NANYANG TECHNOLOGICAL UNIVERSITY

~~SEMESTER 1 EXAMINATION 2016-2017~~ Suggested Solutions

MH1401/CY1401 - Algorithms and Computing I

<u>NOTE:</u>

1. The following paper has been converted from MATLAB to Python.

Contents

Questions

QUESTION 1

(a) How do you check that an input `x` given by a user is a positive integer?

(b) Given vec=[1 0 3 0], what you be the result of the following command:
`any(vec) && all(vec)`

(c) Given the matrix
$$mat = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$$
what is the result of the following command:
`np.sum(mat[1,3]*mat[1,:]))`

(d) Rewrite the following `if-elif` statement as a ~~switch~~ **nested** `if-else` statement that accomplishes exactly the same thing. Assume that `x` is an integer variable that has been initialised and the function `f(x,d)` is defined.

```
if x < -3 or x >= 3:
    y=f(x,1)
elif x > 0:
    y=f(x,2)
elif x < 0:
    y=f(x,3)
else:
    y=f(x,4)
```

QUESTION 2

In Singapore, personal income tax rates for resident taxpayers are progressive. This means higher income earners pay a proportionately higher tax, with the current highest personal income tax rate at 20%.

Suggested Solutions (Brandon)

Suggested Solutions (Camille)