Tests for small files and directories in Xv6

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NOTE : The answer to Why a test is written? is answered under PURPOSE of output for each test.

1. Create small directory

```
    -> A. Creating a small directory in a normal directory
    -> B. Creating a small directory in a small directory
    -> C. Creating a normal directory in a small directory
```

Test 1.A :

```
$ mkSFdir sdir
$ cd sdir
$ ls
.               4 23 32
..              1 1 512
$ cd ..
$ ls
.               1 1 512
..              1 1 512
README          2 2 2170
cat             2 3 13644
echo            2 4 12652
forktest        2 5 8088
grep            2 6 15520
init            2 7 13236
kill            2 8 12708
ln              2 9 12604
ls              2 10 14788
mkdir           2 11 12788
mkSFdir         2 12 12800
testlink        2 13 13104
rm              2 14 12764
sh              2 15 23252
stressfs        2 16 13436
```

```
usertests      2 17 56364
wc             2 18 14184
zombie         2 19 12428
touch          2 20 12788
writegarb      2 21 13244
console        3 22 0
sdir           4 23 32
```

Purpose : Creates a small directory under the root directory to check that a small directory can be created in a normal directory.*We cam see sdir directory is of TYPE 4, which is small directory.*

Test 1.B :

```
$ mkSFdir sdir
$ cd sdir
$ mkSFdir sdir2
$ cd sdir
$ ls
.              4 24 32
..             4 23 48
```

Purpose : Creates a small directory under a small directory to check that a small directory can be created inside a small directory in a hierarchy.

Test 1.C :

```
$ mkSFdir sdir
$ cd sdir
$ mkdir ndir
$ cd ndir
$ ls
.              1 25 32
..             4 23 48
```

Purpose : Creates a normal directory under a small directory to check that a normal directory can be created in a small directory. **As there was no constraint that normal dirs cannot exist under small dirs**.

2. Delete small directory

```
    -> A. Deleting a small directory
```

Test 2.A :

```
$ mkSFdir sdir
$ ls
.               1 1 512
..              1 1 512
README          2 2 2170
cat             2 3 13644
echo            2 4 12652
forktest        2 5 8088
grep            2 6 15520
init            2 7 13236
kill            2 8 12708
ln              2 9 12604
ls              2 10 14788
mkdir           2 11 12788
mkSFdir         2 12 12800
testlink        2 13 13104
rm              2 14 12764
sh              2 15 23252
stressfs        2 16 13436
usertests       2 17 56364
wc              2 18 14184
zombie          2 19 12428
touch           2 20 12788
writegarb       2 21 13244
console         3 22 0
sdir            4 23 64
$ cd sdir
$ ls
.               4 23 32
..              1 1 512
$ cd ..
$ rm sdir
$ ls
.               1 1 512
..              1 1 512
README          2 2 2170
cat             2 3 13644
echo            2 4 12652
forktest        2 5 8088
grep            2 6 15520
init            2 7 13236
kill            2 8 12708
ln              2 9 12604
ls              2 10 14788
mkdir           2 11 12788
mkSFdir         2 12 12800
testlink        2 13 13104
rm              2 14 12764
sh              2 15 23252
stressfs        2 16 13436
```

```
usertests      2 17 56364
wc             2 18 14184
zombie         2 19 12428
touch          2 20 12788
writegarb      2 21 13244
console        3 22 0
```

Purpose : Deletes a small directory under a normal directory to check that a small directory can be deleted using **rm** command.

3. Create

```
    -> A. Creating a file inside a small directory
    -> B. Creating a file outside a small directory
```

Test 3.A :

```
$ mkSFdir sdir
$ cd sdir
$ touch stestfile
$ ls
.              4 23 32
..             1 1 512
stestfile      5 24 0
```

Purpose : To check if creating a file under a small directory creates a small file.**The above output shows that a small file of TYPE 5 is created inside sdir directory.**

Test 3.B :

```
$ mkdir ndir
$ cd ndir
$ touch ntestfile
$ ls
.              4 25 32
..             1 1 512
ntestfile      2 26 0
```

Purpose : To check if creating a file under a normal directory creates a normal file.**The above output shows that a normal file of TYPE 2 is created inside ndir directory.**

4. Open

```
        -> A. Opening a small file in a small directory
        -> B. Opening a normal file in a small directory.
```

Test 4.A :

```
$ mkSFdir sdir
$ cd sdir
$ touch stestfile
$ writegarb stestfile
Write size : 51
$ cat stestfile
Machines take me by surprise with great frequency.
```

Purpose : To check if opening a small file under a small directory works.***The above output shows that a write was executed on a small file of TYPE 5 created under sdir small directory.***

```
The above test also tests for :
    5.A : Reading less than 52 bytes from small files,
    6.A :  Writing less than 52 bytes from small files
```

Test 4.B :

```
$ mkSFdir sdir
$ cd sdir
$ touch stestfile
$ ls
.               4 31 48
..              1 1 512
stestfile       5 32 0
$ writegarb stestfile more_than_52
Write size : 59
$ ls
.               4 31 48
..              1 1 512
stestfile       2 32 59
$ cat stestfile
Machines take me by surprise with great frequency testing.
```

Purpose : To check if opening a noraml file under a small directory works.***The above output shows that a write was executed on a small file of TYPE 5 created under sdir small directory, BUT once we write more than 52 bytes, it gets converted into a normal file of TYPE 2!.***

```
    The above test also tests for :
        6.C :  Writing less than 52 bytes from small files
```

5. Read

```
        -> A. Reading less than 52 bytes from small files
        -> B. Reading exactly 52 bytes from small files
        -> C. Reading more than 52 bytes from small files
```

Test 5.A :

```
  Tested under 4.A
```

Purpose : To check if reading less than 52 bytes from a small file works.

Test 5.B :

```
  $ mkSFdir sdir
  $ cd sdir
  $ touch stestfile
  $ writegarb stestfile exactly_52
  Write size : 52
  $ readtest stestfile 52
  Read 52 bytes.
```

Purpose : To check if reading exactly 52 bytes from a small file works and soesn't run into corner case issues.

Test 5.C :

```
  $ mkSFdir sdir
  $ cd sdir
  $ touch stestfile
  $ writegarb stestfile exactly_52
  Write size : 52
  $ readtest stestfile 60
  Read 51 bytes.
```

Purpose : To check if reading more than 52 bytes from a small file gives an error or just reads 52 bytes or less (how much ever exists!).

6. Write

```
    -> A. Writing less than 52 bytes from small files
    -> B. Writing exactly 52 bytes from small files
    -> C. Writing more than 52 bytes from small files
```

Test 6.A :

```
  Tested under 4.A
```

Purpose : To check if writing less than 52 bytes to a small file works.

Test 6.B :

```
  $ mkSFdir sdir
  $ cd sdir
  $ touch stestfile
  $ writegarb stestfile exactly_52
  Write size : 52
  $ cat stestfile
  Machines take me by surprise with great frequency .
  $ ls
  .              4 24 48
  ..             1 1 512
  tf             5 25 52
```

Purpose : To check if writing exactly 52 bytes to a small file works runs into any corner case issues.

Test 6.C :

```
  Tested under 4.B
  todo
```

Purpose : **To check if writing more than 52 bytes to a small file gives an error or converts it into a normal file from small file, we also read from it to make sure the contents are transferred to the disk's data blocks.**

7. Delete

```
    -> A. Deleting a small file
```

Test 7.A :

```
$ mkSFdir sdir
$ cd sdir
$ touch stestfile
$ ls
.               4 31 48
..              1 1 512
stestfile       5 32 0
$ rm stestfile
$ ls
.               4 31 48
..              1 1 512
```

Purpose : To check if deleting a small file works using the **rm** command which ultimately uses the unlink system call to delete a file.```

All the above mentioned commands works in our Xv6 copy, so please don't hesistate to try them out!

Thank you!