CSE/ISE 337 Assignment 4

Due date: Friday, April 29, at 11:55pm

Important! Must read: (a) When doing assignments, you **must** use the techniques that are described in the lecture notes. You may **not** use methods, modules, packages that were not covered in lectures. (b) Your assignment submission must be entirely your own. You **must** first read the lecture slides "0-Course-Overview.pdf" available in Blackboard – Documents – Lecture Slides, especially Slides 0-9 to 0-14, and follow them. (c) Start working on this assignment right away; you will **not** be able to finish it if you wait until the last day. (d) You **must** provide the commands used to answer each question, your method to find the answers using the command output, and selected output to support your answers, whenever possible.

1. **Simple UNIX commands** (12pts) Login to one allvXX.all.cs.stonybrook.edu machine.
   (a) What shell variety are you using? What is the absolute path name of your home directory? What is your current working directory?
   (b) Read the man page for the `ls` command. How to find out the last modification time of a file that you own using the `ls` command? Specify the file using its *absolute* path name.
   (c) Replace the `ls` in (b) with `date` instead. How to find the last modification time of a file using the `date` command? Specify the file using its *relative* path name.
   (d) Find the day of week of New Year's day (Jan 1) in 2017. Find the date of Mother's Day (second Sunday in May) in 2017.
   (e) What is the command to use to remotely login to another allvXX machine?

2. **UNIX file system access** (12pts) Login to one allvXX.all.cs.stonybrook.edu machine.
   (a) Go to your home directory. Create three subdirectories. What are the file access permissions on these subdirectories you just created? What do the permissions mean?
   (b) Within the first subdirectory that you created in (a), create a new file. What are its file access permissions? When in your home directory, how to display the content of the newly created file?
   (c) When in your home directory, what is a command to clone the entire first subdirectory in (a), including contents of all its subdirectories, if there are any.
   (d) Change the access permission of the first subdirectory in (a), so that when in your home directory, you can't list the content of that subdirectory but can display the content of files in that subdirectory.
   (e) Write a command to remove all subdirectories that you created in (a) and (c), as well as all content within these subdirectories. **Hints**: Read the man page for the `rm` command. Also you may have to change the access permissions for the first subdirectory for `rm` to work.

3. **UNIX shell utilities** (16pts) Login to one allvXX.all.cs.stonybrook.edu machine.
   What does each of the following three commands in (a), (b), and (c) do? Consult the related man pages such as ones for commands `find`, `cat`, `grep`, `tee`, `head`, `wc`, `sort`, etc.
   (a) `find /usr/share/doc -type f -name "*.gz" -size +3k | wc -l`
   (b) `cat boot.log | grep OK | tee ~/log1 ~/337/log1 | head -15`
   (c) `wc -c /var/log/* 2> /dev/null | sort -n > ~/loglog.txt`

(d) How many entries are there in the `/usr/share/doc` directory on the machine? Within them, how many are directories?

4. **Simple scripting** (10pts)

Write a script using simple shell commands that does the following in sequence:

(a) It first prints an empty line, then a line starting with "Today is " that contains the current time and date.

(b) It then prints a line that says "Content of my home directory sorted" and another line that contains 62 dashes only.

(c) It then changes to your home directory, and shows a directory listing of all entries in your home directory in long format sorted by last modification time, with the oldest time on top and newest time at bottom.

(d) It then prints an empty line, and another line that says "There are total xx entries, with yy directories and zz files.", where xx/yy/zz are the total number of entries/directories/files in your home directory respectively.

(e) Finally, it prints a message "Done." in a line, followed by an empty line

Run your script and redirect its output to a file, use it to verify that your script is correct.

5. **HTML and CGI programming** (29pts)

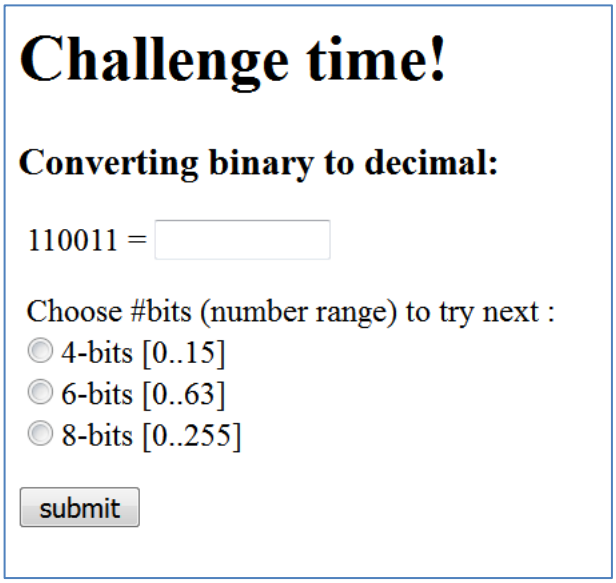
(a) Write a HTML form that asks the user to enter a name, it then invokes a Python program that displays the lyrics for the *Happy Birthday to You* song. E.g., if the input is Henry, the output shown in the response page would be

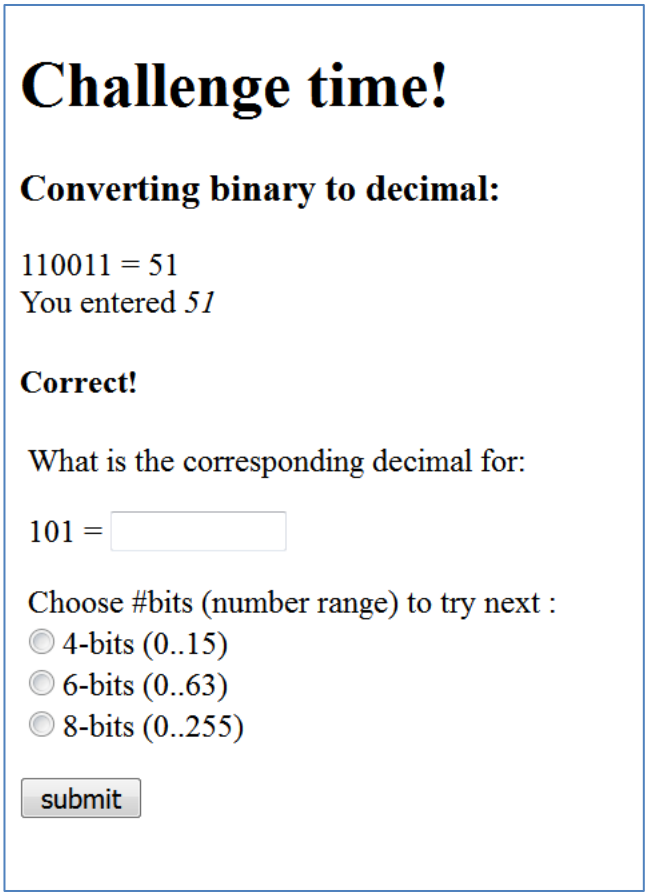
Happy birthday to you,
Happy birthday to you,
Happy birthday dear Henry,
Happy birthday to you.

Name your files `birthday.html` and `birthday.py` respectively. (9pts)

(b) Write a HTML page that contains a HTML form and a corresponding CGI script. Together they implement an online site that provides binary to decimal conversion practices. As shown on the next page, the site randomly generates binary numbers, and prompts the user for corresponding decimal numbers via a text box. Together with each answer, the user also chooses among three number ranges that are implemented using radio buttons, so that the next binary number to practice will be randomly chosen from that range. After the client sends both the decimal answer and the number-range choice to the server by clicking the "submit" button, the server checks the correctness of the answer, replies with the correct answer, a message indicating "Correct!" or "Incorrect", as well as a new binary number to convert within the range that the user chose. Such interaction continues indefinitely. You may arbitrarily choose the binary number to display when a user first accesses the site. Name the HTML file `binary.html`. It should invoke a CGI script at the server called `math.py` that processes the form input.

The figure below on the left side is what a user sees when s/he first accesses the site. The figure below on the right is what the user sees after s/he entered number "51" in the text box and chose the first number range. (20pts)





Deliverables

Your assignment submission should include two files: (a) Answers to all written questions, the commands that you used, the methods to find the answers within output of commands, essential command output that supports each answer, as well as a printout of all programs that you write should be concatenated into a **plaintext** file called "a4-printout.txt". Each answer and program must be clearly labeled with its corresponding question/part numbers or specified file names. (b) A **zip** file that includes all individual programs that you write. Name it "a4-source.zip". You should include certain amount of program documentation, i.e., in-line comments, in your programs for important steps used, and essential instructions on how to run your programs. Do not repeat what the line of code says; rather write comments to help readers to understand your code. (1pt on format)

Important:

- We will use the allv Linux machines to mark your A4.
- If your login shell is not bash, please type "bash" to do this assignment in bash.

Total: 80 points

Submission instructions

The handing-in will be through Blackboard Assignment. The submission instructions are at: http://it.stonybrook.edu/help/kb/creating-and-managing-assignments-in-blackboard.
You **must** read the submission instructions very carefully, and check to make sure your assignment has been submitted correctly **before** the deadline.

You can only submit once! However you can save your work by clicking "Save" as many times as you like. Only click "Submit" after you have checked and are certain that all requirements are followed.

Late submissions will not be accepted. The due date is **11:55pm on Friday, April 29.**