- **line_id** can be a parameterized value from the param.config file. Preface these with a "$".
- **field_type (without line_id)** The following `field_types` operate on the entire file, not just on selected lines. These entries will have no `line_type` or `line_id` fields.
  - **LINE_COUNT** – The quantity of lines in the file. Remaining fields are ignored.
  - **CHECKSUM** – The result value is set to the md5 checksum of the file.
  - **CONTAINS** – The result value is set to TRUE if the file contains the string represented in field_id.
  - **FILE_REGEX** – The result value is set to TRUE if the file contains the regular expression represented in field_id. The python findall function is used on the entire file. See the acl lab for an example of multi-line expressions.
  - **LOG_TS** – Used with timestamped log files, this results in a timestamped set of boolean results with a value of TRUE for each log line that contains the string represented in the field_id.
  - **FILE_REGEX_TS** Like LOG_TS, but uses regular expressions.
  - **LOG_RANGE** – Similar to LOG_TS, except the timestamped entries are ranges delimited by the matching log entries.
  - **STRING_COUNT**–The result value is set to the quantity of occurances of the string represented in field_id.
  - **COMMAND_COUNT**-Intended for use with bash_history files, counts the occurances of the command given in the field_id. Commands are evaluatd considering use of sudo, time, etc.
  - **PARAM** – The result value is set to nth parameter (0 is the program name), provided in the program invocation.
  - **TIME_DELIM** – The timestamps of the named files are used to create a set of time ranges with periods between the timestamps of each file, e.g., for use in time_during goal operators. File identifiers should not include stdin or stdout qualifiers. The file identifier may be a list of container:file pairs separated by semicolons.
- **field_id** – An integer identifying the nth occurance of the field type. Alternately may be "LAST" for the last occurance of the field type, or "ALL" for the entire line (which causes the field type to be ignored). Or if field_type is SEARCH, the field_id is treated as the search expression. If field_type is "CONTAINS", the remainder of the line is treated as a string to be searched for. If field_type is "PARAM", the field_id is the 1-based index of the parameter whose value is to be assigned, and no other fields should be present. If field_type is "CHECKSUM", no other field is required.

6.2.2 Converting artifact file formats

Some artifact file formats are not easily referenced by results.config directives. For example, a browser history file in the .sqlite format is binary. Such files can be processed into a more convenient form through use of a script at:

```
$LABTAINER_DIR/labs/[lab]/instr_config/pregrade.sh
```

Modify or expand on the default pregrade.sh script. In general, the pregrade.sh script is expected to extract or convert data from an artifact file, and write it into a new file in the .local/results directory of the container. The `pubkey` lab has an example use of pregrade.sh.