

## **i General Information DAT505**

### **Introductory course in programming**

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If you are working on a computer through Inspira, then paste your solution in the text field under the description for each question. It is also possible to submit by writing down the solution on paper. The latter is an option even if you use a computer to test your code but for technical reasons you are not able to submit via Inspira.

It is not necessary to comment on your code, it is more important that the code is clean and easy to read.

On the computer, you can use a text editor and the Python interpreter to test your code. Using integrated development environments like VSCode and PyCharm is also an option. Using anything else, especially chat, mail, social media or other tools for communication, during the exam, will be considered cheating.

The total number of points is 40. 13 points correspond to grade 3, 24 points correspond to grade 4, and 35 points correspond to grade 5.

## 1 Question 1

The blood pressure is characterized by two numbers - called systolic and diastolic pressure. Depending on the combination of these two number the pressure is characterized as low, ideal, pre-high and high. The rules are as follows:

- low: systolic < 90 and diastolic < 60
- ideal: systolic < 120 and diastolic < 80
- pre-high: systolic < 140 and diastolic < 90
- high: systolic < 190 and diastolic < 100

Write a program which interacts with the user and asks for his/her blood pressure. After that it prints for its status according to the rules above. If either of the values is negative or outside of the ranges prescribed above, then print an error.

Examples:

Systolic pressure: 115  
Diastolic pressure: 75  
Your blood pressure is ideal

Systolic pressure: 150  
Diastolic pressure: 90  
Your blood pressure is high

**(10 points)**

**Skriv in ditt svar här**

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Totalpoäng: 10

## 2 Question 2 DAT445/DAT505

When people create new crosswords, then need to find a new word with a given length and with certain letters at certain positions in the word. The file "words.txt" contains a list of words (one per line). For example:

```
apple
orchard
sun
skyscraper
pun
```

Write the function:

```
def findMatch(pattern):
    ...
```

which returns the list of words from "words.txt" matching the pattern. The pattern is a string containing spaces and letters. A space in the pattern matches any letter in the word. If the pattern contains a specific character then the same character must appear in the search word at the same place. The length of the word must be the same as the length of the pattern. For example:

```
>>> findMatch("a _ _ le")
["apple"]
>>> findMatch("or _ _ a _ d")
["orchard"]
>>> findMatch("or _ _ t")
[]
>>> findMatch("_ _ un")
["sun", "pun"]
```

**(15 points)**

**Skriv in ditt svar här**

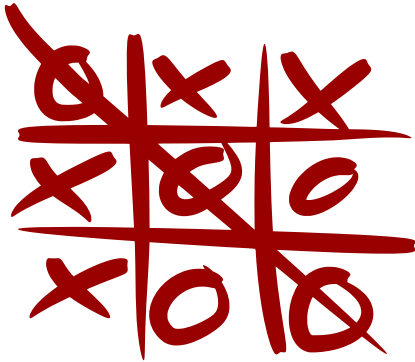
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Totalpoäng: 15

### 3 Question 3 DAT445/DAT505

Implement the class TicTacToe which models the state of the famous game:



The class must have the following components:

- An `__init__` method which initializes the state of the game, i.e. a 3 by 3 matrix where all cells are empty. It must also set that the first player plays with "x".
- A method:  
`def play(self,row,col):`  
...  
which fills an empty cell at the given row and column with either "x" or "o" depending on the current player. If the cell is not empty then the cell remains unchanged and the method returns False. In all other cases the result is True and after the call, the players change turns.
- A method:  
`def gameOver(self):`  
...  
which returns True/False depending on whether the game is over. The game is over if there is at least one row, column or diagonal filled in with one and the same symbol.

(15 points)

Skriv in ditt svar här

1

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Totalpoäng: 15