Laboratory Assignment 1 – Octave & Statistics – Answers

DAVD05 – Performance Modelling & Simulation

2008-01-28

The following document contains all the answers to the first laboration. If you suspect errors in this document, please inform me. // Per (`per.hurtig@kau.se`)

Exercise A: The "torrent" assignment

1. `mean([4 7 6], ''h'')/3 = 1.7872` hours.
2. `mean([29 25 26 100])*4*3600 = 648000` Kbyte.

Exercise B: The `ping` assignment

1. `x = load labdata.dat; mean(x)/2 = 56.89` ms, if the end-to-end delays are symmetric.
2. `mode(x) = 108` ms.
3. `std(x) = 6.8382` ms.
4. Display it in some appropriate graphical way (e.g. `hist(x)`).
5. Your own interpretation of 4 (e.g. the RTT samples in the set are relatively stable).
6. `tput(mean(x), 0.01)*1000 = 107.64` pkts/s, when `tput(RTT, p)` is defined as:

```
function [tp] = tput(rtt,p)
  tput = 1./rtt .* sqrt(3./(2.*p));
endfunction
```

7. `tput([mean(x)+std(x), mean(x)-std(x)], 0.01)*1000 = [101.54;114.53]` pkts/s.
8. For example: `xrange = [1:10]/100; plot(xrange, tput(mean(x), xrange))`.

Exercise C: The TCP assignment. Start by loading the data: `load labdata2.dat; x1=labdata2(:,1); x2=labdata2(:,2);`. Then create a function similar to this:

```
function [c1, c2] = confFunc(x, clevel)
  alpha = 1 - clevel;
  p = 1-alpha/2;

  if length(x) > 29
    df = inf;
  else
    df = length(x) - 1;
  end

  c1 = mean(x) - tinv(p,df) * (std(x)/sqrt(length(x)));
  c2 = mean(x) + tinv(p,df) * (std(x)/sqrt(length(x)));
endfunction
```

1. `[c1, c2] = confFunc(x, 0.90) = [113.42;114.13]`.
2. `[c1, c2] = confFunc(x, 0.95) = [113.35;114.20]`.
3. The probability that a certain number lies within a larger interval is higher.
4. `[c1, c2] = confFunc(x1, 0.95) = [5437.6;6900.3]`.

5. `numTry(x1, 0.03, 0.95) = 1095.6` , where `numTry(x, error, clevel)` is defined as:

```
function n = numTry(x,err,clevel)
  alpha = 1 - clevel;
  p = 1 - alpha/2;
  err = err/2;
  a = tinv(p,inf)*std(x);
  b = err*mean(x);
  n = (a/b)^2
endfunction
```

6. `[c1, c2] = confFunc((x2-x1), 0.95) = [-249.19;61.687]`. Interval contains zero. Thus, no statistical significance.

Exercise D: The ANOVA assignment

1. Use the built-in `anova` function to check your answer.

Exercise E: The Fibonacci assignment

Have not calculated this one. Inform me! :D