**Introduction to CL SS 16 - Homework Assignment 1 - Solutions**

Must not be handed in individually but **by workgroup** (join a workgroup with two other members of your tutorial group). Each submission must contain the names of all workgroup participants.
Identical solutions from different workgroups will not receive credit (so don't copy the solutions from other workgroups and don't allow others to copy your solution).
Pls. hand in in the form of a PDF document sent to your tutor by email.

**1. Regular expressions & FSAs**

a.
Write a RE accepting the language that consists of the set comprising all 4 different forms of Peter Bosch's UOS email address:

{pbosch@uos.de, peter.bosch@uos.de, pbosch@uni-osnabrueck.de,
peter.bosch@uni-osnabrueck.de}

b.
Find an FSA for the language given by the RE /(ab*)+/ . Define this FSA in the format of a formal definition as a 5-tuple, as e.g. on slide 35 of the 2nd lecture.

c.
Define the same language by means of a regular grammar, as e.g. on slide 37 of lecture 2.

## 2. English consonants

If your native language is not English, or you are uncertain as to your pronounciation, you are advised to consult the phonetic transcriptions in a dictionary. In any case of doubt, the intended pronunciation is RP (i.e., "BBC English").

a.
The words in the left-hand column below *begin* with 22 different consonants. The words in the right-hand columns begin with the same 22 consonants, but in a different order. Match each word on the left with the word on the right which has the same initial consonant (sound, not letter), and write down the solutions as pairs of letters and numbers, e.g."k2".

| | | | | |
|---|---|---|---|---|
| a | tomato | | 1 | bag |
| b | Czech | | 2 | cat |
| c | yacht | | 3 | cent |
| d | loose | | 4 | check |
| e | there | | 5 | dude |
| f | guess | | 6 | fan |
| g | chef | | 7 | gas |
| h | dare | | 8 | gem |
| i | vote | | 9 | leap |
| j | kneel | | 10 | meek |
| k | kite | | 11 | nail |
| l | holy | | 12 | pain |
| m | pest | | 13 | ptomaine |
| n | phone | | 14 | room |
| o | jest | | 15 | shave |
| p | zest | | 16 | then |
| q | send | | 17 | thick |
| r | rhyme | | 18 | vest |
| s | main | | 19 | weight |
| t | thin | | 20 | whole |
| u | boom | | 21 | young |
| v | wild | | 22 | zoom |

**contd.**

b.
The words in the left-hand columns below *end* with 21 different consonants. The words in the right-hand columns have the same final consonants, but in a different order. Match each word on the left with the word on the right which has the same final consonant and write down the solutions as pairs of letters and numbers, e.g. "c4".

| | | | | |
|---|---|---|---|---|
| a | love | | 1 | both |
| b | rogue | | 2 | car |
| c | dome | | 3 | clothe |
| d | grub | | 4 | dumb |
| e | smooth | | 5 | fate |
| f | ridge | | 6 | globe |
| g | sane | | 7 | graph |
| h | beige | | 8 | lace |
| i | lung | | 9 | look |
| j | gruff | | 10 | odd |
| k | eight | | 11 | phrase |
| l | fade | | 12 | pole |
| m | toll | | 13 | rage |
| n | daze | | 14 | rich |
| o | lock | | 15 | rouge |
| p | loss | | 16 | rug |
| q | hope | | 17 | save |
| r | youth | | 18 | sign |
| s | care | | 19 | soap |
| t | ash | | 20 | tongue |
| u | witch | | 21 | wash |

**contd.**

c.
This time match the *final* consonant of each word in the left-hand columns with the *initial* consonant of a word in the right-hand columns - **if there is such a match**. Write down the solutions as pairs of letters and numbers,  e.g., "a3". If there is no match write "x –".
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| | | | | |
|---|---|---|---|---|
| a | pitch | 1 | beige |
| b | team | 2 | breathe |
| c | kill | 3 | chip |
| d | bad | 4 | coach |
| e | dame | 5 | comb |
| f | goal | 6 | cough |
| g | choke | 7 | door |
| h | jell | 8 | face |
| i | fun | 9 | lane |
| j | think | 10 | ledge |
| k | safe | 11 | lick |
| l | vain | 12 | maid |
| m | they | 13 | meat |
| n | zone | 14 | nave |
| o | mode | 15 | nose |
| p | name | 16 | robe |
| q | lace | 17 | rogue |
| r | rake | 18 | rung |
| s | yell | 19 | rush |
| t | wet | 20 | Ruth |
| u | head | 21 | sail |
| v | shift | | |