

DOKUZ EYLUL UNIVERSITY

**2018 – 2019
FIRST (FALL) SEMESTER**

**CME 1203
INTRODUCTION TO COMPUTER ENGINEERING**

**ASSIGNMENT 1
LINUX SHELL SCRIPT**

DUE DATE: 09.12.2018, 23:55

**MAKE SURE YOU READ THE DOCUMENT
COMPLETELY PRIOR TO SUBMITTING YOUR
ASSIGNMENT!!!**

GOAL:

In this assignment you are asked to write a shell script.

IMPLEMENTATION REQUIREMENTS:

Your shell script (batch program) will read an input file line by line, do the task accordingly and write the result to an output file. Your script should be dynamic, meaning that there can be various numbers of line in the input file and each line may require a different task. Also names of the input and output files are to be dynamic as well. Meaning that those variables will be parameters of your script. **An example input and output file has been given in appendix.**

The separator between arguments could be **space** or **tab** and it could be only one or more than one. Your program should be able to handle different combinations of both. In the above example, more than one tab is used to make it more readable to the user.

Also, consider the empty lines between numbers, How should they be handled? Should they be preserved in the output file or erased entirely?

A task to be done on each line can be either **base conversion** or one of the arithmetic operations **(+ , - , * , / , %)**.

Base conversion can be between bases **2, 10 and 16**. (Tip**: You may use “bc” console command for conversion between number bases).

In arithmetic operations only unsigned binary operands will be used, meaning every **base 2 number** in the input file will be **positive**.

For **arithmetic operations** you have to do the **operation manually in your code and NOT use a system command** and etc. Write the answer to the output file in the **original number base**, and if the result is in binary (2) or in hexadecimal (16), write down if the answer is positive or negative in parenthesis, as shown in above example and in appendix.

For division and multiplication operations, the divisor and multiplier will be **power of 2 for base 2** and **power of 16 for base 16**.

Your script has to take two mandatory arguments, one is the input file and the other is output file.

The name of your script should be exactly as the following: **YourNumber_YourName_YourSurname.sh**. **Do NOT use Turkish Characters** while naming. Your script should be run as the following:

```
sh 2010510123_Fatih_Dicle.sh inputFile.dat outputFile.dat  
OR  
./2010510123_Fatih_Dicle.sh inputFile.dat outputFile.dat
```

DOCUMENTATION

You do not need documentation for this assignment, however you are expected to **write comments for your code** to make it understandable.

SUBMISSION

Make sure your submission fully covers the following requirements, otherwise you will **lose 30 points**.

Submission will be done via Google Classroom. You are expected to only submit your shell script file named in the following format:

YourNumber_YourName_YourSurname.sh

Submit your assignment only once, you will lose **10 points** for each re-submission. So make sure every checkpoint is accomplished before you submit.

LATE SUBMISSIONS WILL LOSE 10 POINTS FOR EACH DAY.

HONESTY

Your submissions will be scanned among each other as well as the Internet repository. Also some randomly chosen students or all of you may be called to explain your assignments. We strongly encourage you not to submit your assignment rather than a dishonest submission.

FOR QUESTIONS

For any questions about the assignment please comment under the assignment in Classroom. We will try to answer any of your questions as soon as possible, except the ones “Hocam my script does not work, can you fix it” or “I have implemented it but it does not work, can you look at it”.

Search engines are far more suitable options.

Good Luck :)

APPENDIX

1 – GRADING TABLE

GRADING TOPICS AND CATEGORIES		GRADE
USING CORRECT NAME FORMAT FOR SHELL SCRIPT FILE. YOURNUMBER_YOURNAME_YOURSURNAME.SH		7
BASE 2	ADDITION	4
	SUBTRACTION	4
	MULTIPLICATION	4
	DIVISION	4
	MODULUS	4
BASE 10	ADDITION	4
	SUBTRACTION	4
	MULTIPLICATION	4
	DIVISION	4
	MODULUS	4
BASE 16	ADDITION	4
	SUBTRACTION	4
	MULTIPLICATION	4
	DIVISION	4
	MODULUS	4
BASE CONVERSATION	FROM 2 TO 10	4
	FROM 2 TO 16	4
	FROM 10 TO 2	4
	FROM 10 TO 16	4
	FROM 16 TO 2	4
	FROM 16 TO 10	4
HANDLING MULTIPLE SPACES AND TABS BETWEEN INPUT ELEMENTS.		4
WRITING THE SIGN OF BASE 2 AND 16 NUMBERS IN OUTPUT DOCUMENT.		4
HANDLING EMPTY LINES WITHIN INPUT DOCUMENT, BY EITHER ERASING THEM OR PRESERVING THEM.		4
WRITING DETAILED AND EXPRESSIVE COMMENTS IN ENGLISH.		7
TOTAL GRADE (IF IT IS GREATER THAN 100, IT WILL BE REDUCED TO 100)		110
LATE SUBMISSION PENALTY PER DAY		-10
PENALTY PER RE-SUBMISSION		-10
PENALTY FOR CHEATING		-100

2 – EXAMPLE INPUT AND OUTPUT FILE

INPUT FILE:

0b10101010 + 0b101010
0b10101010 – 0b101010
0b10101010 – 0b1010101010
0b10101010 * 0b101010
0b10101010 / 0b101010
0b10101010 % 0b101010

1009 + 503
1009 – 503
1009 – 5030
1009 * 503
1009 / 503
1009 % 503

0xFED + 0xABC
0xFED – 0xABC
0xFED – 0xABCD
0xFED * 0xABC
0xFED / 0xABC
0xFED % 0xABC

0b10101010 2 10
0b10101010 2 16

1009 10 2
1009 10 16

0xFED 16 2
0xFED 16 10

OUTPUT FILE:

0b11010100 (POSITIVE)
0b10000000 (POSITIVE)
0b1000000000 (NEGATIVE)
0b1101111100100 (POSITIVE)
0b100 (POSITIVE)
0b10 (POSITIVE)

1512
506
-4021
507527
2
3

0x1AA9 (POSITIVE)
0x531 (POSITIVE)
0x9BE0 (NEGATIVE)
0xAAF40C (POSITIVE)
0x1 (POSITIVE)
0x531 (POSITIVE)

170
0xAA

0b1111110001
0x3F1

0b111111101101
4077