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# 1 ATAD | Doxygen documentation

**Doxygen** is a documentation generator, a tool for writing software reference documentation. The **documentation is written within code**, and is thus relatively easy to keep up to date. Doxygen can cross reference documentation and code, so that the reader of a document can easily refer to the actual code (*wikipedia*).

## 1.1 Installation

You must ensure you have the **doxygen** package installed.

```
$> sudo apt install doxygen
```

## 1.2 Documenting code

Use the following convention for all your functions:

```
/**
 * @brief Retrieve the real part of the `Complex` number.
 *
 * This function receives a pointer to an existing complex number
 * and returns, by reference, the real part of the number.
 *
 * @param c [in] PtComplex pointer to the `Complex` number
 * @param re [out] Pointer to variable to hold the value
 *
 * @return COMPLEX_OK and real part in 're'
 * @return COMPLEX_NULL if 'c' is NULL
 */
int complexRe (PtComplex c, double *re);
```

- **@brief** – is used to provide a summary of the function (mandatory);
  - The following lines can be used to provide any other details (opcional);
- **@param** – is used for each parameter of the function, followed by the *name of the parameter*, *[in]* or *[out]* whether its an input or output (by reference) parameter, respectively;

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- `@return` – is used to indicate all possible return values and side-effects of the function (one for each, also, if multiple return values are possible).

A more complete and complex example is available at, e.g., [Doxygen usage example \(for C\)](#) — Matteo Franchin's corner.

## 1.3 Usage

Having your code documented, we must be able to generate the documentation. Doxygen can generate a lot of different outputs, but we'll be interested solely on the *HTML* output, that can be read in a browser.

**The `Doxyfile` must be in the same directory as all your source files.**

### 1.3.1 Template Doxyfile

**This file is already included** in the `CProgram_Template` *GitHub repository*.

For other projects, you can download a premade version using `wget` (assumes *working directory*):

```
$> wget https://raw.githubusercontent.com/estsetubal-  
↪ atad/CProgram_Template/master/Doxyfile
```

## 1.4 Generating doxygen documentation

This will effectively produce the desired documentation, inside a newly created `html` folder:

```
$> doxygen Doxyfile
```

### 1.4.1 Manual configuration

**You can skip this section** if you are using the premade `Doxyfile`.

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1. Inside your working directory (contains your documented source files), execute the following command:

```
$> doxygen -g
```

This will create the default doxygen configuration file named “Doxyfile”.

2. You must edit the “Doxyfile” in any text editor of your choice:
  - Find “EXTRACT\_ALL” and change it to **YES**.
  - Find “GENERATE\_LATEX” and change it to **NO**.
  - Find “DISABLE\_INDEX” and change it to **YES**.
  - Find “GENERATE\_TREEVIEW” and change it to **YES**.
3. Save this file. You can copy it later to any other working directory, avoiding following steps 1 and 2.

## 1.5 Author and support

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Please follow the course *guidelines* when seeking support.