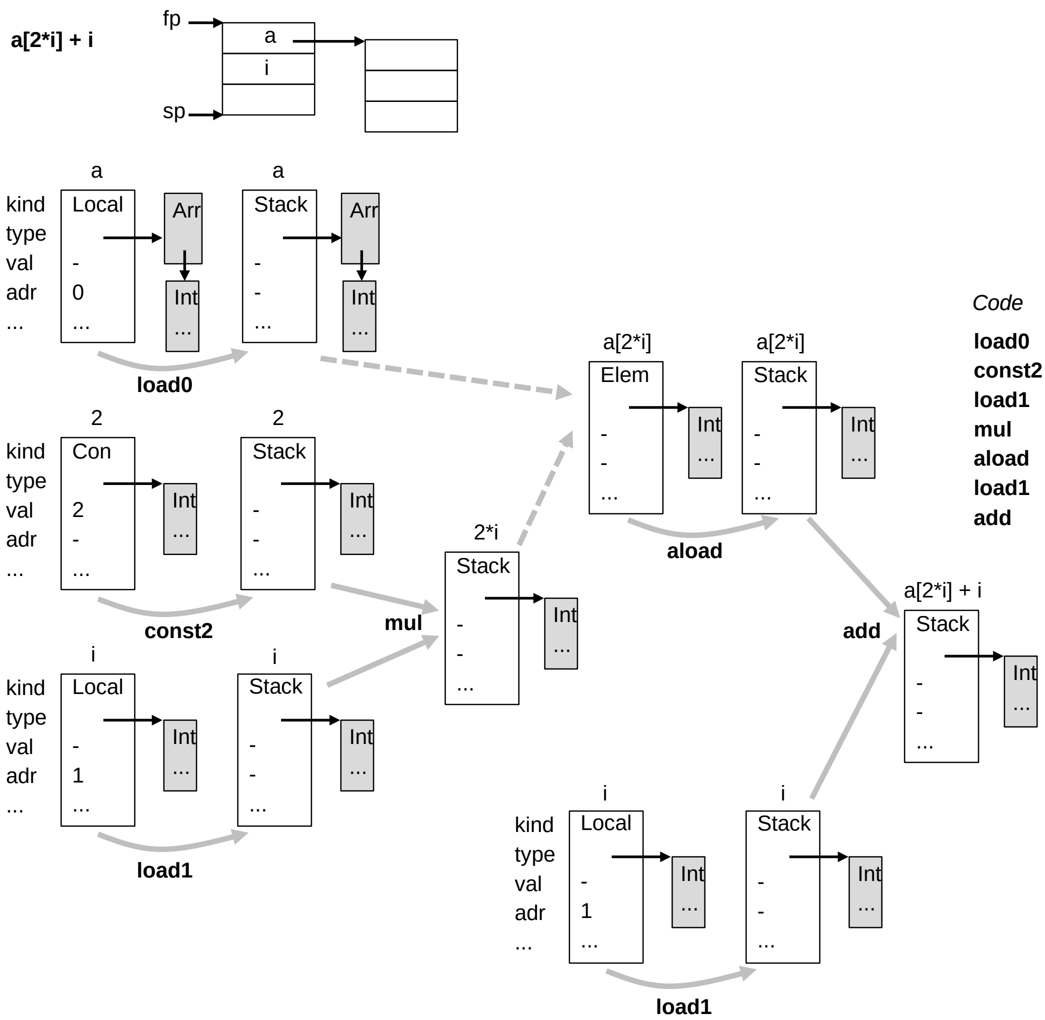
Exercise 2: Operands of Code Generation (2)

Similar to Fig. 6.25, show which operands are created when compiling the expression a[2 * i] + i and which code is generated in the process. a is a local variable at address 0 pointing to an int array, i is a local variable at address 1.

Solution



- The local variable a is described by a Local operand with address 0. It is loaded onto the EStack with **load0**.
- The constant 2 is described by a Con operand. It is loaded onto the EStack with **const2**.
- The local variable i is described by a Local operand with address 1. It is loaded onto the EStack with **load1**.
- Then 2 and i are multiplied by **mul**. The result (2 * i) is on the EStack and is therefore described by a Stack operand.
- An Elem operand is created from a and 2 * i and is loaded onto the EStack with **aload**.
- The local variable i is described by a Local operand with address 1. It is loaded onto the EStack with **load1**
- Finally, the two values on the EStack (a[2 * i] and i) are added by the instruction **add**. The result (a[2 * i] + i) is described by a Stack operand.