

```

(*****
(* ProgrammingLanguageArrow *)
(* *)
(* Arrows in ProgrammingLanguages. *)
(* *)
(*****

```

Generalizable All Variables.

```

Require Import Preamble.
Require Import General.
Require Import Categories_ch1_3.
Require Import InitialTerminal_ch2_2.
Require Import Functors_ch1_4.
Require Import Isomorphisms_ch1_5.
Require Import ProductCategories_ch1_6_1.
Require Import OppositeCategories_ch1_6_2.
Require Import Enrichment_ch2_8.
Require Import Subcategories_ch7_1.
Require Import NaturalTransformations_ch7_4.
Require Import NaturalIsomorphisms_ch7_5.
Require Import BinoidalCategories.
Require Import PreMonoidalCategories.
Require Import PreMonoidalCenter.
Require Import MonoidalCategories_ch7_8.
Require Import Coherence_ch7_8.
Require Import Enrichment_ch2_8.
Require Import RepresentableStructure_ch7_2.
Require Import FunctorCategories_ch7_7.

```

```

Require Import NaturalDeduction.
Require Import NaturalDeductionCategory.

```

```

Require Import ProgrammingLanguage.
Require Import FreydCategories.
Require Import Enrichments.
Require Import GeneralizedArrow.

```

Section ArrowInLanguage.

```

(* an Arrow In A Programming Language consists of... *)

```

```

(* a host language: *)
Context '(Host          : ProgrammingLanguage).

Context (Host_Monoidal : MonoidalCat (TypesL_PreMonoidal Host)).
Context (Host_Cartesian : CartesianCat Host_Monoidal).

Context
  {P}
  (Pobj_unit   : P [])
  (Pobj_closed : forall a b, P a → P b → P (bin_obj(BinoidalCat:=Center_is_PreMonoidal (TypesL_PreMonoidal Host)) a b)).

Context (VK : FullSubcategory Host_Cartesian P).

Context ehom KE (K_bin:@EBinoidalCat _ _ VK _ _ _
  (PreMonoidalFullSubcategory_PreMonoidal Host_Cartesian VK Pobj_unit Pobj_closed)
  (TypesL Host) ehom KE (bin_obj(BinoidalCat:=Host_Monoidal))).

Context (K_premonoidal:PreMonoidalCat K_bin (one(TerminalObject:=Host_Cartesian))).

Definition ArrowInProgrammingLanguage :=
  @FreydCategory _ _ _ _ _ _ Host_Cartesian _ _ K_bin K_premonoidal.

Definition K_enrichment : Enrichment.
  refine
    {| enr_c_pm := K_premonoidal
     ; enr_v_mon := MonoidalFullSubcategory_Monoidal Host_Cartesian _ _ VK
     |}.
  Defined.

Instance ArrowsAreGeneralizedArrows : GeneralizedArrow K_enrichment (TypesEnrichedInJudgments Host) :=
  { ga_functor_monoidal :=
    PreMonoidalFullSubcategoryInclusionFunctor_PreMonoidal Host_Cartesian VK Pobj_unit Pobj_closed Host_Cartesian }.

End ArrowInLanguage.

```