ITMO UNIVERSITY

National Research University ITMO

Faculty of Software Engineering and Computer Systems

SYSTEM SOFTWARE FUNDAMENTALS

Lab Work #3 (5, 11)

File Permissions

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Assignment

Create separate shell scripts that output the following information:

1. a list of users who have write access to the given directory;
2. a list of files in the current directory that can be executed by the given user.

Code Listing

Task 1

```
#!/bin/bash

if [ $# -ne 1 ]; then
  echo Usage: $(basename "$0") dir_path
  exit
fi

# Sample stat output: drwxrwxrwx 1000 1000
dir_info=$(stat -c '%A %u %g' "$1" 2>/dev/null)
if [ $? -ne 0 ]; then
  >&2 echo Unable to open $1
  >&2 echo Please ensure the directory exists and you have sufficient permissions
  exit 1
fi

read -r perms owner_uid owner_gid <<< "$dir_info"

if [ ${perms:0:1} != 'd' ]; then
  >&2 echo "$1 is not a directory"
  exit 1
fi

owner_name=$(getent passwd $owner_uid | cut -d: -f1)
owner_group_members=$(getent group $owner_gid | cut -d: -f4 | tr , '\n')

if [ ${perms:1:1} == 'r' ]; then
  echo $owner_name
fi

if [ ${perms:4:1} == 'r' ]; then
  for user in $owner_group_members; do
    if [ "$user" != "$owner_name" ]; then
      echo $user
    fi
  done
fi

if [ ${perms:7:1} == 'r' ]; then
  newline=$'\n'
  owner_and_owner_group_members="${owner_group_members}${newline}${owner_name}"
  for user in $(getent passwd | cut -d: -f1); do
    if ! grep -q "^${user}$" <<< "$owner_and_owner_group_members"; then
      echo $user
    fi
  done
fi
```

Task 2

```bash
#!/bin/bash

if [ $# -ne 1 ]; then
  echo Usage: $(basename "$0") username
  exit
fi

user_uid=$(getent passwd "$1" | cut -d: -f3)
if [ -z "$user_uid" ]; then
  >&2 echo "Unable to find user $1"
  exit 1
fi
user_gids=$(groups "$1" | cut -d: -f2- | xargs getent group | cut -d: -f3)

for file in *; do
  read -r perms owner_uid owner_gid <<< $(stat -c '%A %u %g' "$file")

  if [ ${perms:0:1} == 'd' ]; then
    continue # exclude subdirectories
  fi

  if [ $user_uid == $owner_uid ]; then
    if [ ${perms:3:1} == 'x' ]; then
      echo $file
    fi
    continue
  fi

  if grep -q "^${owner_gid}$" <<< "$user_gids"; then
    if [ ${perms:6:1} == 'x' ]; then
      echo $file
    fi
    continue
  fi

  if [ ${perms:9:1} == 'x' ]; then
    echo $file
  fi
done
```