Homework #1

Question 1 (3 pt.) Shell

Consider the following main program written in C:

```
int main(int argc, char **argv)
{
          print_args(argc, argv);
          return 0;
}
```

Function print_args is a function that returns no value (void), and takes the exact same arguments as function main. Internally, it traverses the array of input arguments given in argv, and containing argc strings, and prints it one by one. For the following command, the main program should provide this exact output, where q1 is assumed to be the program executable:

```
$ ./q1 a b c
argv[0] = './q1'
argv[1] = 'a'
argv[2] = 'b'
argv[3] = 'c'
```

Write the implementation of function print_args and save the full source code for this program in a file named q1.c. You can compile it using command gcc q1.c -o q1, and run it as shown above. Provide file q1.c as an attachment to the homework submission on Blackboard, and make sure that this file can be compiled without any changes.

Question 2 (3 pt.) Shell

Write a C program that displays a prompt on the screen (for example, character '\$'), reads a string from the user, and displays the exact same string when the user presses *Enter*. This process is repeated in an infinite loop, until the user kills the program by pressing *Control+C*.

In order to read the string from the keyboard, use function fgets, passing stdin as its last argument, indicating that the standard input (keyboard) is the device from which the string should be read. Use the man pages to obtain full information about this function.

Notice that fgets will keep the *newline* character ('\n') corresponding to the *Enter* key at the end of the string. Get rid of it by replacing it with a null character ('\0'). Function strlen will be useful here. Here is an example for the program output:

Attach your source code in file q2.c and upload it on Blackboard. The source file should compile with gcc and run correctly on Linux without any modifications.

Question 3 (4 pt.)

Write a C program that creates a child process. The roles of the parent and child process are the following:

- The child process reads an integer value from the keyboard, and returns it as the exit status of the program, either with a return statement in the main function, or with an invocation to function exit.
- The parent process waits for the child process to finish, and prints the child's exit status on the screen, which should be equal to the value read from the keyboard. Read the man pages for function wait to see the details on how to capture the child's exit status.

This is an example of the program output:

Attach your source code in file q3.c and upload it on Blackboard. The source file should compile with gcc and run correctly on Linux without any modifications.