ECE 331

Homework 2

See course web site for due date

Place your typed homework answers in `vim`. Print single sided with your name using a **fixed point font**. No need to restate questions. Fully investigating questions is required for a higher grade. Please use the kernel coding style for all code. Please use your RPi for developing answers. Although code should be written and run on a RPi, it should run on ANY POSIX compliant OS. As always, all code shall be comment, conform to the Linux Kernel Coding Style, and error conditions shall be checked and appropriately handled.

1. Give the concise command(s) to
   a) Find the weather utilities package
   b) install the weather utilities
   c) list the files the package installed
   d) remove the package (since it's actually broken....)

2. Give the concise command(s) to
   a) download the avrdude source code
   b) download the endpoint patch for avrdude
   c) apply the endpoint patch to avrdude
   d) install the compile dependencies for avrdude
   e) create a dpkg patch (save changelog entry for part h)
   f) build a new patched avrdude
   g) install the new patched avrdude
   h) Include the patch changelog text for this part (done in part e)

3. Give the concise command(s) create a link from the existing file named /sys/var/adm/armv7/hf to a file named skywalker in the current directory.

4. On your RPi, write a C program that prints the total number of BLOCKS used by a list of files passed on the command line. Obtain the block count by calling `stat(2)`. As always, check for and act appropriately upon error. For example if your program executable is named `bsum`:

```
# stat find
  File: '/usr/bin/find'
  Size: 129640          Blocks: 256        IO Block: 4096   regular file
Device: b302h/45826d    Inode: 925640      Links: 1
Access: (0755/-rwxr-xr-x)  Uid: (    0/    root)   Gid: (    0/    root)
Access: 2015-11-03 20:37:34.549907864 -0500
Modify: 2014-07-11 01:42:56.000000000 -0400
Change: 2015-11-03 20:27:31.135060689 -0500
  File: '/usr/bin/fold'
  Size: 26284           Blocks: 56         IO Block: 4096   regular file
Device: b302h/45826d    Inode: 925184      Links: 1
Access: (0755/-rwxr-xr-x)  Uid: (    0/    root)   Gid: (    0/    root)
Access: 2015-11-03 20:37:28.939955770 -0500
Modify: 2015-03-21 00:20:55.000000000 -0400
Change: 2015-11-03 20:27:24.885114060 -0500
 Birth: -find fold free

./bsum /usr/bin/find /usr/bin/fold
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```

For your answer include the source code.

5. On your RPi, write a C program that prints the total number of BLOCKS used by all filenames that match a **single glob** passed on the command line. Have **your** program do the globbing (not the shell) by calling `glob(3)` in your program. As always, check for and act appropriately upon error.
   a) Give an example command of matching all the `jpg` image files in `/usr/local/images/`
   b) For your answer include the source code.

6. Use `debugfs` to answer the following questions
   a) Give the command(s) to determine the number of block groups are present on your RPi root filesystem
   b) Give the command(s) to find the inode number of `/bin/ls`
   c) Give the command(s) to find the filename associated with inode number `11`