In The Name of God

Shiraz University

Fundamentals of Computer Programming

Assignment #3

Due Time: October 25, 2016, 23:55

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1. Write an algorithm that takes 2 integers as input and saves them into two variables, then swaps those variables (exchanges their values) **without using any extra variable**.

   (There is a simple way for swapping in python. If you are interested to learn more, just GOOGLE it.)

2. Write an algorithm that outputs Fibonacci numbers less than 10^6.
   (Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, …)

3. Write an algorithm that takes a number as input and outputs all of its divisors.

   ```
   Input:
    >>> 24


   Output:
     1  2  3  4  6  8  12  24
   ```

4. Square of n, a positive integer, can be calculated by sum of n sequential odd integers starting from 1. Write an algorithm that takes an integer as input and calculates its square using the mentioned method.

```
Input:

 >>> 6


Output:

  36

(Note: 1 + 3 + 5 + 7 + 9 + 11)
```

Write python programs for the following questions.

5. Write a python program that takes two dates as input and calculates the number of days between them.
   Note: The first 6 months have 31 days and the second 6 months have 30 days.

```
Input:

Enter first date day

>>> 17

Enter first date month

>>> 10

Enter second date day

>>> 28

Enter second date month

>>> 5


Output:

  141
```

6. Assume we have unlimited numbers of 50, 20, 10, 5, 2 and 1 dollar's coins. Write a python program that takes a price as input and calculates the minimum number of coins required to pay that price.

>>> 178

7

(Note: 3 $50 coins, 1 $20 coin, 1 $5 coin, 1 $2 coin and 1 $1 coin.)

>>> 36

4

(Note: 1 $20 coin, 1 $10 coin, 1 $5 coin and 1 $1 coin.)