$a ::$
$as \neq$
as
$_{o}p(S :$
$Type) :=$
$SS.Definitionbinary_{o}p(S :$
$Type) :=$
$SSS.$
$_{p}roductST : Type(eqS :$
$brelS)(eqT :$
$brelT) :$
$brel(S*$
$T) :=$
$xy, matchx, ywith|(s1, t1), (s2, t2) =>$
$andb(eqSs1s2)(eqTt1t2)end.$
$_{p}roductST : Type(bS :$
$binary_{o}pS)(bT :$
$binary_{o}pT) :$
$binary_{o}p(S*$
$T) :=$
$xy, matchx, ywith|(s1, t1), (s2, t2) =>$
$(bSs1s2, bTt1t2)end.$
$_{c}omplement :$
$S : Type, brelS- >$
$brelS :=$
$Srxy, if(rxy)thenfalseelsetrue.Definitionbrel_{c}onjunction :$
$S : Type, brelS- >$
$brelS- >$
$brelS :=$
$Sr1r2xy, (r1xy)(r2xy).Definitionbrel_{l}lte :$
$S : Type, brelSbinary_{o}pSbrelS :=$
$Seqbxy, eqx(bxy).Definitionbrel_{l}lt :$
$S : Type, brelSbinary_{o}pSbrelS :=$
$Seqb, brel_{c}onjunction(brel_{l}lteeqb)(brel_{c}omplementeq).Definitionbop_{l}lex :$
$ST : Type, brelSbinary_{o}pSbinary_{o}pTbinary_{o}p(S*$
$T) :=$
$STeqb1b2xy, matchx, ywith|(a, b), (c, d) =>$
$(b1ac, ifeqacthen(b2bd)elseifbrel_{l}lteqb1acthenbelsed)end.$
$_{c}onstant :$
$Type :=$
$string.Definitionbrel_{a}dd_{c}onstant :$
$S : Type, brelScas_{c}onstantbrel(cas_{c}onstant+$
$S) :=$
$SrScxy, matchx, ywith|(inl_{)}, (inl_{)} =>$
$true(*allconstantsequal!*)|(inl_{)}, (inr_{)} =>$
$false|(inr_{)}, (inl_{)} =>$
$false|(inra), (inrb) =>$
$rSabend.$
$_{a}dd_{a}nn :$
$S : Type, binary_{o}pScas_{c}onstantbinary_{o}p(cas_{c}onstant+$
$S) :=$
$SbScxy, matchx, ywith|(inl_{)},_{=} >$
$inlc|_{,}(inl_{)} =>$
$inlc|(inra), (inrb) =>$
$inr_{(}bSab)end.$
$_{a}dd_{i}d :$
$S : Type, binary_{o}pScas_{c}onstantbinary_{o}p(cas_{c}onstant+$
$S) :=$
$SbScxy, matchx, ywith|(inl_{)}, (inl_{)} =>$
$inlc|(inl_{)}, (inr_{)} =>$
$y|(inr_{)}, (inl_{)} =>$
$x|(inra), (inrb) =>$
$inr_{(}bSab)end.$
$_{r}eflexive(S :$
$Type)(r :$
$brelS) :=$
$s :$
$S, rss =$
$true.Definitionbrel_{s}ymmetric(S :$
$Type)(r :$
$brelS) :=$
$st :$
$S, (rst =$
$true)(rts =$
$true).Definitionbrel_{t}ransitive(S :$
$Type)(r :$
$brelS) :=$
$stu :$
$S, (rst =$
$true)(rtu =$
$true)(rsu =$