GenServer - a cheat sheet

last version: `https://elixir-lang.org/getting-started/mix-otp/cheat-sheet.pdf`
reference: `https://hexdocs.pm/elixir/GenServer.html`

initialization: .start → **`init/1`**

client

```
def start_link(opts \\ []) do
 GenServer.start_link(__MODULE__, match_this, opts)
end
```

returns

```
{:ok, pid}
```

callback

```
def init(match_this) do
 # process input and compute result
 result
end
```

^result =

```
{:ok, state}
{:ok, state, timeout}
{:ok, state, :hibernate}
```

```
{:stop, reason}
:ignore!
```

^reason =

This applies to all callback replies when `result` matches `{:stop, reason}`, and to `reason` argument in `stop` message.

```
:normal
:shutdown
{:shutdown, any}
any
```

termination: .stop → **`terminate/2`**

client

```
def stop(pid, reason \\ :normal,
              timeout \\ :infinity) do
 GenServer.stop(pid, reason, timeout)
end
```

returns

```
:ok
```

callback

```
def terminate(reason, state) do
 # perform cleanup
 # result will not be used
end
```

asynchronous operation: .cast → **`handle_cast/2`**

client

```
def sync_op(pid, args) do
 GenServer.cast(pid, match_this)
end
```

returns

```
:ok
```

callback

```
def handle_cast(match_this, state) do
 # process input and compute result
 result
end
```

^result =

```
{:noreply, state}
{:noreply, state, timeout}
{:noreply, state, :hibernate}
```

```
{:stop, reason, state}
```

synchronous operation: .call → **handle_call/3**

client

```
def sync_op(pid, args) do
 GenServer.call(pid, match_this)
end
```

returns

waits for callback, receives `reply` if result matches `{:reply, reply, ...}` or `{:stop, _, reply, _}`.

callback

```
def handle_call(match_this, from, state) do
 # process input and compute result
 result
end
```

ˆresult =

```
{:reply, reply, state}
{:reply, reply, state, timeout}
{:reply, reply, state, :hibernate}

{:noreply, state}
{:noreply, state, timeout}
{:noreply, state, :hibernate}

{:stop, reason, reply, state}
```

ˆreply =

user defined

handling messages: → **handle_info/2**

client

```
def handle_info(msg, state) do
 # process input and compute result
 result
end
```

ˆresult =

```
{:noreply, state}
{:noreply, state, timeout}
{:noreply, state, :hibernate}

{:stop, reason, state}
```

other

I defined a module with one `abc` function, preceded by the `@impl true` directive, as to force the compiler to give me the list of callback functions I could correctly define.
This first block we have handled.

```
  * GenServer.init/1 (function)
  * GenServer.terminate/2 (function)
  * GenServer.handle_call/3 (function)
  * GenServer.handle_cast/2 (function)
  * GenServer.handle_info/2 (function)
```

Who can fill in the blanks for the following three functions?

```
  * GenServer.code_change/3 (function)
  * GenServer.format_status/2 (function)
  * GenServer.handle_continue/2 (function)
```