OS Lab2

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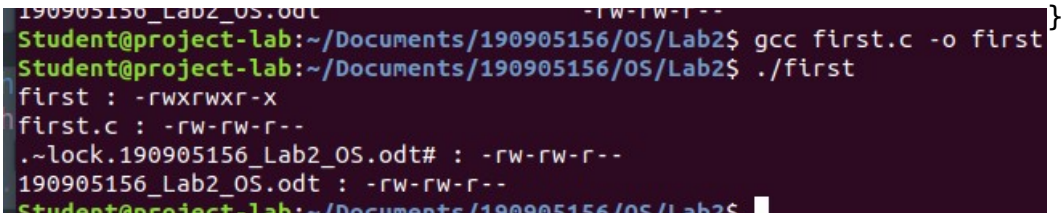
Section D

1.) Write a C program to emulate the ls -l UNIX command that prints all files in a current directory and lists access privileges, etc. DO NOT simply exec ls -l from the program.

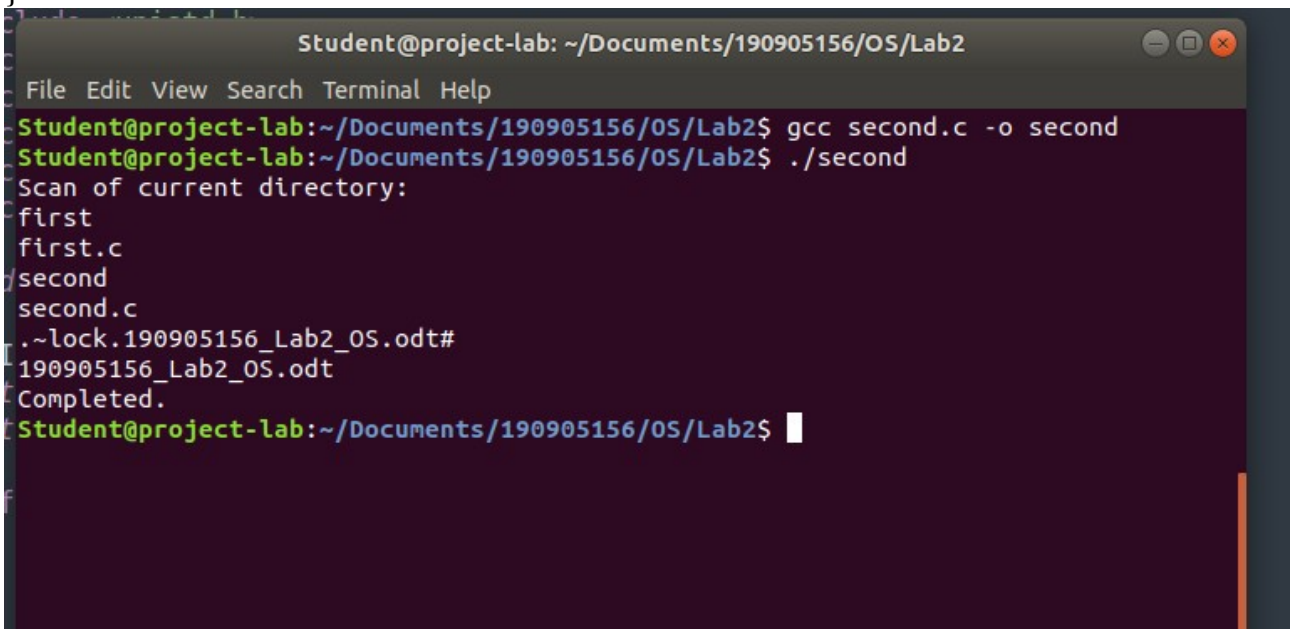
```
#include <unistd.h>
#include <stdio.h>
#include <sys/stat.h>
#include <sys/types.h>
#include <dirent.h>

int main()
{
  DIR * dir;
  struct stat statbuf;
  struct dirent * entry;

  if((dir = opendir(".")) == NULL)
  {
    printf("Cannot open directory \n");
    return 0;
  }

  chdir(".");
  while((entry = readdir(dir)) != NULL)
  {
    lstat(entry->d_name,&statbuf);

    if(!S_ISDIR(statbuf.st_mode))
    {
      printf("%s : ",entry->d_name);
      printf((S_ISDIR(statbuf.st_mode)) ? "d" : "-");
      printf((statbuf.st_mode & S_IRUSR) ? "r" : "-");
      printf((statbuf.st_mode & S_IWUSR) ? "w" : "-");
      printf((statbuf.st_mode & S_IXUSR) ? "x" : "-");
      printf((statbuf.st_mode & S_IRGRP) ? "r" : "-");
      printf((statbuf.st_mode & S_IWGRP) ? "w" : "-");
      printf((statbuf.st_mode & S_IXGRP) ? "x" : "-");
      printf((statbuf.st_mode & S_IROTH) ? "r" : "-");
      printf((statbuf.st_mode & S_IWOTH) ? "w" : "-");
      printf((statbuf.st_mode & S_IXOTH) ? "x" : "-");
      printf("\n");
    }
  }
```



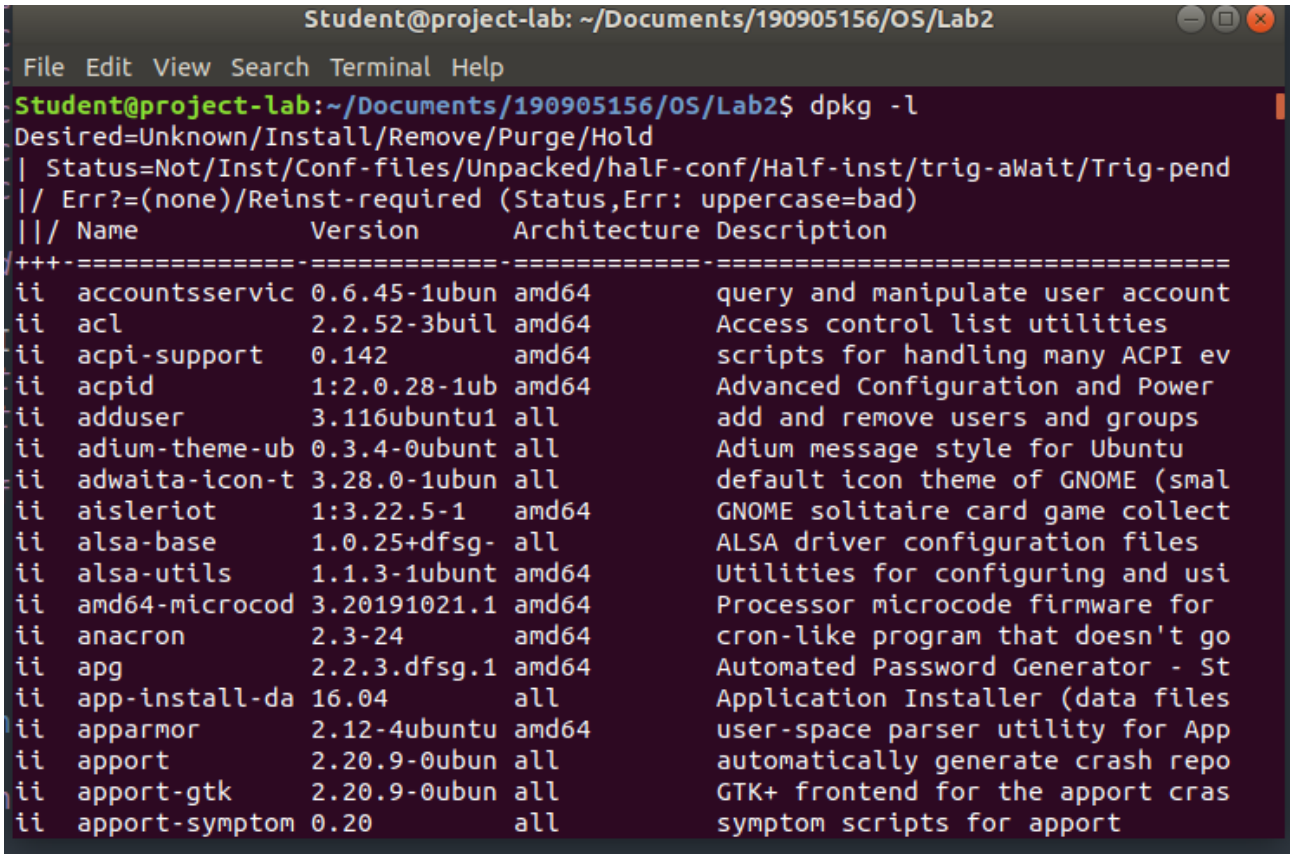
2.) Write a program that will list all files in a current directory and all files in subsequent subdirectories.

```
#include <unistd.h>
#include <stdio.h>
#include <dirent.h>
#include <string.h>
#include <sys/stat.h>
#include <stdlib.h>

void printdir(char *dir, int depth)
{
  DIR *d;
  struct dirent *entry;
  struct stat statbuf;

  if((d = opendir(dir)) == NULL)
  {
    fprintf(stderr,"Cannot open directory: %s\n",dir);
    return;
  }

  chdir(dir);

  while((entry = readdir(d)) != NULL)
  {
    lstat(entry->d_name,&statbuf);

    if(S_ISDIR(statbuf.st_mode))
    {
      if(strcmp(".",entry->d_name) == 0 ||strcmp("..",entry->d_name) == 0)
      {
        continue;
      }

      printf("%*s%s/\n",depth,"",entry->d_name);

      printdir(entry->d_name, depth+4);
    }
    else {
      printf("%*s%s\n",depth,"",entry->d_name);
    }
  }

  chdir("..");
  closedir(d);
}

int main()
{
  printf("Scan of current directory:\n");
  printdir(".",0);
  printf("Completed.\n");
```

```
  exit(0);
}
```

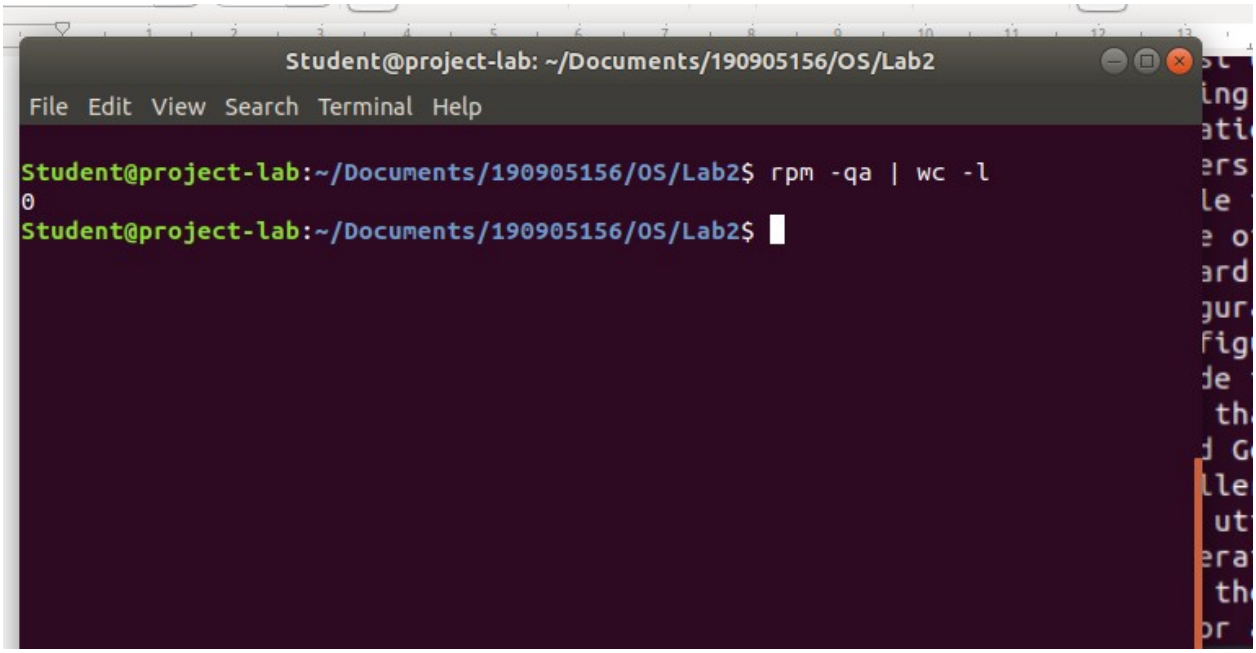


3.) How do you list all installed programs in Linux?



apt list
OR
dpkg –l

4.) How do you find out what RPM packages are installed on Linux?


Student@project-lab: ~/Documents/190905156/OS/Lab2
File Edit View Search Terminal Help
Student@project-lab:~/Documents/190905156/OS/Lab2$ rpm -qa | wc -l
0
Student@project-lab:~/Documents/190905156/OS/Lab2$