

# Programmering og Problemløsning

## Datalogisk Institut, Københavns Universitet

### Arbejdsseddel 12 - gruppeopgave

Jon Sparring

2. januar - 10. januar.  
Afleveringsfrist: fredag d. 10. januar kl. 17:00.

Emnerne for denne arbejdsseddel er:

- objektorienteret programmering

Opgaverne er delt i øve- og afleveringsopgaver. I denne periode skal I arbejde i grupper med jeres afleveringsopgaver. Regler for gruppe- og individuelle afleveringsopgaver er beskrevet i ”Noter, links, software m.m.” → ”Generel information om opgaver”.

## Øveopgaver

12ø0 Write a Person class with data properties for a person’s name, address, and telephone number. Next, write a class named Customer that is a subclass of the Person class. The Customer class should have a data property for a customer number and a Boolean data property indicating whether the customer wishes to be on a mailing list. Demonstrate an instance of the Customer class in a simple program.

## Afleveringsopgaver

Sparring, “Learning to program with F#”, 2017, Chapter 21.4 describes a simplified version of Chess with only Kings and Rooks, and which we here will call Simplechess, and which is implemented in 3 files: `chess.fs`, `pieces.fs`, and `chessApp.fsx`. In this assignment you are to work with this implementation.

12g0 The implementation of `availableMoves` for the King is flawed, since the method will list a square as available, even though it can be hit by an opponents piece at next turn. Correct `availableMoves`, such that threatened squares no longer are part of the list of vacant squares.

- 12g1 Extend the implementation with a class `Player` and a derived class `Human`. The intention is to prepare for a future derived class `Computer`, not to be implemented at the moment. The derived classes must have a method `nextMove`, which returns a legal movement as a codestring or the string “quit”. A codestring is a string of the name of two squares separated by a space. E.g., if the white king is placed at a4, and a5 is an available move for the king, then a legal codestring for moving the king to a5 is “a4 a5”. The codestring (for humans) is obtained by a text dialogue with the user.
- 12g2 Extend the implementation with a class `Game`, which includes a method `run`, and which allows two players to play a game. The class must be instantiated with two player objects either human or computer, and `run` must loop through each turn and ask each player object for their next move, until one of the players quits by typing “quit”.
- 12g3 Make an extended UML diagram showing the final design including all the extending classes.

Afleveringen skal bestå af

- en zip-fil
- en pdf-fil

Zip-filen skal indeholde en `src` mappe og filen `README.txt`. Mappen skal indeholde fsharp koden, der skal være en fsharp tekstfil per fsharp-opgave, og de skal navngives `12g0.fsx` osv. De skal kunne oversættes med fsharpc og den oversatte fil skal kunne køres med mono. Funktioner skal dokumenteres ifølge dokumentationsstandard. Filen `README.txt` skal ganske kort beskrive, hvordan koden oversættes og køres. Pdf-filen skal indeholde jeres rapporten oversat fra L<sup>A</sup>T<sub>E</sub>X.

God fornøjelse.