# Gebze Technical University
# Department of Computer Engineering - CSE 344 System Programming
# Spring 2018-19, HW #1 (Due March 9th @16:00 )
# NO LATE SUBMISSIONS

This HW is based on the " `du` " shell utility. The `du` utility displays the sizes of the subdirectories of the tree rooted at the directory specified by its command-line argument (if no argument is specified it uses the current working directory).

Develop a program named " `buNeDu` " that uses a depth-first search strategy to display the sizes of the subdirectories in a tree rooted at the specified starting path. Your program should at least include :

*(i)* A function named `depthFirstApply` that has the following prototype

```
int depthFirstApply (char *path, int pathfun (char *path1));
```

which traverses the tree, starting at the `path`. It applies the `pathfun` function to each file that it encounters in the traversal. The function returns the sum of the positive return values of `pathfun`, or `-1` (if it failed to traverse any subdirectory)

*(ii)* A function named `sizepathfun` (possibly to use for `pathfun` function defined in section (i*)* ) that has the following prototype

```
int sizepathfun (char *path);
```

The function outputs `path` along with other information obtained by calling `stat` for `path` . The function returns the size in blocks of the file given by `path` or `-1` if path does not corresponds to an ordinary file.

The program `buNeDu` when called with the argument `rootpath` as

```
buNeDu [-z] rootpath
```

with the function calls `sizepathfun` and `depthFirstApply` should output the size of each directory followed by its pathname. When used with no extra arguments the size of the directory does not count the size of the subtrees of that directory. However when additional argument '`-z` ' is introduced the size of the directory contains the sizes of all subtrees that the directory contains (note the difference). If the `pathname` is a specific file, print an informative message but no size. The program outputs the total size of the tree at the end and exits.

When none or meaningless command line arguments are given to the program(s) the output should warn the user and print a usage, informing the user how the program should actually be called.

Your homework will be tested by our test directories and files.

Ask your questions in the Moodle forum "HW1 Questions" by opening a new topic.

Example is given in the next page.

An example:

A (directory)
 |- B (directory)
    |-  kagurachan.exe ( 15 MB )
    |- C (directory)
       |- beware(a special file like smybolic link or pipe) ( 0 KB )
       |- squirtle.pu ( 300 KB )
    |-  gintoki.png ( 3 MB )
 |-  blabla.txt ( 2 MB)
 |-  lalala.exe ( 8 MB )
 |-  D (directory)
 |- beware2(a special file like smybolic link or pipe) ( 0 KB )
 |-  okletsgo.sh (1 MB)

Output of “buNeDu A” gives total sizes:
Special file beware
300 A/B/C
18732 A/B
0 A/D
Special file beware2
29996 A

Output of “buNeDu -z A” don’t add subdirectory sizes:
Special file beware
300 A/B/C
18432 A/B
0 A/D
Special file beware2
11264 A