Exam Introduction to Scientific Programming 2018

A **flashcard** is a card bearing information, as words or numbers, on either or both sides, used in classroom drills or in private study. One writes a question on a side and an answer overleaf. Flashcards can bear vocabulary, historical dates, formulae or any subject matter that can be learned via a question-and-answer format. Flashcards are widely used as a learning drill to aid memorization. They are often associated with spaced repetition, i. e. reviewed at expanding time intervals.

Flashcards can be virtual or physical.

A flashcard consists on a number of index cards and five boxes. On every index card there is a question, a tip and the answer. Every index card is put in one of the boxes.

The **Leitner system** is a widely used method of efficiently using flashcards that was proposed by the German science journalist Sebastian Leitner in the 1970s.

In every round 15 index card will be selected from the boxes and the question on it must be answered. Is the answer correct, the index card will be putted in the next box or remains in the box 5 if is is already in it. If the question can be answered only with the help of a tip, it remains in the box. Is the answer wrong, the card goes to box number one If all questions in box number five, the round is finished.

Every round of the flashcard game will be initialize by the following scheme:

- 15 card to be chosen
- 5 cards from box 1
- 4 cards from box 2
- 3 cards from box 3
- 2 cards from box 4
- 1 cards from box 5
- Contains a box lesser questions a should be taken from it, it will be filled with questions from the next box with a smaller number. This procedure may be continued. Are all cards from the all boxes in use, take card from the next box with a higher number.

Example:

Box #	1	2	3	4	5
Number of card in the box	3	3	10	1	10
Number of card actually taken from the box	3	3	7	1	1

Implement a virtual flashcard game using object-oriented programming in MATLAB. Design a graphical user interface for your program. The program should be able to read questions from a data base. From the data base the program should define a round of the learning game. The user should be able to answer the question directly or to answer with the help of a tip. In contrast to the original flashcard game, where the decision if an answer is right or wrong remains in the hand of the user, the program should use a multiple choice test. This leads to a modification: On every virtual card is the question, a tip and three to five answers, where only one is correct.

You have also to write a data base for the program. The questions may be related with your master program or can be chosen by your interests.

The documentation should describe the use of your program. In a second part (technical documentation), you should describe the used algorithm and also the format of the data base.

You have 8 weeks for writing the program and the documentation.

It starts on May, 1st 2018.

If you need help, please contact us by email uwe.pruefert@math.tu-freiberg.de or matthias.braendel@math.tu-freiberg.de .