

Unix Shell Programming

Simple scripts

Assignment #1

Prime or composite?

A prime number (or a prime) is a natural number greater than 1 that is not a product of two smaller natural numbers. A natural number greater than 1 that is not prime is called a composite number. For example, 5 is prime because the only ways of writing it as a product, 1×5 or 5×1 , involve 5 itself. However, 4 is composite because it is a product (2×2) in which both numbers are smaller than 4.

Write a shell script to accept a number from the user between 1 to 10000 and print if it is a prime number or not.

Assignment #2

Date validation

Write a shell script that accepts 3 numbers for **day**, **month** and **year**. Check if the combination of them forms a valid date or not. Keep a check on leap year as well.

For example,

- year=2018, month=13, day=1 is an invalid date as the possible values for month is 1 to 12.
 - year=2018, month=2, day=29 is an invalid date as the maximum days in February is 28 in the year 2018
 - year=2016, month=2, day=29 is a valid date.
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Assignment #3

Leap year check

Write a shell script that accepts a number from the user between 1 and 9999. The script should print if the number input is a leap year or not. Display appropriate error message for invalid inputs.

Assignment #4

Fibonacci

In mathematics, the Fibonacci numbers are the numbers in the following integer sequence, characterised by the fact that every number after the first two numbers is the sum of the two preceding ones:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, ...

Write a shell script that accepts a value for index (≥ 0) and prints the fibonacci number at that index.

For example, for **index=7** the output should be **13**

Display appropriate error message for invalid input.

Assignment #5

Triangle pattern

Write a shell script to accept a number **rows** and print the following pattern.

```
*
**
***
****
*****
```

The number of rows should be based on the value of a variable "rows" which is accepted from the user, and the number of stars in a row is based on the row number itself.

Assignment #6

Sine of an angle

In trigonometry, the Sine of an angle in **radians** is represented by the series below:

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots = \sum_{n=0}^{\infty} \frac{(-1)^n x^{2n+1}}{(2n+1)!}$$

Write a shell script that accepts angle in **degrees** and prints the sine of the given angle.
