**A1) Initiation behind conjecture:** To deduce the relation between change Complexity and the System Complexity we are comparing:

At any time, only the files that are changed to the Change Complexity measure (CCM).

* **CCMv(i) ~ TCMv(i+1) – TCMv(i)**

**A2) Correlation Table: Data produce by the scripts.**

* select mods, hunk\_dist, indent\_sum, loc, hlen, maxcy from change\_complexity c, cmetrics\_dif s, git\_commit g where c.commit = s.commit and s.commit = g.commit order by committer\_dt asc;

mods hunk\_dist indent\_sum loc hlen maxcy

mods 1.0000000 0.6531009 0.8536395 0.3019885 0.2556697 0.2323545

hunk\_dist 0.6531009 1.0000000 0.6295024 0.1821004 0.1593148 0.1082353

indent\_sum 0.8536395 0.6295024 1.0000000 0.2775322 0.2374514 0.2235355

loc 0.3019885 0.1821004 0.2775322 1.0000000 0.8859322 0.5378118

hlen 0.2556697 0.1593148 0.2374514 0.8859322 1.0000000 0.5133827

maxcy 0.2323545 0.1082353 0.2235355 0.5378118 0.5133827 1.0000000

**A3) Conclusion:**

* hunk\_dist has a strong co-relation with the mods(0.65) and indent\_sum(0.62)
* mods has a strong co-relation with the indent\_sum(0.85)
* hlen has a strong co-relation with loc(0.88)

**B1) Initiation behind conjecture**: In this Hypothesis we are comparing summation of change complexity to the System complexity at any given point.

* **TCMv(i+1) ~ ∑0-i CCMv(i)**

**B2) Correlation Table:**

* select mods, hunk\_dist, indent\_sum, loc, hlen, maxcy from change\_decay\_1000 c, cmetrics\_sum s, git\_commit g where c.commit = s.commit and s.commit = g.commit order by committer\_dt asc;

mods hunk\_dist indent\_sum loc hlen maxcy

mods 1.0000000 0.2457651 0.9585704 -0.2330296 -0.2068957 -0.3838026

hunk\_dist 0.2457651 1.0000000 0.3149772 -0.2082633 -0.2176747 -0.1925096

indent\_sum 0.9585704 0.3149772 1.0000000 -0.1843694 -0.1604110 -0.3237897

loc -0.2330296 -0.2082633 -0.1843694 1.0000000 0.9967415 0.9521332

hlen -0.2068957 -0.2176747 -0.1604110 0.9967415 1.0000000 0.9373538

maxcy -0.3838026 -0.1925096 -0.3237897 0.9521332 0.9373538 1.0000000

B3**) Conclusion:**

* mods have a strong relation with Indent\_sum(0.95) and negative co-relation with maximum cyclomatic complexity.
* Lines of code(loc) have a very strong correlation with hlen(0.99) and maxcy(0.95)
* Hlen has a strong co relation with maxcy (0.93).

**C1) Initiation behind conjecture:**  Here we are comparing only files that have changed to the Change Complexity

**C2) Co-relation table**:

* select mods, hunk\_dist, indent\_sum, loc, hlen, maxcy from change\_complexity c, cmetrics\_change s, git\_commit g where c.commit = s.commit and s.commit = g.commit order by committer\_dt asc;

Mods hunk\_dist indent\_sum loc hlen maxcy

mods 1.0000000 0.6552309 0.8596335 0.2272541 0.2252535 0.2113257

hunk\_dist 0.6552309 1.0000000 0.6339968 0.2687500 0.2637703 0.2230544

indent\_sum 0.8596335 0.6339968 1.0000000 0.2601193 0.2605987 0.2812842

loc 0.2272541 0.2687500 0.2601193 1.0000000 0.9921449 0.8214036

hlen 0.2252535 0.2637703 0.2605987 0.9921449 1.0000000 0.8459347

maxcy 0.2113257 0.2230544 0.2812842 0.8214036 0.8459347 1.0000000

**C3) Conclusion:**

* Mods have strong co-relation with indent\_sum (0.85)
* Lines of code(loc) have a strong co-relation with hlen (0.99) and maxcy (0.82)
* maxcy has correlation with hlen(0.84)