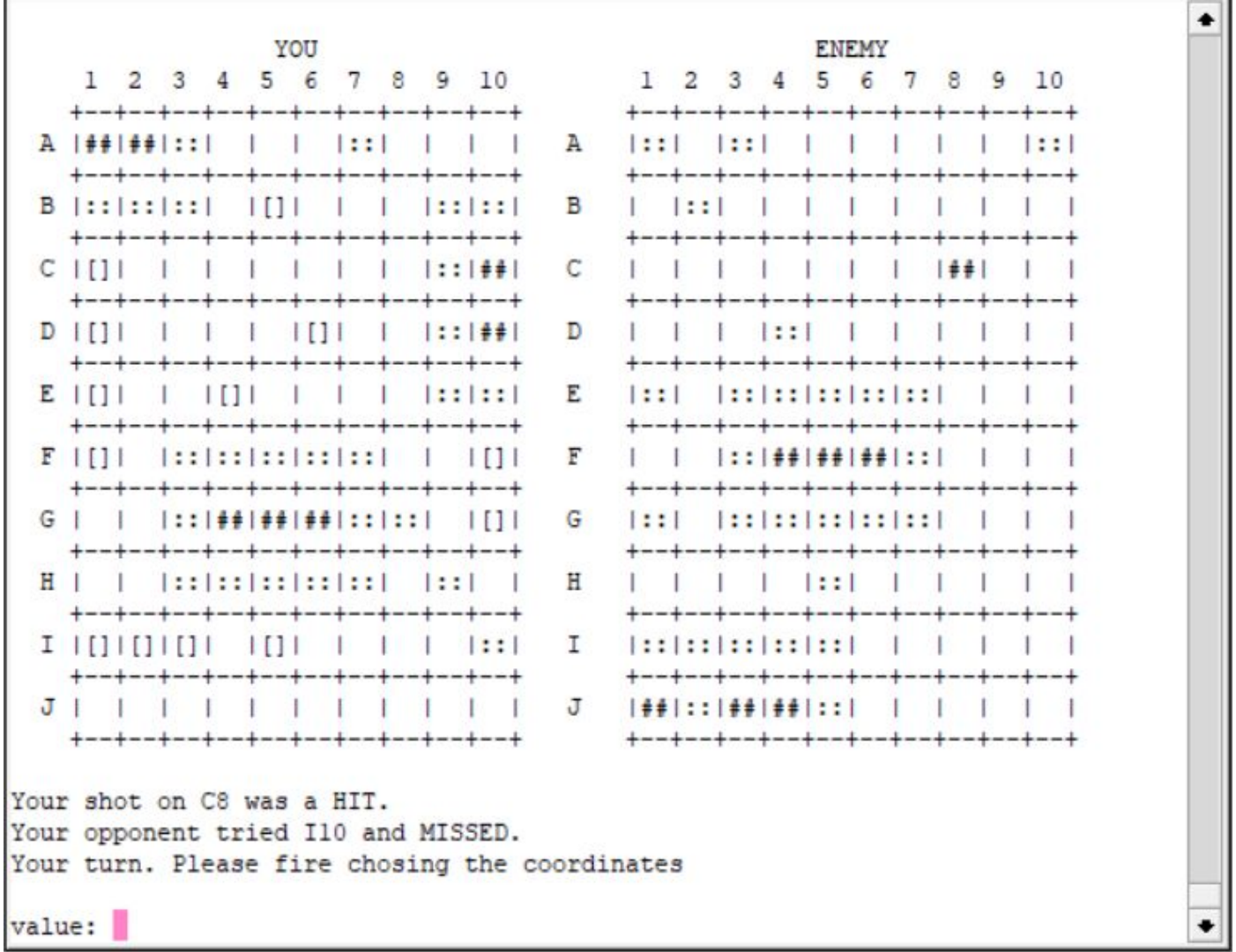

YOU
ENEMY
1 2 3 4 5 6 7 8 9 10
A
B
C
D
E
F
G
H
I
J
Your turn. Please fire chosing the coordinates
e.g. A1, g5, J10
value: B2

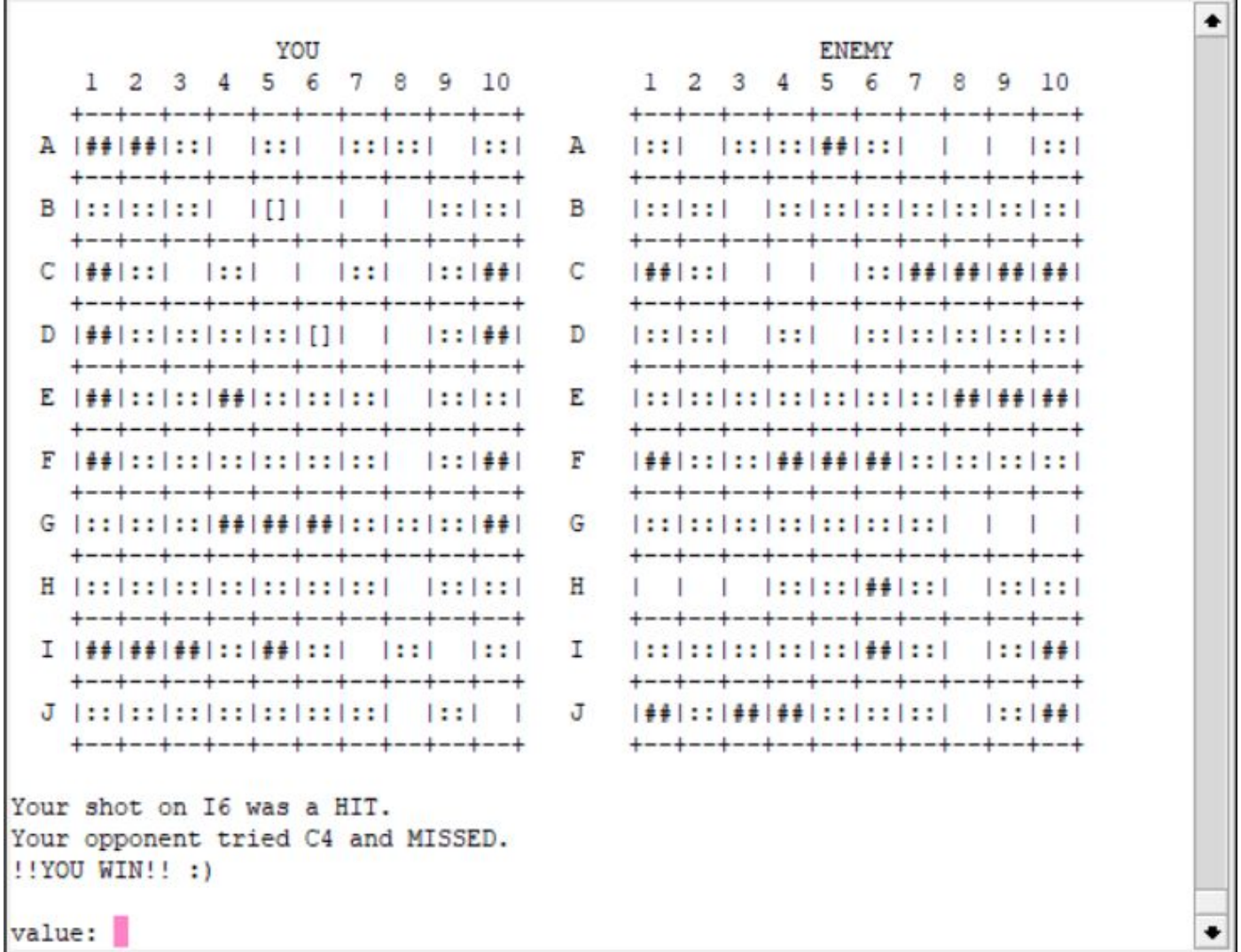

YOU
ENEMY
1 2 3 4 5 6 7 8 9 10
A
B
C
D
E
F
G
H
I
J
Shooting B2 - waiting for response...


YOU
1 2 3 4 5 6 7 8 9 10
A [][]
B []
C [] []
D [] []
E [] []
F [] []
G [][][] []
H
I [][][] []
J
ENEMY
1 2 3 4 5 6 7 8 9 10
A
B ::
C
D
E
F
G
H
I
J
Your shot on B2 was a MISS.
Waiting for your opponent's action...


YOU
1 2 3 4 5 6 7 8 9 10
A |##|[]| | | | | | | | |
B | | | | |[]| | | | | |
C |[]| | | | | | | | |[]|
D |[]| | | | |[]| | | |[]|
E |[]| | |[]| | | | | | |
F |[]| | | | | | | | |[]|
G | | | |[]|[]|[]| | | |[]|
H | | | | | | | | | | |
I |[]|[]|[]| |[]| | | | | |
J | | | | | | | | | | |
ENEMY
1 2 3 4 5 6 7 8 9 10
A | | | | | | | | | | |
B | |::| | | | | | | | |
C | | | | | | | | | | |
D | | | | | | | | | | |
E | | | | | | | | | | |
F | | | | | | | | | | |
G | | | | | | | | | | |
H | | | | | | | | | | |
I | | | | | | | | | | |
J | | | | | | | | | | |
Your shot on B2 was a MISS.
Your opponent tried A1 and HIT.
Your turn. Please fire chosing the coordinates
value:


YOU
ENEMY
Your shot on G6 was a HIT.
Your opponent tried F6 and HIT.
Your turn. Please fire chosing the coordinates
value:


YOU
ENEMY
Your shot on C8 was a HIT.
Your opponent tried I10 and MISSED.
Your turn. Please fire chosing the coordinates
value:



Your shot on I6 was a HIT.
Your opponent tried C4 and MISSED.
!!YOU WIN!! :)

value:

Questions?