

4.1

- (a) Ocaml uses type inference, and therefore does not require that types be declared before use.
- (b) Operator overloading is not permitted in Ocaml for any types, including programmer defined types.
- (c) The size of an array is bound at runtime, but it may not be altered once allocated.
- (d) A new scope may only be defined by 'let' or a function definition.
- (e) Let statements may be nested in other let statements, nesting scopes. Let statements are also permitted inside function definitions, again nesting scopes.

4.2

- (a) In the top level interactive mode, all let bindings are global. In compiled files, one can define variables in a struct and reference them using dot notation provided the struct's signature specifies that the variable is visible outside of the definition.
- (b) Similarly, the signature can define variables in a struct be obfuscated from sight outside of the struct itself.
- (c) You might want a variable to be in a file which is globally visible, but you may not want the variable to be visible.

4.3

A declaration is naming a variable or a function but not assigning it a value or any implementation. No memory is allocated for a declaration. A definition assigns a value to a variable name or an implementation to a function, allocating a space in memory of size defined by the declaration.

Declaration:

```
int x;
```

Definition:

```
x = 10;
```

4.4

Header files are files included in compilation by the compiler. They may contain referenced classes, variables or functions required by the program being compiled. Java uses packages and jar files instead of header files.

5.1

Basic Ocaml types: int – 32 bit and 64 bit
float – 32 bit and 64 bit
bool – 8 bit
character – 8 bit
array
list

5.3

Ocaml boolean expressions are evaluated left to right. One can convert a boolean to a string, and a string to a integer.

5.9

On Big Endian architecture, the most significant digit is stored first or leftmost in memory, while on Little Endian architecture, the least significant digit is stored first. Most PCs implement Little Endian architecture while mainframe computers are more likely to implement Big Endian architecture.

5.16

There is no native support of dynamic arrays, but there is a module in a publicly available library which allows growing and shrinking arrays after they have been defined. The module is called `Data.Mutable.Dynarray`.

5.17

A hash array, or an associative array, is a collection of pairs of the form (hash, value). In Ocaml, one could build a hash array using the record type, using two lists as properties. The first list represents the hash while the second list represents the value.