

COMP 430
Summer 2025

Class-Based Object-Oriented Inheritance
Non-Generic Syntax

i is an integer
x is a variable
cname is a class name
mname is a method name

```
exp ::= i | lhs
lhs ::= x | lhs.x | this
type ::= int | cname
vdec ::= type x
stmt ::= vdec = new cname(exp*) |
        vdec = exp.mname(exp*) |
        print(exp) |
        return exp |
        lhs = exp |
        super(exp*) |
        stmt; stmt |
        empty
mdef ::= [virtual] type mname(vdec*) { stmt }
cdef ::= class cname [extends cname] {
        vdec*
        init(vdec*) { stmt }
        mdef*
    }
program ::= cdef* stmt
```

Class-Based Object-Oriented Inheritance Generic Syntax

T is a type variable

i is an integer

x is a variable

cname is a class name

mname is a method name

exp ::= i | lhs

lhs ::= x | lhs.x | this

type ::= int | cname<type*> | T

vdec ::= type x

stmt ::= vdec = new cname<type*>(exp*) |
vdec = exp.mname<type*>(exp*) |
print(exp) |
return exp |
lhs = exp |
super(exp*) |
stmt; stmt |
empty

mdef ::= [virtual] <T*> type mname(vdec*) { stmt }

cdef ::= class cname<T*> [extends cname<T*>] {
vdec*
init(vdec*) { stmt }
mdef*
}

program ::= cdef* stmt