

# Getting Started With Picat

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*The following instructions are for Windows. They also apply to Unix systems, except that the archive name is different, the executable is named `picat`, the way to open a command terminal is different, and the way to include the executable in the default path is different.*

## Install Picat

1. Download the zip or gz archive file for from: <http://picat-lang.org>.
2. Extract the files of the archive to a directory, say `c:\` on Windows. The file named `picat.exe` is the executable of the Picat system.
3. For convenience, add the directory that contains `picat.exe` to the environment variable `PATH` so that you can start Picat from any working directory.

## Start and Quit Picat

1. Open an OS terminal. This can be done by selecting `Start->Run` and typing `cmd`, or selecting `Start->Programs->Accessories->Command Prompt`.
2. Change the working directory. In the following, the working directory is assumed to be `c:\Picat\work\`. The command DOS `mkdir` can be used to create directories.
3. Type `picat` to start the system. If Windows does not recognize the command, then you need to edit the environment variable `PATH` or type the full path of the executable `picat.exe`. Once Picat is started, the system shows the prompt `Picat>` and is ready to accept queries.
4. Type `help` to see the help information.
5. Type `halt` or `ctrl-d` (control-d) to exit the system.

```
c:\Picat\work>picat
Picat 2.1, (C) picat-lang.org, 2013-2017.
Type 'help' for help.
Picat> println("Hello World!")
Hello World!

yes

Picat> X = 1+2
X = 3
yes

Picat> halt
```

## Load and Run Programs

For the sake of demonstration we'll create a Picat function to sum the even-valued terms of the Fibonacci sequence whose values do not exceed four million.

```
main =>
  S = 0,
  I = 1,
  F = fib(I),
  while (F <= 4000000)
    if (F mod 2 == 0) then
      S := S+F
    end,
    I := I+1,
    F := fib(I)
  end,
  printf("Sum of the even-valued terms is %w%n",S).
```

```
main([A1]) =>
  printf("fib(%s)=%w%n",A1,A1.to_integer().fib()).
```

```
table
fib(1) = 1.
fib(2) = 2.
fib(N) = fib(N-1)+fib(N-2).
```

1. Create a file named `fib.pi` in the directory `c:\Picat\work\`.
2. Start Picat.
3. Compile and load the file using `cl(fib)`.
4. Type `main` to run the program.
5. You can also call the function `fib` by typing a query such as `X=fib(100)`.

```
Picat> cl(fib)
Compiling:: fib.pi
fib.pi compiled in 0 milliseconds
loading...

yes

Picat> main
Sum of the even-valued terms is 4613732

yes

Picat> X = fib(100)
X = 573147844013817084101
yes
```

## Debug

1. Start Picat.
2. Enable debug mode with `debug`.
3. Compile and run the file using `cl(fib)`.
4. Type `main` to run the program.
5. At the entrance and exit of each call, the debugger displays the call and waits for a command. For the available debugging commands, type the question mark `?`.
6. Use the command `spy fib` to set a spy point on the `fib` function.

Note that only programs compiled in debug mode can be traced or spied on.

```
Picat> debug
Note: you need to recompile programs in debug mode for tracing

yes

{Trace mode}
Picat> cl(fib)
Compiling:: fib.pi
fib.pi compiled in 0 milliseconds
loading...

yes

{Trace mode}
Picat> main
  Call: (1) main ?
  Call: (2) _e060 = 0 ?
  Exit: (2) 0 = 0 ?
  Call: (3) _e6c0 = 1 ?
  Exit: (3) 1 = 1 ?
  Call: (4) fib(1) ?
  Call: (5) _ed20 = 1 ?
  Exit: (5) 1 = 1 ?
  Exit: (4) fib(1) = 1 ?n
Sum of the even-valued terms is 4613732
```

```

Picat> cl(fib)
Compiling:: fib.pi
fib.pi compiled in 0 milliseconds
loading...

yes

{Trace mode}
Picat> spy fib
Spy point set on fib.

yes

{Spy mode}
Picat> main
  Call: (4) fib(1) ?1
  Exit: (4) fib(1) = 1 ?1
  Call: (8) fib(2) ?1
  Exit: (8) fib(2) = 2 ?n
Sum of the even-valued terms is 4613732

```

## Run Programs Directly

1. Type the DOS command `picat fib`. The Picat system will execute the `main/0` predicate defined in `fib.pi`.
2. Type the DOS command `picat fib 100`. The Picat system will execute the `main/1` predicate, which calls the `fib` function.

```

c:\Picat\work>picat fib
Sum of the even-valued terms is 4613732

c:\Picat\work>picat fib 100
fib(100)=573147844013817084101

```

If the command line contains arguments after the file name, then the Picat system calls `main/1`, passing all the arguments after the file name to the predicate as a list of strings.