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## Introduction

FindVirus is a program which you use to detect and remove viruses. Used manually, or scheduled to run <u>automatically every day</u>, it provides a good measure of protection.

However, FindVirus is only one of the modules of the Dr Solomon's Anti-Virus Toolkit, which is <u>available</u> <u>as an upgrade</u> from <u>Dr Solomon's</u>. The other modules of the Toolkit include WinGuard, which is a virus detector that works constantly in the background. It intercepts viruses automatically to prevent them spreading, and can optionally remove viruses.

Another advantage of upgrading to the full Toolkit is that it can be supported with update information, so that its detection capability covers the latest viruses (which are currently discovered at a rate of 300 to 350 a month).

# Main screen

Button	What does it do?	Click for more
Scan	click to scan any disk(s) you have selected in the drive list above.	More
Disinfect	click to disinfect any disk(s) you have selected in the drive list above.	<u>More</u>

# File menu

 Option
 What does it do?
 Click for more

Exit quits Dr Solomon's Anti-Virus More

### Exit

What does it do?

#### Click for more

Scan options

Quits Dr Solomon's Anti-Virus. Any changes you have made in the scan options will be saved when you exit.

Exit is found under the File Menu

## Scan menu

Select the required option. If you wish to change any scan settings select 'Options' before selecting a scan option.

for more

Option	What does it do?	Click
Drive	this will scan a selected drive(s). In the dialog use Shift + Click to select more than one drive.	
Directory	this will scan a selected directory. Select a directory in the dialog. Only one directory at a time can be scanned.	
File	this will scan a selected file. Select a file in the dialog. Only one file at a time can be scanned.	
Options	this allows you to configure scan settings other than the default ones.	<u>More</u>

If a virus is found you will be notified immediately and given the option of <u>disinfecting</u> the file.

# Scan options

Option	What does it do?	Click for more
Also scan	you can select to scan for unknown viruses, data (all) files and compressed files.	More
Reporting options	you can also scan for unknown viruses and have a report sent to printer or file.	More
If file cannot be disinfected	you can either rename or delete a file if it cannot be disinfected.	<u>More</u>

Scan menu Main Screen

# Also Scan

Option	What does it do?	Click for more
For unknown viruses	will use the <u>Advanced Heuristic Analyzer</u> to search for new viruses not yet recorded in our database. This will, however, increase the scan time.	
Data files	will scan all files regardless of extension. This is usually only necessary if you are dealing with an outbreak of a virus. There is no need to do this in a routine scan. Macros are scanned by default.	
Scan compressed files	will scan inside compressed files which have the extensions listed next to this function. This will, however, increase the scan time.	<u>Disinfecting</u> compressed files

# **Reporting Options**

Option	What does it do?
Report to printer	selecting this box causes FindVirus to output the report to a printer.
	Ensure that your printer is switched on.
Report to file	the file has a default name of FINDVIRU.REP and is stored in the 'C:\
	Program files\ Dr Solomon's\Anti-Virus' folder.
	You can change the folder and the file name by clicking 'Browse'.

# If file cannot be cleaned

Option	What does it do?
Rename infected files	this will change the first letter of the file extension to 'V' (e.gCOM would change to .VOM) and is the default setting. If an unknown virus is found please send it to our <u>Technical Support Department</u> . <b>Delete the infected file as soon as possible.</b>
Delete infected files	use this to delete any files which cannot be disinfected. Dr Solomon's Anti-Virus deletes the file in such a way that it cannot be undeleted.
Deleting infected files	Unknown virus

# **Disinfect menu**

Option	What does it do?
Drive	will perform a complete check and disinfect any files on the selected drive(s). This will check all files except for compressed files. Shift + Click to select more than one drive
Directory	will perform a complete check and disinfect any files on the selected directory. This will check all files except for compressed files. Only one directory at a time can be scanned.
File	will perform a complete check and disinfect any file. This will check any file except for compressed files. Only one file at a time can be scanned.

# How an infected file which cannot be disinfected is dealt with is decided in the <u>scan options</u> configuration.

More on Disinfecting

# Info menu

This gives access to the <u>Virus Encyclopedia</u> for information on the various viruses.

# **Right-click scans**

When in the Explorer you can start scans using the right hand mouse button. Right-click on the folder or file you wish to scan and select 'FindVirus...' from the menu. The scan now proceeds as normal.

# Virus Encyclopedia

The Virus Encyclopedia holds explicit and offensive language which is contained within virus messages.

The Virus Encyclopedia is in a standard Windows help format. On starting the encyclopedia you see a list of virus names; click on a virus name to see its description. You can use the 'Search' button to find a specific virus in the list.

The description includes details such as whether the virus is polymorphic, and whether it uses stealth.

The Virus Encyclopedia is accessed from the Info menu.

# If you find a new/unknown virus

There are two occasions when you could get a new or unknown virus message on your screen:

- a possible new variant of a known virus;
- a completely new virus (found by <u>Advanced Heuristics Analyzer</u> in a FindVirus scan).

By default the infected file is saved with a change to the extension. The first letter to the extension is changed to 'V', e.g. FILE.COM will change to FILE.VOM.

#### What to do

- Don't panic.
- Don't be in a hurry.
- Work systematically.

#### If the unknown virus is on a floppy disk:

We recommend that you send the disk to our Technical Support department. The address is found in the 'Customer Support and Services' chapter in the manual.

#### If the unknown virus is on the hard disk:

- 1. Format a floppy disk in the infected computer.
- 2. Copy any infected files to that floppy disk.
- 3. Remove the floppy from the drive.
- 4. Send to Dr Solomon's Technical Support.
- 5. Disinfect the hard disk using the SOS disk.

If you include a letter, explaining any symptoms you have encountered, we can often tell you what the problem is, even if it is not a virus.

Note:

We cannot reply if we receive an anonymous diskette with no return address. If possible, include a fax and phone number as well as an address.

About viruses Deleting viruses

# Cold Boot (Power-off)

How to do a Cold (Power-off) Boot:

- Switch off the computer.
   Wait 10 seconds for the power supply to reset.
   Insert the SOS disk.
- 4 Switch the computer back on again.

Virus found

# **About Viruses**

A virus is a program that copies itself without the knowledge of the computer user. Typically, a virus spreads from one computer to another by adding itself to an existing piece of executable code so that it is executed when its host code is run.

Viruses can be classified by their method of concealment. Some are called <u>Stealth Viruses</u> because of the way that they hide themselves, or <u>Polymorphic</u> because of the way they change themselves to avoid scanners.

The most common classification, however, relates to the sort of executable code which the virus attaches itself to. These are:

#### Types of viruses

Partition Viruses Boot Sector Viruses File Viruses Overwriting Viruses Macro Virus Companion Viruses Multipartite Viruses

Virus found Unknown virus

There is also a set of programs that are **related** to viruses by virtue of their intentions, appearances, or users' likely reactions: <u>Droppers</u> <u>Failed viruses</u> <u>Packagers</u> <u>Trojans</u> <u>Jokes</u> Test files

# **Stealth Viruses**

If a stealth virus is in memory, any program attempting to read the file (or disk sector) containing the virus is fooled into believing that the virus is not there.

Memory-resident viruses will not normally function under Windows 95. However, they can be active in DOS sessions or if Windows 95 is running in real mode.

There are two ways to deal with this:

\* <u>Cold Boot</u> from a clean DOS floppy, and make sure that nothing on the hard disk is executed. Run any anti-virus software from floppy diskette. Unfortunately, although this method is foolproof, relatively few people are willing to do it.

Search for known viruses in memory. All the programs in Dr Solomon's Anti-Virus do this when they are run.

# **Polymorphic Viruses**

A polymorphic virus is one that is encrypted, and the decryptor/loader for the rest of the virus is very variable. With a polymorphic virus, two instances of the virus have no sequence of bytes in common. This makes it more difficult for scanners to detect them.

Dr Solomon's Anti-Virus uses "Fuzzy Logic" techniques and the <u>Generic Decryption Engine</u> to detect these viruses.

# **Partition Sector Viruses**

The partition sector is the first sector on a hard disk. It contains information about the disk such as the number of sectors in each partition, where the bootable partition starts, plus a small program. The partition sector is also called the Master Boot Record (MBR).

Viruses can place all or part of their code in this location on a hard disk. The code in this location is the first to be executed when your computer starts up. Infecting this area allows a virus to install itself in memory before the operating system has loaded.

Since the partition sector is not part of the normal data storage area on the disk, utilities such as DEBUG will not allow access to it.

Floppy disks do not have a partition sector.

### **Boot sector viruses**

The boot sector is the first sector on a floppy diskette. On a hard disk it is the first sector of <u>a partition</u> It contains information about the disk or partition, such as the number of sectors, plus a small program.

When the computer starts it attempts to read the boot sector of a disk in drive A. If this fails because there is no disk in drive A it reads the boot sector of drive C. A boot sector virus replaces this sector with its own code and normally moves the original elsewhere on the disk.

Even a non-bootable floppy disk contains executable code in its boot sector. This displays the 'nonsystem' disk message when the computer attempts to boot from the disk. Therefore, a non-bootable floppy disk can still contain a virus and infect a computer if it is inserted in drive A when the computer starts.

### **File viruses**

File viruses append or insert themselves into executable files, typically .COM and .EXE programs, and macros.

A direct action file virus infects another executable file(s) on the disk when its 'host' executable file is run; but does not remain active in memory.

An indirect action (or TSR) file virus installs itself into memory when its 'host' is executed, and infects other files when they are subsequently accessed (most infect programs when they are run). This type of virus can also interfere, deliberately or accidentally, with the operation of other memory- resident programs. Some TSR viruses infect other programs when they are opened or copied as well as when they are run. These are known as 'fast infectors'.

On Windows 95 systems, a file virus can run whenever a DOS application is run. A handful of viruses have been written which are designed specifically to run under 32-bit operating systems like Windows 95.

Most file viruses try to go memory-resident when they run. This attempt to become memory-resident is likely to fail as memory is handled differently under Windows 95. This will severely hamper the ability of the virus to spread.

Note that under Windows 95, a virus may not have the same effect as it does under DOS. In particular, viruses will not be able to write to hard disk boot sectors and partition sectors from within the a DOS session.

# **Overwriting viruses**

Overwriting viruses overwrite all or part of the original program. As a result, the original program does not run. Overwriting viruses are not, therefore, a real problem - they are extremely obvious, and so cannot spread effectively. Overwriting viruses will run within a Windows 95 DOS session. Files infected by an overwriting virus cannot be disinfected.

#### Macro viruses

Macro viruses are now common. They can be part of documents or spreadsheets created in applications which use macro languages. Any application which uses a sufficiently complex macro language could be a target for viruses; but to date we have only seen macro-viruses for Microsoft Word for Windows, Microsoft Excel for Windows and Lotus AmiPro for Windows.

Macro viruses generally function independently of the operating system. All the macro commands required for an infection, function on all platforms. A Macro virus created on an IBM compatible can infect a file on a Macintosh, or vice versa.

# **Companion viruses**

If you have a COM file and an EXE file of the same name, DOS always runs the COM file in preference to the EXE file, if no file extension is given. Companion viruses make use of this fact by creating COM files with the same name as the legitimate EXE files, thus, ensuring that they are executed. Then the viruses pass control to the original EXE file, which runs normally. Companion viruses will run in a Windows 95 DOS session and some may be effective under Windows 95.

A path companion virus creates an infected file with the same name as an executable file and places the infected file in a directory named earlier in the path. Therefore the infected file runs in preference to the original file.

# **Multipartite viruses**

Some viruses use a combination of techniques to spread and infect executable files, boot sectors and partition sectors. These will not generally be able to spread successfully under Windows 95.

# **Droppers**

Droppers are programs that have been written to perform some apparently useful job but, while doing so, write a virus out to the disk. In some cases, all that they do is install the virus (or viruses).

A typical example is a utility that formats a floppy diskette, complete with Stoned virus installed on the <u>boot sector</u>

Droppers that attempt to spread boot sector viruses will generally not work under Windows 95.

# **Failed viruses**

Sometimes a file is found that contains a 'failed virus'. This is the result of either a corrupted 'real' virus or simply a result of bad programming on the part of an aspiring virus writer. The virus does not work - it hangs when run, or fails to infect.

Many viruses have severe bugs that prevent their design goals - some will not reproduce successfully or will fail to perform their intended final actions (such as corrupt the hard disk).

Many virus authors are very poor programmers.

# Packagers

Packagers are programs that in some way wrap something around the original program. This could be as an anti-virus precaution, or for file compression. Packagers can mask the existence of a virus inside.

# **Trojans and Jokes**

A trojan is a program that deliberately does unpleasant things, as well as (or instead of) its declared function. They are not capable of spreading themselves and rely on users copying them.

A joke is a harmless program that does what its author thinks is amusing. We include the detection of a few jokes in Dr Solomon's Anti-Virus, where people have found particular jokes that give concern or offense.

### **Test files**

Test files, in the context of viruses, are used to test and demonstrate anti-virus software such as <u>FindVirus</u>. They are not viruses - simply small files that are recognized by the software and cause it to simulate what would happen if it had found a virus. This allows users to see what happens when it is triggered, without needing a live virus.

A test file for FindVirus can be made by creating a small text file, at least 50 characters long, which has the following sequence of characters at the very beginning:

#### ZQZXJVBVT

A FindVirus scan will report the file as a 'Test File', not a virus.

Note that the test file should have an executable extension (.COM or .EXE) for this to work correctly.

# If you find a virus

- <sup>n</sup> Don't panic.
- Don't be in a hurry.
- Remove the virus using the <u>Main Screen</u> or the <u>Disinfect Menu</u>.
- If required call Dr Solomon's technical support.
- n Review anti-virus policy to try and prevent a recurrence

**Disinfect info** 

<u>Unknown virus</u>

Cannot disinfect

## Deleting files that cannot be disinfected

The safest way to delete a file that cannot be disinfected is to use the 'Delete infected files' of Dr Solomon's Anti-Virus.

- 1. Start Dr Solomon's Anti-Virus.
- 2. Under the 'Scan' menu select 'Options'.
- 3. In the 'If file cannot be disinfected' section select 'Delete infected files'.
- 4. Click 'OK'.
- 5. Select Disinfect and then the relevant drive.
- 6. The infected file will be deleted and cannot be recovered.
- 7. To double check that your computer is now clean, click 'Scan' to re-check your computer.
- 8. If all is clear exit Dr Solomon's Anti-Virus.

Virus found

# Help menu

Option	What does it do?	Click for more
Contents	will take you to the Contents of the main help menu	
Using Help	will explain how to move through a help file	More
Keyboard access	will explain how to use keyboard shortcuts instead of a mouse when using Dr Solomon's Anti-Virus.	More
About	will give you the current version of the Dr Solomon's Anti-Virus you are running. Dr Solomon's address and contact numbers are also given.	

# **Using Help**

Some help topics will have a number of hotspots (cross-references) highlighted in green and underlined.

- <sup>n</sup> To access a cross-referenced topic, select with a mouse click (the cursor changes to a hand when held over a ) or use TAB (or Shift+TAB in reverse direction) to move to the highlighted text and then press ENTER.
- <sup>n</sup> Use the scroll bar or up/down arrow keys to scroll through the text. PgUp and PgDn move through the text more rapidly.

# **Keyboard access**

In Windows 95 shortcut keys are underlined. Most options can be selected by pressing shortcut key combinations.

Key	What does it do?	
TAB	Move to next option or option group	
Shift +TAB	Move to previous option or option group	
Arrow keys	In an option group - move to next option in group	
	Elsewhere - same as TAB, Shift + TAB	
SPACE	Choose the active button or option	
F1	Help	
Alt or F10	Activate menu bar	
Alt + Down arrow	Drop down a Combo Box	
Alt + F4	Close program	
Enter	Choose the active button	
Esc	Cancel current dialog	

#### Note:

Option groups are check boxes, radio buttons and anything with a scroll bar.
#### **Detecting unknown viruses**

Heuristic analysis is a technique used for scanning a file for suspicious code. However, it is very difficult to determine what code is suspicious. The code that might be innocent in one program (for example, FORMAT.COM) might be suspect in a virus infected file.

For this reason it is necessary for heuristic analyzers to calculate how suspicious a file appears. Typically, a scoring system is implemented, and any file which has enough suspicious elements (a high enough 'score') is flagged as being a possible virus. Suspicious elements could include: undocumented DOS functions, anti-debugging techniques to avoid disassembly, the existence of an executable file search mask (\*.COM, \*.EXE) etc.

Virus experts are typically seeing on average 200 to 250 new viruses every month. With the rising popularity of computers and the dramatically increased use of the Internet, new viruses are spreading faster and further than ever before.

There are two major problems with traditional heuristic analysis techniques.

- Firstly, unless great care is taken heuristic programs could give false alarms. A false alarm can be significantly more trouble and time-consuming than a genuine virus infection.
- Secondly, heuristics are unable to detect every existing virus.

Dr Solomon's Advanced Heuristic Analysis (AHA) answers the problems inherent in traditional heuristic analyzers. Through more detailed analysis of suspect files. AHA is able to virtually eliminate the possibility of false alarms. In tests, over gigabytes of software, it has succeeded in producing ZERO false alarms.

Traditional heuristic analyzers might confuse an innocent file for an infected file when scanning for suspicious code. Dr Solomon's Anti-Virus makes a more detailed analysis of suspect files. Polymorphic viruses, in particular, use techniques not used in most programs. Therefore, the more complicated the virus author makes a <u>polymorphic</u> virus, the more obvious it is to the analyzer.

Other scanners using traditional heuristic analysis have shown detection rates of only 60%, with a 1 in a 1,000 false alarm rate. (The computer on which this document has been written contains over 5,000 files). In laboratory tests AHA has been verified as detecting in excess of 80% of new and unknown viruses, with zero false alarms.

Unknown viruses

# **Disinfecting information**

In the majority of cases Dr Solomon's Anti-Virus can reverse any damage, caused by a virus, to executable files. FindVirus removes the virus code from each infected file and restores the file to its original state. The virus code is then overwritten with zeroes to make sure that it is completely removed.

Where a virus has caused irreparable damage, FindVirus gives you the option to rename the file so that it cannot be run accidentally, or to delete the file. The file is overwritten with zeroes before it is deleted to make sure that it cannot be Undeleted.

Disinfect menu Cannot disinfect Virus found

## What is FindVirus?

FindVirus is an extremely fast scanner and is, therefore, suitable for every day use. It looks for known viruses and provides comprehensive protection when working with up-to-date drivers. These are databases containing information on known viruses.

You must update regularly for FindVirus to be completely effective, you can only do this with the full version of the Toolkit.

A <u>Test file</u> can be prepared to simulate the effect of a virus on the programs.

## **Generic Decryption Engine**

The dynamic nature of the virus world means that further advances must be made to cope with the latest viruses. The Generic Decryption Engine is one of the features which confirms Dr Solomon's position as the most technologically advanced anti-virus company in the world. Dr Solomon's were the first anti-virus company in the world to develop a generic decryption engine, first releasing it in September 1993.

The generic decryption engine followed the development of a series of virus engines, designed to produce <u>polymorphic</u> viruses. The Nuke Encryption Device (NED), for example, offers enormously high levels of polymorphism to the virus author. The engine is so polymorphic that using statistical analysis it resembles any fairly ordinary program. Statistical analysis is not enough to accurately detect (with no false alarms) viruses created with NED. Similarly, the Dark Angel's Multiple Encrypter (DAME) is impossible to detect reliably with conventional methods.

What was required was a method that would:

- n detect polymorphic viruses, 100%;
- n give zero false alarms;
- n not slow down FindVirus

The research and development team at Dr Solomon's set out to write a program that could decrypt any encrypted program. The idea was to look at the code, work out the decryption algorithm from the code, and then decrypt the virus.

n 100% IDENTIFICATION:

Once the code is decrypted, you have inside the encrypted part, a constant byte sequence which can be used for positive identification.

FUTURE PROOF:

If it is a truly general decryptor, it will work for MTE, TPE, NED, and other encryption methods.

ZERO FALSE ALARMS:

False alarms result because encrypted viruses are so variable. With a Generic Decryption Engine we are looking at something that is not variable, the decrypted bytes of the virus.

PRECISE IDENTIFICATION:

If we've decrypted the virus, we can then do an exact identification by checksumming it (in effect, taking a fingerprint).

n DISINFECT:

Precise identification and complete decryption means disinfection of the virus is possible. SPEED:

We have recorded speeds in excess of seven (7) megabytes/second. The Generic Decryption Engine will not slow down FindVirus in conventional operation. Of course, if a polymorphic virus is found during the scan there is a slight slowdown during the decryption process.

The Generic Decryption Engine produced in the Dr Solomon's virus laboratories does not need to know anything about how the NED works. The Generic Decryption Engine knows how to decrypt anything that is encrypted. Once decrypted a virus is relatively simple to identify by the constant sequence of bytes hidden by the encryption.

In its first test run the Generic Decryption Engine successfully decrypted, and detected almost every single file infected with the NED virus, Itshard. When run against a large collection of clean files it gave no false alarms.

In further tests we found that almost every encrypted virus in their collection could now be decrypted and removed. Furthermore, we found that our scanner could now perform exact repair (as the files were before infection) of viruses such as V2P6 which many other products cannot even detect reliably. Immensely Polymorphic viruses such as Bosnia, Trigger and Tremor can be detected with ease, and no false alarms.

# **Technical Support**

	U.S.A and Canada
Telephone	617-273-7495
Fax	617-273-7474
e-mail	techhelp@us.drsolomon.com
Bulletin board	617-229-8804
Mailing Address	Technical Support Dr Solomon's Software, Inc. 1 New England Executive Park Burlington MA 01803 USA

Virus found

Unknown virus

## **File Allocation Table**

The FAT is the area on the disk that contains the information about what part of the disk belongs to which file. If the FAT is zeroed or corrupted, then the hard disk is like the pages of a book, without any binding, in a random order, and no page numbers.

A number of viruses zero, overwrite, or (much worse) make small changes to the FAT.

# About Dr Solomon's Anti-Virus

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# **Disinfecting compressed files**

Viruses within compressed and archived files cannot be disinfected without the file first being decompressed. To disinfect compressed files, decompress to a temporary directory and use the 'Disinfect' function to remove the virus.

#### **Automatic Daily Scanning**

There is a launch program - 'FVLAUNCH.EXE' - to implement daily virus scanning.

To activate FVLAUNCH, create a program item for it in the StartUp group (Windows 3.x), or create a short cut for it in the StartUp folder (Windows 95). To de-activate FVLAUNCH, remove its program item or short cut.

Each time you boot up the computer FVLAUNCH checks whether a virus scan has already been performed that day. If a scan has not been performed FVLAUNCH starts a scan, which checks the local drives.

Before the scan starts you may see the licence agreement prompt. If you do see this prompt you can check the 'Don't show again' box.

If you have previously checked the 'Don't show again' box the scan starts immediately.

You see an indication of the progress of the scan in the Task Bar. A report screen is displayed when the scan has completed.

## **Upgrade Order Form**

То:	C/E056
Name	
Company	
Department	
Street	
City, State, Zip/Country	
Please complete the f	ollowing:
Please send me the D for (please check one	r Solomon's AntiVirus Toolkit operating system)

Windows 95	
Windows 3.x	
Windows NT	
Netware	

1. Registration fee

Please contact your local distributor for the current price

- 2. Shipping
- 3. Sales tax, if applicable \_\_\_\_\_

TOTAL of 1,	2 and 3	

Please indicate payment method:

Check/M.O.	Credit card	
Credit Card No		 Expires

Signature \_\_\_\_\_ Date \_\_\_\_\_

Check here \_\_\_\_\_ if you require 5.25" media.

We accept corporate purchase orders--please call your local distributor for details.

In the USA, you can telephone your order to 800-310-9078 or fax this form to 617-238-0851.

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or on the World Wide Web http:/www.drsolomon.com/ or Compuserve Go Drsolomon

#### Distributors

Dr Solomon's Anit Virus is available from a number of sources. If your country does not appear on this list, or if you cannot contact your local distributor, please contact Dr Solomon's in the <u>United Kingdom</u>, in the <u>USA</u> or in <u>Germany</u>.

North America <u>Argentina</u> Australia <u>Austria</u> **Bahrain Baltic Republics** Bangladesh Belgium Belorussia <u>Bolivia</u> Brazil <u>Canada</u> Central America <u>Chile</u> China Colombia **Cyprus** Czech Republic **Denmark** Egypt Ecuador <u>Estonia</u> Ethiopia Finland France Germany <u>Ghana</u> Greece <u>Guatamala</u> Honduras Hong Kong India <u>Indonesia</u> <u>Iran</u> **Ireland** <u>Isreal</u> Italy Ivory Coast <u>Japan</u> <u>Kenya</u> Korea Kuwait Latvia Luxembourg <u>Malaysia</u> Malta **Mexico** Nepal Netherlands

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