Software Engineering II 2004 – Paper 2 Question 1(c)

Describe two particular features of ML and two (different) features of Java that might be expected to help the process of designing, implementing, debugging or maintaining high quality programs in a cost effective manner. Explain whether the features you have noted are ones that come into play for all users or if they are capbilities that a user can choose to use or to ignore. [4 marks]

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The responses can clearly be pretty free-form, but ones
I would expect most people to select from would include

ML
(a) Lack of side-effects in (most) code make reasoning
about it easier;
(b) The polymorphic type-reconstruction gives good
security with low programmer overhead
(c) The language abstracts well above machine-specific
detail
(d) Good support for higher order functions makes it
possible to abstract and hence have re-usable code for
things like map, filter, foldr etc

Java
(a) The Object Oriented structure with classes and
public/private etc visibility provides a major tool
for structuring large bodies of code
(b) Packages reduce the risk of name-clashes and hence
confusion between user code and libraries, etc
(c) Existing rich libraries often give the programmer a
head start compared to the use of a system where
everything had to be coded from scratch
(d) The Java Virtual Machine provides a protected closed
world which is insensitive to underlying hardware, where
use of null references, array bound violations etc etc
are all routinely policed, preventing system damage or
delayed bug-consequences.
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