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Operating Systems
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Course: CO20-320202
Date: 2019-11-25
Time: 10 min.

OS 2019 Quiz Sheet #6

Problem 6.1: *file system concepts* (1+1+1+1+2+4 = 10 points)

a) What is the smallest possible link count of regular accessible files? Explain.

b) What is the smallest possible link count of non-root accessible directories? Explain.

c) Does the `unlink` system call always remove a file from the file system when it succeeds? Explain.

d) Can a file with a link count of 0 still be used? Explain.

e) Explain the differences between hard links and soft links. (When and how are they resolved? Are they scoped to certain portions of a file system name space?)

f) The following sequence of shell commands is successfully executed in a directory where `a` does not yet exist.

```
mkdir a
mkdir a/b
mkdir a/b/c
mkdir a/b/d
touch a/b/c/x
ln a/b/c/x a/b/d/y
ln a/b/c/y a/b/z
```

After executing the shell commands, what is the link count of the following file system objects and why (indicate the start of the links)? Hint: Draw a tree representation and then fill in the table below.

path	count	start of links
`a`		
`a/b`		
`a/b/d`		
`a/b/c/x`		