College of Engineering
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Department of Computer Science and Engineering

# CS232-Free and Open Software Lab

## Final Exam Report

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# 1 . Introduction

The course, Free and Open Source Software Lab under APJ Abdul Kalam Technological University for forth semester Computer Science and Engineering aims at providing exposure for students to FOSS environment and introduce them to use open source packages in open source platform. This is a detailed report on the final lab exam conducted as a completion for the above course for the academic year 2018-19.

## 1.1 Scope

The report goal is to document the approaches and methods used to implement a solution to each of the problem statements in order to draft the best possible output and provide as a material for any future reference regarding the course.

## 1.2 Objectives

The objective is to create a well-structured and documented answer scripts for the final exam questions in order to expose the method use satisfy the completion of the course%.

# 2 . Question I

## 2.1 Problem statement

Write a bash script to find the binary equivalent of a given number.

## 2.2 Theory

The above problem can be solved using Bash script. A shell script can provide a convenient variation of a system command where special environment settings, command options, or post-processing apply automatically.Typical operations performed by shell scripts include file manipulation, program execution, and printing text.

## 2.3 Implementation

1. Input decimal number is read from the user.
2. While the number is greater than or equal to 1 do the following steps.
3. Perform modulo division by 2 on the number and append the remainder to a file .
4. Now, restore the number with its numerical half.
5. After exiting the while loop, reverse print the file and truncate all the white spaces.
6. Clear the file.

### 2.3.1 Commands and Constructs used

‘expr *expression*‘ :evaluates the given arithmetic expression
tac *filename* :reverse print the file contents
The output of tac command is piped to ’tr’ command.
tr ” ” :truncates newlines to single spaces.
rm *filename* : removes the file.

## 2.4 Source code

```
#!/bin/bash
#reading input from user to 'num'
echo "input :"
read num
#binary conversion using modulo method
while [[ $num -ge 1 ]]
do
c1=‘expr $num % 2‘
echo $c1 ¿¿ file.txt #appending remainder digit to a file
num=‘expr $num / 2‘
done #end of while loop
echo "output"
#reverse printing file and truncating white-spaces
tac file.txt — tr " ' '
echo " "
#removing the file
rm file.txt
```

## 2.5 Executing the code

To execute the above code ,  
-open the terminal  
-give the script executable permission using,  
chmod +x script.sh  
-to run type in as : ./script.sh

## 2.6 Sample test runs

```
Input : 8
Output : 1000
Input : 23
Output : 10111
Input : 156
Output : 10011100
```

# 3 . Question II

## 3.1 Problem statement

Given a file containing the marks obtained by students for 3 subjects in an exam. In order to pass, student should score at least 50 marks in every subject. The file has one record(line) for each student in the following format:
roll-number subject1 subject2 subject3 Using a scripting language, print pass/fail status of each student in the following format: roll-number pass/fail

## 3.2 Theory

The above problem can be solved using the features provided by awk scripting language. Awk is basically a scripting language mainly used for text processing and to produce formatted reports. Awk commands are applied sequentially on input. By default awk execute on every line but this can be restricted by providing patterns.

## 3.3 Implementation

1. Given file.txt contain several lines of testcases. provide the filename via commandline.
2. Extract the second, third and forth columns of each line and perform comparison.
3. Check if each of the marks per line is greater than or equal to 50.
4. If so , then print the corresponding rollno. and a message ’pass’.
5. Else , then print the corresponding rollno. and a message ’fail’.

### 3.3.1 Commands and Constructs used

The code contains only a body block that executes for each line in the file provided.
$1 extracts the first word ,$2 the second,$3 the third and $4 the forth word respectively.
print command is used to print the output. if..else block is used to check the condition.

## 3.4 Source code: script.awk

```
#!/usr/bin/awk -f
{
if ($2 ¿= 50  $3 ¿= 50 && $4 ¿= 50)
print $1 ” pass” ;
else
print $1 ” fail” ; }
```

## 3.5 Executing the code

To execute the above code ,
-open the terminal
-type in as : awk -f script.awk file.txt

## 3.6 Sample test runs

Input file content:

```
TVE17CS001 12 32 88
TVE17CS002 87 61 89
TVE17CS015 70 31 56
TVE17CS021 90 98 78
TVE17CS010 50 69 81
TVE17CS003 41 71 20
```

Ouput :

```
TVE17CS001 fail
TVE17CS002 pass
TVE17CS015 fail
TVE17CS021 pass
TVE17CS010 pass
TVE17CS003 fail
```

# 4 . Question 3

## 4.1 Problem statement

Implement PHP application that asks a random question(from a given set) to the user and evaluates if the users answer is correct.

## 4.2 Theory

The above problem can be implemented in PHP .PHP is a server side scripting language that is used to develop Static websites or Dynamic websites or Web applications. PHP stands for Hypertext Pre-processor, that earlier stood for Personal Home Pages. PHP codes are processed before sending them to the browser.

## 4.3 Implementation

1. A simple html page is set up with title 'quiz'
2. Within the php tag a file is opened with specified filename.
3. Each line from file is read from the file operation commands.
4. Submit answer from the form using post method
5. The value if then checked with actual answer string , if they are equal then print message 'correct' ,else print 'incorrect'.

### 4.3.1 Commands and Constructs used

¡form¿ :create an HTML form for user input.
method attribute :The method attribute specifies how to send form-data (the form-data is sent to the page specified in the action attribute).
post method:The POST method transfers information via HTTP headers. The information is encoded as described in case of GET method and put into a header called

QUERY-STRING.
fopen :Opens file or URL
fgets :Gets line from file pointer
fclose :Closes an open file pointer

## 4.4 Source code: quiz.php

```
¡?php
echo ”GIVE ME ANSWER”
?¿
¡html¿
¡head¿
¡title¿QUIZ¡/title¿
¡/head¿
¡p¿
¡?php
#opening file qa.txt and reading a line from it
if ($fh = fopen(’qa.txt’, ’r’)) {
$line = fgets($fh);
echo $line;
fclose($fh);
}
?¿
¡p¿
¡form method=”post” action=”test.php”¿
¡input type=”text” name=”answer”¿¡br¿
¡input type=”submit” name=”submit” value=”answer”¿
¡/form¿
¡?php
if($_POST[’answer’]==”Antoine Lavoisier”)
echo ”Correct”;
else
echo ”Incorrect”;
?¿
¡p¿
¡?php
if ($fh = fopen(’qa.txt’, ’r’)) {
$line = fgets($fh);
echo $line;
fclose($fh);
}
?¿
¡/p¿
¡form method=”post” action=”test.php”¿
¡input type=”text” name=”answer”¿¡br¿
¡input type=”submit” name=”submit”¿
¡/form¿
¡?php
if($_POST[’answer’]==”Dmitri Mendeleev”)
echo ”Correct”;
else
echo ”Incorrect”;
?¿
¡/html¿
```

## 4.5 Executing the code

To execute the above code ,<br>
-open the terminal<br>
-run the php : php quiz.php<br>
-create localhost: php -S localhost:2000<br>
-view the php in browser

# 5 . Conclusion

I hereby conclude that the above outputs were obtained for the corresponding problem statements to the best of my knowledge . The source codes to the first and second output worked successfully for all the test-cases given. The third solution worked to give a successful output of 90% apart from that it failed to take random questions from the file given one at a time.

# 6 . Declaration

I hereby, declare that I have sincerely completed all the lab assignments and attended the viva-voice and final exam for the fulfillment of the course,CS232 Free and Open Source Software Lab , and effectively worked towards the achievement of the course outcomes.

# 7 . Gratitude

I would like to express my sincere thanks to Thania Kumar, Vipin Vasu, Remya Krishnan and Sakhi S Anand for giving me proper guidance and help,and all lab assistants, Mtech students and classmates for their kind support and effort to clear my doubts .