Dalhousie University

Topics in Program Comprehension

CSCI 6306

Architecture Extraction

Group : Something
Bhupendra Rajawat
Bryan Thomas D'silva
Saurabh Singh

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Contents

Abstract

Your abstract.

1 Finding a Software System

We looked at the following software systems and games.

1. **Kodi**: Kodi is an open source software media player and entertainment hub. This is available on atleast seven platforms. This was one of the first softwares we looked at and kept it as a contender

2. **Quake III**: The source code for Quake is challenging and interesting. However, there is almost no documentation for the same and hence we decided not to go ahead with this for now.

3. **GIMP**: GIMP is a cross platform image editor with an excellent community backing it up. We decided to extract the architecture for GIMP. We talk more about GIMP in the further sections.

We also looked at Doom3, SuperTuxKart, Wordpress, TuxRunner and Linux but found GIMP to be the most interesting on to use for this assignment

2 About GIMP

3 Counting the lines of code

3.1 Count Lines of Code

Count Lines of Code, abbreviated as CLOC is a software used to count comment lines, blank lines and physical lines of code[**?**]. We used this software initially when we looked at what software system we need to pick. We can look at figure 1 for the output for GIMP.

3.2 LocMetrics

LocMetrics[**?**] is very similar to what CLOC does. We did find this software interesting because of how it visualized the output.

5182 unique files.
1859 files ignored.

github.com/AlDanial/cloc v 1.72 T=42.12 s (81.5 files/s, 87718.6 lines/s)

Language	files	blank	comment	code
PO File	446	567383	750322	1378612
C	1409	142802	85749	608029
C/C++ Header	1229	17629	25137	61853
make	153	1698	512	12006
HTML	7	8	0	11229
Racket	55	1077	1443	5946
Python	27	974	832	3739
Perl	12	596	216	3680
m4	8	580	36	3108
Windows Module Definition	10	14	6	2970
Qt	5	0	13	1911
XML	37	75	15	1424
yacc	3	114	73	588
Bourne Shell	7	84	59	422
C++	1	70	25	387
JSON	1	0	0	317
XSLT	4	53	12	207
lex	3	91	63	188
Bourne Again Shell	4	37	1	115
Windows Resource File	1	33	45	111
DTD	4	14	4	57
Markdown	1	16	0	39
DOS Batch	1	4	0	32
INI	1	0	0	29
Lua	2	18	45	24
vim script	1	4	12	12
diff	2	3	11	11
CMake	1	1	0	4
SUM:	3435	733378	864631	2097050

Figure 1: CLOC output for GIMP

Operation name	PDB operation name	GUI menu item	Implementation file	Description
gimp:flood	gimp-selection-flood	Select -> Remove holes	gimpoperationflood.c	Flood algorithm

Figure 2: Documentation on operation algorithms

4 Directory Structure

5 Entry Point

6 Build Process

7 Control Flow

8 Dependencies

9 Functional Needs

10 Algorithms

To find the underlying algorithms behind the operations performed on gimp, the wiki for the same had a link to the Algorithms used. We expected to find all the underlying algorithms here but encountered a problem. There was only one operation described here shown in figure 2

Since this is implemented in the gimpoperationflood.c, the best way to find the algorithms for the other operations performed would be to have a look at where this file is located.

The app/operations folder is where this file located. Looking at the other files in the folder, we got an idea of where to look incase we had to change or add any further operations. Since these operations are triggered using the GUI, changing something here would cause us to look at the UI elements to be updated as well.

Figure 3: This is a figure caption.

Item	Quantity
Widgets	42
Gadgets	13

Table 1: An example table.

11 Conclusion

12 Some LaTeX Examples

12.1 Sections

Use section and subsection commands to organize your document. LaTeX handles all the formatting and numbering automatically. Use ref and label commands for cross-references.

12.2 Comments

Comments can be added to the margins of the document using the todo command, as shown in the example on the right. You can also add inline comments too:

This is an inline comment.

Here's a comment in the margin!

12.3 Tables and Figures

Use the table and tabular commands for basic tables — see Table 1, for example. You can upload a figure (JPEG, PNG or PDF) using the files menu. To include it in your document, use the includegraphics command as in the code for Figure 3 below.

12.4 Mathematics

LaTeX is great at typesetting mathematics. Let $X_1, X_2, \ldots, X_n$ be a sequence of independent and identically distributed random variables with $\mathrm{E}[X_i] = \mu$

and $\mathrm{Var}[X_i] = \sigma^2 < \infty$, and let

$$S_n = \frac{X_1 + X_2 + \cdots + X_n}{n} = \frac{1}{n}\sum_{i}^{n} X_i$$

denote their mean. Then as n approaches infinity, the random variables $\sqrt{n}(S_n - \mu)$ converge in distribution to a normal $\mathcal{N}(0, \sigma^2)$.

12.5 Lists

You can make lists with automatic numbering ...

1. Like this,
2. and like this.

... or bullet points ...

- Like this,
- and like this.

We hope you find writeLaTeX useful, and please let us know if you have any feedback using the help menu above.