Chapter 5

Fault Injection

As a part of our testing method, faults were injected into the source code for Mercurial. It is important to see what would happen if the wrong logic was used in the code, or if there was a simple error in the code. Five different faults were injected into four of our tested methods.

In progress.py, the fmtremaining method was changed by

```
def fmtremaining(seconds):
    """format a number of remaining seconds in human readable way

    This will properly display seconds, minutes, hours, days if needed"""
    if seconds > 1 and seconds < 60:
        # i18n: format XX seconds as "XXs"
        return _("%02ds") % (seconds)
    minutes = seconds // 60
    if minutes < 60:
        seconds -= minutes * 60
        # i18n: format X minutes and YY seconds as "XmYYs"
        return _("%dm%02ds") % (minutes, seconds)
    # we're going to ignore seconds in this case
    minutes += 1
    hours = minutes // 60
    minutes -= hours * 60
    if hours < 30:
        # i18n: format X hours and YY minutes as "XhYYm"
        return _("%dh%02dm") % (hours, minutes)
    # we're going to ignore minutes in this case
    hours += 1
    days = hours // 24
    hours -= days * 24
    if days < 15:
        # i18n: format X days and YY hours as "XdYYh"
        return _("%dd%02dh") % (days, hours)
    # we're going to ignore hours in this case
    days += 1
    weeks = days // 7
    days -= weeks * 7
    if weeks < 55:
```

```
        # i18n: format X weeks and YY days as "XwYYd"
        return _("%dw%02dd") % (weeks, days)
    # we're going to ignore days and treat a year as 52 weeks
    weeks += 1
    years = weeks // 52
    weeks -= years * 52
    # i18n: format X years and YY weeks as "XyYYw"
    return _("%dy%02dw") % (years, weeks)
```

In the simplemerge.py, we switched the return values.

```
def intersect(ra, rb):
    """Given two ranges return the range where they intersect or None.

    >>> intersect((0, 10), (0, 6))
    (0, 6)
    >>> intersect((0, 10), (5, 15))
    (5, 10)
    >>> intersect((0, 10), (10, 15))
    >>> intersect((0, 9), (10, 15))
    >>> intersect((0, 9), (7, 15))
    (7, 9)
    """
    assert ra[0] <= ra[1]
    assert rb[0] <= rb[1]

    sa = max(ra[0], rb[0])
    sb = min(ra[1], rb[1])
    if sa < sb:
        return sb, sa
    else:
        return None
```

In the templatefilters.py, we added 1 to every count

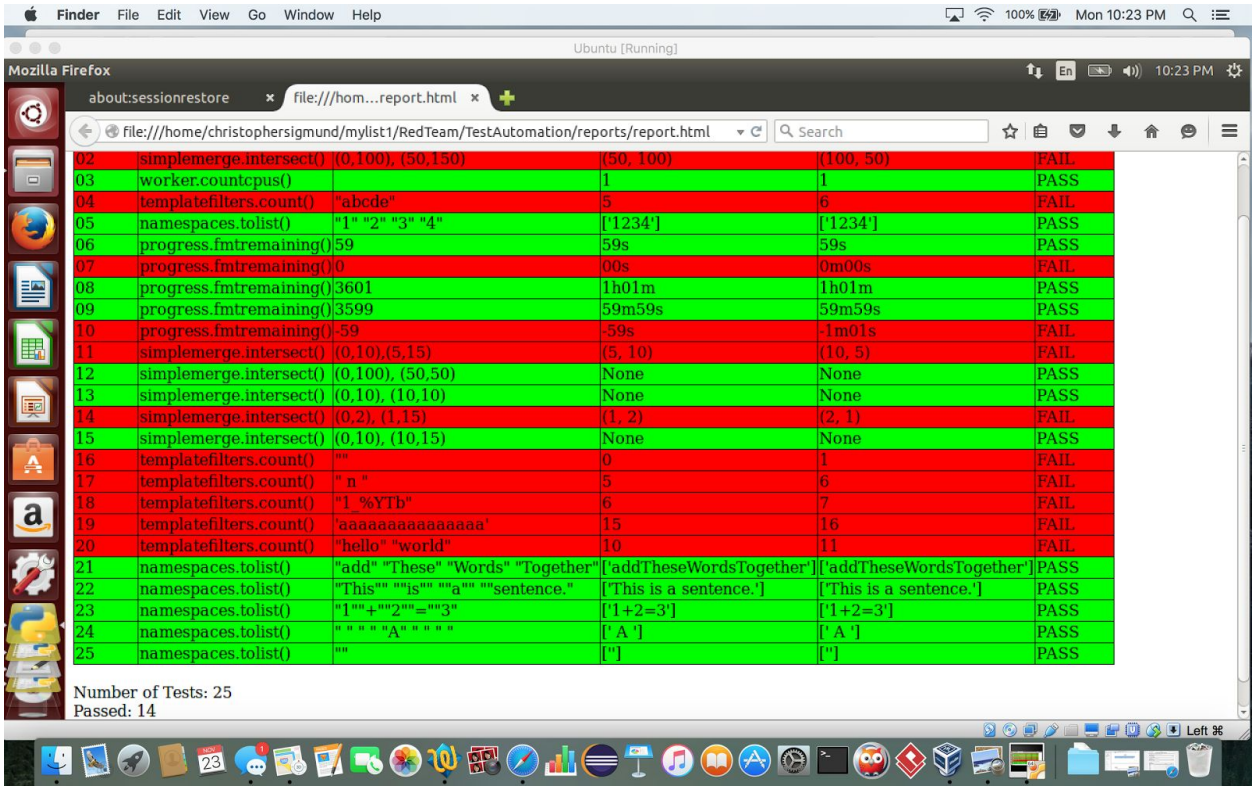
```
def count(i):
    """:count: List or text. Returns the length as an integer."""
    return len(i) + 1
```

In the namespaces.py, we removed the if statement and only returned [val]

```
def tolist(val):
    """
    a convenience method to return an empty list instead of None
    """
    if val is None:
        return []
    else:
        return [val]
```

In worker.py, we changed the active number of cpu's from 1 to 4 to simulate a Macbook Pro

```
def countcpus():
    '''try to count the number of CPUs on the system'''
    try:
        return multiprocessing.cpu_count()
    except NotImplementedError:
        return 4
```



02	simplemerge.intersect()	(0,100), (50,150)	(50, 100)	(100, 50)	FAIL
03	worker.countcpus()		1	1	PASS
04	templatefilters.count()	"abcde"	5	6	FAIL
05	namespaces.tolist()	"1" "2" "3" "4"	['1234']	['1234']	PASS
06	progress.fmtremaining()	59	59s	59s	PASS
07	progress.fmtremaining()	0	00s	0m00s	FAIL
08	progress.fmtremaining()	3601	1h01m	1h01m	PASS
09	progress.fmtremaining()	3599	59m59s	59m59s	PASS
10	progress.fmtremaining()	-59	-59s	-1m01s	FAIL
11	simplemerge.intersect()	(0,10),(5,15)	(5, 10)	(10, 5)	FAIL
12	simplemerge.intersect()	(0,100), (50,50)	None	None	PASS
13	simplemerge.intersect()	(0,10), (10,10)	None	None	PASS
14	simplemerge.intersect()	(0,2), (1,15)	(1, 2)	(2, 1)	FAIL
15	simplemerge.intersect()	(0,10), (10,15)	None	None	PASS
16	templatefilters.count()	""	0	1	FAIL
17	templatefilters.count()	" n "	5	6	FAIL
18	templatefilters.count()	"1_%YTb"	6	7	FAIL
19	templatefilters.count()	'aaaaaaaaaaaaaaa'	15	16	FAIL
20	templatefilters.count()	"hello" "world"	10	11	FAIL
21	namespaces.tolist()	"add" "These" "Words" "Together"	['addTheseWordsTogether']	['addTheseWordsTogether']	PASS
22	namespaces.tolist()	"This"" ""is"" ""a"" ""sentence."	['This is a sentence.']	['This is a sentence.']	PASS
23	namespaces.tolist()	"1""+""2""=""3"	['1+2=3']	['1+2=3']	PASS
24	namespaces.tolist()	" " " " "A" " " " "	[' A ']	[' A ']	PASS
25	namespaces.tolist()	""	['']	['']	PASS

Number of Tests: 25
Passed: 14