8 Further Human–Computer Interaction (afb21)

Predictive text entry systems are familiar on touch screens and mobile phones. This question asks you to consider how the same principles might be used in a programming editor for creating Java code.

(a) Explain using Bayes’ Theorem how such an editor might update its expectation about which identifier will appear next, as the programmer is typing a line of code. Your answer should include a short extract of Java code preceding this line, in order to illustrate the context in which the expectation is being calculated. [5 marks]

(b) Describe how you could obtain an empirical measurement of the actual improvement in efficiency that results from using this predictive editor in practice. [5 marks]

(c) Consider the four possible combinations of a) small versus large variance, and b) small versus large effect size, in repeating this measurement. For each combination, explain the practical interpretation of that data for future development of the programming editor. [5 marks]

(d) If programmers have the option of whether or not to turn on this new function in the editor, describe some of the factors that might influence their decision-making process, with specific reference to the cognitive processes and sources of information that they would use. [5 marks]