

Temperature

Feature Name: Temperature Control

Feature Annotation: Temperature

Source of Information

Domain knowledge, Code comment, Source Code, G-code documentation

Strategy Used:

Through 3D printer construction, we learned that there are temperature sensors located at the hotend where materials are melted for printing and heated bed if there is any. When we looked into the source code to locate this feature, we started from the largest and most central logic file MarlinMain.cpp. We checked whether the comments, variables and method names contain keywords such as “temp”, “thermal”. “temp” key word is the easiest to identify, because it indicates directly that the code is related to the temperature control function. Other keywords such as “thermal” requires domain understanding that they are related to temperature control. According to G-code documentation, there are certain G-codes i.e. M140, M141, M143, M149, M155, M190, M191, M230, M460, M562 and M912 that are directly related to settings for the feature.

Feature Description: This feature is a mandatory feature, and it is used to control the temperature of Hotend or Heated bed if there is any. 3D printers that runs Marlin use extruding method to print 3D objects which require the hardware to sustain at certain degrees of temperature in order to melt the filament. Marlin use this feature to restrain the temperature’s rise and fall. This feature also can be used to control the temperature of the heated bed.

Time spent: This feature is one of 18 features that were located by manually going through all code files of Marlin using our source code method. It took one person 25 hours to identify all 18 features.

Feature Characteristics:

Feature Name	LoFC	SD	TD	Completely Wrapped by ifdef
Temperature Control	142	8	1	No

Ratios of sources (%)

RL	PR	CM	Ifdef	DK	CC	SC	GD
0	0	0	0	30	10	30	30

RL: Release Log; **PR:** Pull Request; **CM:** Commit, **Ifdef:** Ifdef Expression; **DK:** Domain Knowledge; **CC:** Code Comment; **SC:** Source Code; **GD:** G-Code Documentation.