While20.pdf

Juanma21_

Teoría de Los Lenguajes de Programación

4º Grado en Ingeniería Informática

Escuela Técnica Superior de Ingeniería Informática
Universidad de Málaga

While20.hs

```haskell
-- ------------------------------------------------------------------
-- While20.hs
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module While20 where

type  Var   =  String

data  Aexp  =  N Integer
            |  V Var
            |  Add Aexp Aexp
            |  Mult Aexp Aexp
            |  Sub Aexp Aexp
            |  Div Aexp Aexp
            deriving (Show, Eq)

data  Bexp  =  TRUE
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1/6

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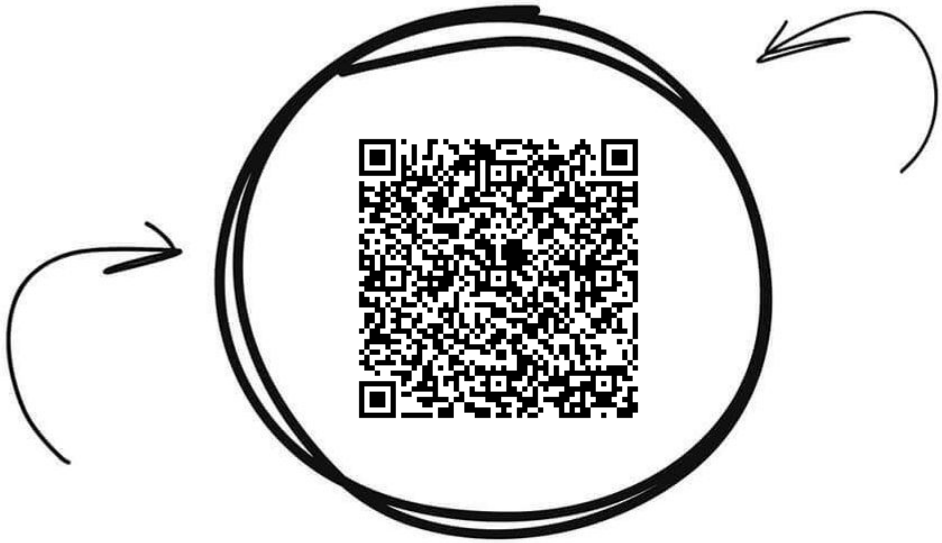

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data  Stm   =  Ass Var Aexp
            |  Skip
            |  Comp Stm Stm
            |  If Bexp Stm Stm
            |  Case Aexp LabelledStms
            |  Swap Var Var
            |  For Stm Bexp Stm Stm
            deriving Show

data LabelledStms = LabelledStm [Integer] Stm LabelledStms
                  | Default Stm
                  | EndLabelledStms
                  deriving Show

type  Z      =  Integer
type  T      =  Bool
type  State  =  Var -> Z

aVal :: Aexp -> State -> Z
aVal (N n) _        =  n
aVal (V x) s        =  s x
aVal (Add a1 a2) s  =  aVal a1 s + aVal a2 s
aVal (Sub a1 a2) s  =  aVal a1 s - aVal a2 s
aVal (Mult a1 a2) s =  aVal a1 s * aVal a2 s
aVal (Div a1 a2) s  =  aVal a1 s `div` aVal a2 s

bVal :: Bexp -> State -> T
```

```
52 bVal TRUE _         =  True
53 bVal FALSE _        =  False
54 bVal (Eq a1 a2) s   =  aVal a1 s == aVal a2 s
55 bVal (Le a1 a2) s   =  aVal a1 s <= aVal a2 s
56 bVal (Neg b) s      =  not(bVal b s)
57 bVal (And b1 b2) s =  bVal b1 s && bVal b2 s
58
```

While20.hs

```haskell
-- ------------------------------------------------------------------
-- While20.hs
-- ------------------------------------------------------------------

module While20 where

type  Var   =  String

data  Aexp  =  N Integer
            |  V Var
            |  Add Aexp Aexp
            |  Mult Aexp Aexp
            |  Sub Aexp Aexp
            |  Div Aexp Aexp
            deriving (Show, Eq)

data  Bexp  =  TRUE
            |  FALSE
            |  Eq Aexp Aexp
            |  Le Aexp Aexp
            |  Neg Bexp
            |  And Bexp Bexp
            deriving (Show, Eq)

data  Stm   =  Ass Var Aexp
            |  Skip
            |  Comp Stm Stm
            |  If Bexp Stm Stm
            |  Case Aexp LabelledStms
            |  Swap Var Var
            |  For Stm Bexp Stm Stm
            deriving Show

data LabelledStms = LabelledStm [Integer] Stm LabelledStms
                  | Default Stm
                  | EndLabelledStms
                  deriving Show

type  Z      =  Integer
type  T      =  Bool
type  State  =  Var -> Z

aVal :: Aexp -> State -> Z
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aVal (Sub a1 a2) s  =  aVal a1 s - aVal a2 s
aVal (Mult a1 a2) s =  aVal a1 s * aVal a2 s
aVal (Div a1 a2) s  =  aVal a1 s `div` aVal a2 s

bVal :: Bexp -> State -> T
```

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56 bVal (Neg b) s      =  not(bVal b s)
57 bVal (And b1 b2) s =  bVal b1 s && bVal b2 s
58
```

While20.hs

```haskell
-- ------------------------------------------------------------------
-- While20.hs
-- ------------------------------------------------------------------

module While20 where

type  Var   =  String

data  Aexp  =  N Integer
            |  V Var
            |  Add Aexp Aexp
            |  Mult Aexp Aexp
            |  Sub Aexp Aexp
            |  Div Aexp Aexp
            deriving (Show, Eq)

data  Bexp  =  TRUE
            |  FALSE
            |  Eq Aexp Aexp
            |  Le Aexp Aexp
            |  Neg Bexp
            |  And Bexp Bexp
            deriving (Show, Eq)

data  Stm   =  Ass Var Aexp
            |  Skip
            |  Comp Stm Stm
            |  If Bexp Stm Stm
            |  Case Aexp LabelledStms
            |  Swap Var Var
            |  For Stm Bexp Stm Stm
            deriving Show

data LabelledStms = LabelledStm [Integer] Stm LabelledStms
                  | Default Stm
                  | EndLabelledStms
                  deriving Show

type  Z      =  Integer
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aVal (Sub a1 a2) s  =  aVal a1 s - aVal a2 s
aVal (Mult a1 a2) s =  aVal a1 s * aVal a2 s
aVal (Div a1 a2) s  =  aVal a1 s `div` aVal a2 s

bVal :: Bexp -> State -> T
```

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56 bVal (Neg b) s      =  not(bVal b s)
57 bVal (And b1 b2) s =  bVal b1 s && bVal b2 s
58
```