

HW3

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0.

Assumptions I made

- 1) Ignore for(;;) as it does not contain any useful information
- 2) Ignore ? (Conditional operator) in the enum as enum values should be evaluated in the compile time, I was not able to insert my code.

1.

Attached kcov-branch-identify_comment.cpp file.

kcov-branch-identify.cpp is for problem 4. kcov-branch-identify_comment.cpp is same file with kcov-branch-identify.cpp but just commented some line as kcov-branch-identify.cpp will not accept .c files.

Samle output for ./kcov-branch-identify_comment example-kcov.c

```
function: f2
  If      ID: 0   Line: 4           Col: 2       Filename: example-kcov/example-kcov.h
function: f1
  If      ID: 1   Line: 19          Col: 2       Filename: example-kcov/example-kcov.c
function: main
  If      ID: 2   Line: 30          Col: 2       Filename: example-kcov/example-kcov.c
  If      ID: 3   Line: 32          Col: 9       Filename: example-kcov/example-kcov.c
  For      ID: 4   Line: 40          Col: 2       Filename: example-kcov/example-kcov.c
  While    ID: 5   Line: 45          Col: 2       Filename: example-kcov/example-kcov.c
  Do       ID: 6   Line: 50          Col: 2       Filename: example-kcov/example-kcov.c
  Case     ID: 7   Line: 52          Col: 4       Filename: example-kcov/example-kcov.c
  Case     ID: 8   Line: 55          Col: 4       Filename: example-kcov/example-kcov.c
  ?        ID: 9   Line: 56          Col: 9       Filename: example-kcov/example-kcov.c
  Default  ID: 10  Line: 59          Col: 4       Filename: example-kcov/example-kcov.c
  If      ID: 11  Line: 64          Col: 2       Filename: example-kcov/example-kcov.c
  ?        ID: 12  Line: 64          Col: 7       Filename: example-kcov/example-kcov.c
  ImpDef.  ID: 13  Line: 68          Col: 2       Filename: example-kcov/example-kcov.c
  Case     ID: 14  Line: 69          Col: 3       Filename: example-kcov/example-kcov.c
  Case     ID: 15  Line: 72          Col: 3       Filename: example-kcov/example-kcov.c
  Do       ID: 16  Line: 77          Col: 2       Filename: example-kcov/example-kcov.c
  If      ID: 17  Line: 77          Col: 2       Filename: example-kcov/example-kcov.c
Total number of branches: 30
```

2.

Attached results2.txt

// Attached kcov-branch-identify.cpp is not directly applicable for grep.c, as it is targeted for grep.i (Problem 4)

To get the desired output, you should comment some part of `kcov-branch-identify.cpp` or just use `kcov-branch-identify_comment.cpp` attached.

function: Fexecute

For	ID: 1653	Line: 10888	Col: 3	Filename: lab02/grep.c
If	ID: 1654	Line: 10890	Col: 7	Filename: lab02/grep.c
If	ID: 1655	Line: 10893	Col: 7	Filename: lab02/grep.c
If	ID: 1656	Line: 10895	Col: 4	Filename: lab02/grep.c
If	ID: 1657	Line: 10897	Col: 4	Filename: lab02/grep.c
If	ID: 1658	Line: 10901	Col: 12	Filename: lab02/grep.c
For	ID: 1659	Line: 10902	Col: 2	Filename: lab02/grep.c
If	ID: 1660	Line: 10904	Col: 6	Filename: lab02/grep.c
If	ID: 1661	Line: 10906	Col: 6	Filename: lab02/grep.c
If	ID: 1662	Line: 10921	Col: 3	Filename: lab02/grep.c
While	ID: 1663	Line: 10926	Col: 3	Filename: lab02/grep.c

Total number of branches: 3079

3.

Attached `test_script1.sh`

Sorry for inconvenience, but before executing `test_script1.sh`, you should change Makefile

TARGET := kcov-branch-identify => TARGET := kcov-branch-identify_comment

AS kcov-branch-identify is for problem 4

Attached `kcov-branch-identify.cpp_comment.gcov`, `grep.c`

It is result of running `./kcov-branch-identify_comment grep.c`

File '`kcov-branch-identify.cpp`'

Lines executed:96.61% of 177

Branches executed:97.30% of 74

Taken at least once:87.84% of 74

Calls executed:96.35% of 438

Creating 'kcov-branch-identify_comment.cpp.gcov'

4.

Attached kcov-branch-identify.cpp

To use this cpp file, you should give ~.i file, then it will generate ~-cov.i file.

Example usage)

```
./kcov-branch-identify grep.i
```

```
gcc grep-cov.i -o grep-cov
```

```
./grep-cov -n "if" grep.c
```

If you run above code, you will get coverage.dat file

By the way, my program runs very slowly, please wait for the outcome thank you

5.

Attached kcov-branch-identify.cpp

1) ./grep -n "if" grep.c

Attached coverage1.dat

```
12728      0      0      (end = memchr(beg + len, '
', (buf + size) - (beg + len))) != 0
12733      0      0      beg > buf && beg[-1] != '
',
```

Covered: 330 / Total: 3079 = 10.717766%

2) ./grep-cov -E "[0-9][0-9]+" lab02/grep.c

Attached coverage2.dat

```
12705      0      0      try + len < buf + size && ((1 && ((*_ctype_b_loc())[int](((unsigned char)try[len]))) &
(unsigned short)_Isalnum)) || ((unsigned char)try[len]) == '_'
12728      0      0      (end = memchr(beg + len, '
', (buf + size) - (beg + len))) != 0
```

```
12733      0      0      beg > buf && beg[-1] != '  
,
```

Covered: 463 / Total: 3079 = 15.037350%

3) ./grep -E "[[:digit:]]+[[:alpha:]]" grep.c

Attached coverage3.dat

```
12728      0      0      (end = memchr(beg + len, '  
, (buf + size) - (beg + len))) != 0  
12733      0      0      beg > buf && beg[-1] != '  
,
```

Covered: 426 / Total: 3079 = 13.835661%

6.

Attached test_script2.sh

Sorry for inconvenience, but before executing test_script2.sh, make sure that contents in the Makefile is

TARGET := kcov-branch-identify

Attached kcov-branch-identify.cpp.gcov, grep.c

It is result of runnig ./kcov-branch-identify grep.i

File 'kcov-branch-identify.cpp'

Lines executed:97.67% of 300

Branches executed:100.00% of 90

Taken at least once:88.89% of 90

Calls executed:98.81% of 1092

Creating 'kcov-branch-identify.cpp.gcov'