IALP 2011 – Octave TP4

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MIEET 1º ano

Exercise 1: Evaluate the following expressions in Octave:

a) `5.5 >= 5`

b) `20 > 20`

c) `xor(17 - pi < 3, pi < 3)`

d) `true > false`

e) `~~(35/17) == (35/17)`

f) `(7 <= 8) == (3/2 ==1)`

g) `17.5 & (3.3 >2.)`

Exercise 2: Evaluate the following expressions in Octave:

a) `3 > 5`

b) `3 > 5 | 5 > 3`

c) `3 > 5 | 5 < 3`

d) `xor(3 > 5, 5 > 3)/2` (See note 1)

e) `3 > 5 | 5 < 3 + 5`

f) `3 > 5 | (5 < 3) + 5` (where does the computer effectively add parenthesis?)

g) `(3 > 5 | 5 < 3) + 5`

h) `(3 > 5 | 5 > 3) * 5 + 3` (See note 1)

l) `xor(3 > 5, 5 > 3) + 5` (See note 1)

j) `5 > 3 & 5`

k) `5 > 3 & 5 + 3`

l) `(5 > 3 & 5) + 3` (See note 1)

m) “To be or not to be?”: `(2==b) | !(2==b)`

Note 1: The exercises d, h, i and l are examples of mixed algebra (Boolean and Integer). **Never** make such constructions in your programs!
Note 2: It is always allowed to add extra parenthesis to avoid doubt.

Exercise 3: Evaluate the following expressions in Octave:

a) `1 == (3+2)`

b) `(1 == 3)+2` (See note 1 above)

c) `3+2 > 4 == 1`

d) `~1 == 0 < 4`

e) `4 < 0 == ~1`

f) `4 < 0 == 1`

g) `1 == 1 == 1+1`

h) `1 == 1 == 1-1`

i) `1 + 1 & 1-1`

j) `1 + 1 | 1-1`

k) `1 + 1 | 1-1 > 1`

l) `(1 + 1 | 1-1) > 1`

m) `xor(1 + 1, 1-1)`

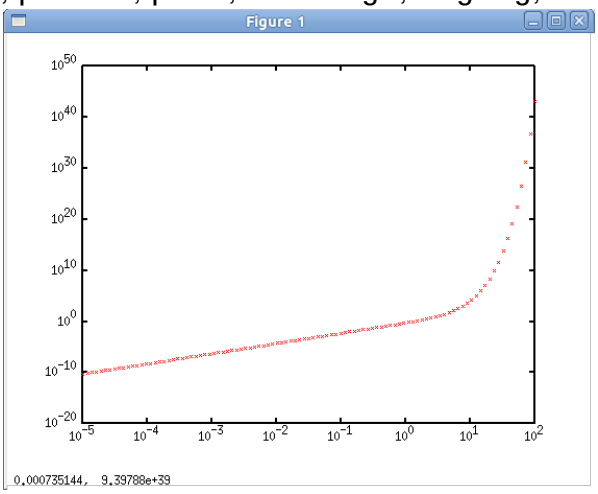
n) `xor(1 + 1, 1+1)`

o) `xor(1 + 1, 1)`

Exercise 4: Octave has many predefined functions embedded, just like scientific calculators. Use the function `exp` to implement the following function

$$f(x)=\frac{e^{x}+e^{-x}}{2}-1$$

a) Write a program that calculates the function of *f*(*x*) for a value given by the user. Test the program with values 10^{-5}, 10^{-4}, 10^{-3}, 10^{-2}, 10^{-1}, 10^{0}, 10^{1}, 10^{2}.
Try to display the output in a meaningful format.
b) Plot the function between x = -10 and x =10 in a linear scale with 101 points
c) (Difficult:) Plot the function on a *logarithmic* scale, from 10^{-5} to 10^{2} with 101 points.
Useful functions: `input`, `printf`, `plot`, `semilogx`, `loglog`, `linspace`.



Exercise 5: Write an Octave script that tells the user if the body temperature is too high or not
If the temperature is less than 36.4 degrees: Show text “Too low temperature”
If the temperature is between 36.4 and 37.5 degrees: Show text “Normal temperature”
If the temperature is between 37.5 and 39.4 degrees: Show text “Slight fever”
If the temperature is higher than 39.4 degrees: Show text “High fever. See doctor”

Useful functions: `input`, `disp`