

# pgm

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Create files `pgm16.h` and `pgm16.cpp` that allow to use the following function declaration:

```
1. bool load(const std::string& filename, mat<uint16_t>& img, uint16_t& maxvalue);
```

The definition of template `class mat<T>` is given in the attached `mat.h` file.

The function should open the PGM file specified by `filename`, read its data and store it in the 16 bit per pixel matrix. Moreover it should set `maxvalue` to the value stored in the file.

The raw PGM file consists of:

1. A *magic number* to identify the type of file. The magic number of a PGM image is the sequence of two characters `P5`.
2. The character `'\n'`, that is the Line Feed (LF), that is the character 10 (0x0A), that is a C new line. Beware that this cannot be the pair `"\r\n"`.
3. An optional comment identified by a `'#'` character followed by any sequence of characters and ending with the `'\n'` character. During reading, it is possible to verify if the `'#'` character is present, otherwise this field is not present.
4. The width of the image (W), formatted as a sequence of ASCII characters in decimal.
5. The character `' '`, that is a space.
6. The height of the image (H), formatted as a sequence of ASCII characters in decimal (*i.e.* the number of rows).
7. The character `'\n'`.
8. A string indicating the maximum value (`maxvalue`) that a pixel can take. This string can range from `0` to `65535`.
9. The character `'\n'`.
10. A sequence of H rows, in order from top to bottom. Each row consists of W gray levels, in order left to right. Each gray level is a number from `0` to `maxvalue`. If `maxvalue` is lower than `256` then each gray level is stored with one byte, otherwise it is stored in **big endian** with two bytes.  
In both cases `0` is black and `maxvalue` is white.