

Semantics (V)

Conditional Semantics (cont.)

- To extend our simple interpreter for the conditional statement, we need to add conditional class, the meaning function to statements including assignments, conditionals, and extendible to other statement types, the meaning function of conditional, and a main function to test them.

```
# Conditional has three attribute: condition,
# thenbranch, and elsebranch
class Conditional:
    def __init__(self, condition, thenbranch, elsebranch):
        self.condition = condition
        self.thenbranch = thenbranch
        self.elsebranch = elsebranch

# Meaning function of Statement
# M(Statement statement, State state)
def M_Statement(statement, state):
    if isinstance(statement, Assignment):
        return M_Assignment(statement, state)
    elif isinstance(statement, Conditional):
        return M_Conditional(statement, state)
    else:
        print("ERROR: wrong type of statement")

# Meaning function of Conditional
# M(Statement statement, State state)
def M_Conditional(statement, state):
    if M_Expression(statement.condition, state).value:
        state = M_Statement(statement.thenbranch, state)
    else:
        state = M_Statement(statement.elsebranch, state)
    return state

def main3():
    # if (a < b) {
    #   min = a;
    # }
    # else {
    #   min = b;
    # }
    # {<min, 0>, <a, 3>, <b, 5>}
    varmin = Variable('min')
    vara = Variable('a')
    varb = Variable('b')
    state = State()
    state.setValue(varmin, 0)
    state.setValue(vara, 3)
    state.setValue(varb, 5)
    expr = BinaryExpression(vara, '<', varb)
    thenbranch = Assignment(varmin, M_Expression(vara, state))
    elsebranch = Assignment(varmin, M_Expression(varb, state))
    cond = Conditional(expr, thenbranch, elsebranch)
    newState = M_Statement(cond, state)
    print(newState)
```

```
if __name__ == "__main__":  
    #main1()  
    #main2()  
    main3()
```