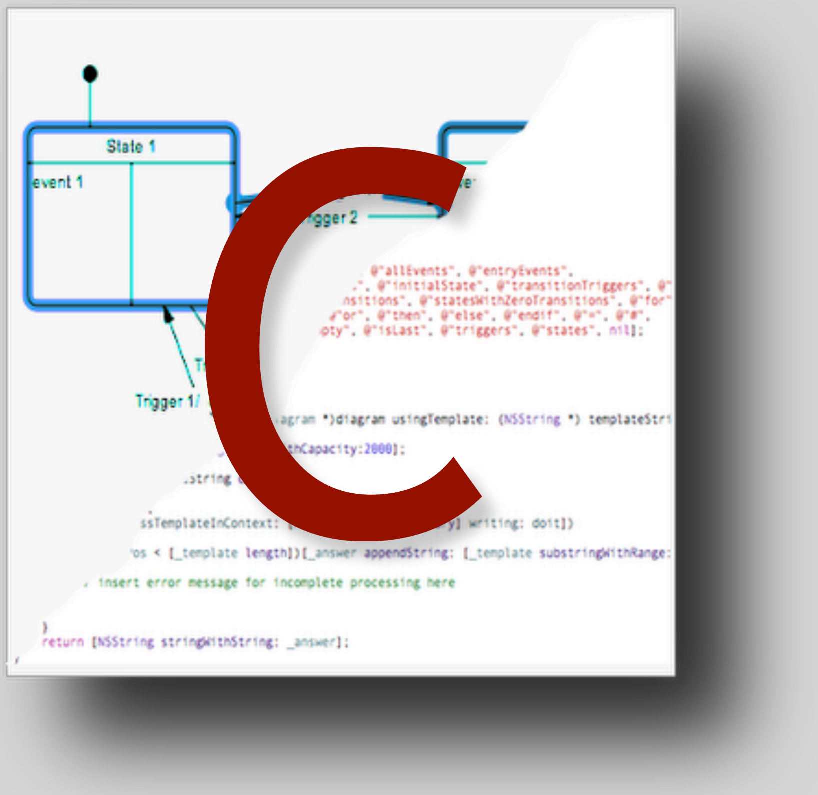
A Template for C-Code Generation using Switch Statements



Code Templates for the State Diagram Editor

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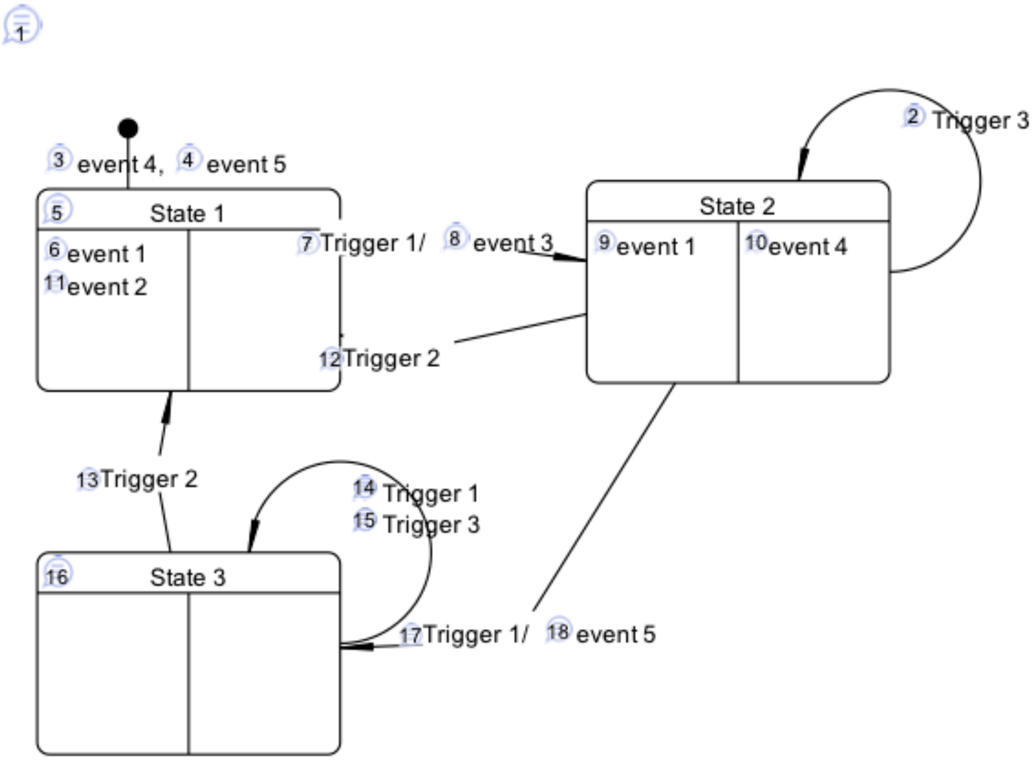
A Template for C-Code generation using Switch Statements

The template C-switch.codetemplate is used to generate linear C-code using for each trigger a distinct function. Each of those functions consists of a switch statement with cases for each state, in which the trigger either causes at least one event to be trigggered or a transition to another state (or both).
There is no special treatment for zero transitions.
For diagrams triggering a lot of events this representation supports easy debugging, it may be advisable, to have the original diagram as reference during debugging since the code does not reflect the states table as clearly as the table based C-code.



Comments:
1 Standard example diagram to demonstrate code generation
2 Trigger 3 results in a zero transition in state 2
3 event 4 triggered when initializing the state machine
4 event 5 triggered when initializing the state machine
5 This is the initial state
6 event 1 triggered when entering state 1
7 Trigger 1 results in the transition from state 1 to state 2
8 event 3 is triggered, when the transition from state 1 to state 2 takes place
9 event 1 triggered when entering state 2
10 event 4 triggered when leaving state 2
11 event 2 triggered when entering state 1
12 Trigger 2 results in the transition from state 2 to state 1
13 Trigger 2 results in the transition from state 3 to state 1
14 Trigger 1 results in a zero transition in state 3
15 Trigger 3 results in a zero transition in state 3
16 This is state 3
17 Trigger 1 results in the transition from state 2 to state 3
18 event 5 is triggered, when the transition from state 2 to state 3 takes place

The example diagram

C-Header generated from the Example Diagram:

```
// Code generated by StateDiagramEditor (c) Copyright 2010 Stefan Sachs www.ssachs.de
// Full version, temporarily licensed to Daisy Duck
// commercial use of this generated code is illegal
// (c) Copyright for template 2009  Stefan Sachs
// generated from diagram demo at 2010-10-19 21:18:05 +0200
// Standard example diagram to demonstrate code generation
#ifndef _demo_H
#define _demo_H

void demo_init(void);

void  Trigger1(void);
void  Trigger2(void);
void  Trigger3(void);

typedef enum {
       demo_State1,  // This is the initial state
       demo_State2,
       demo_State3  // This is state 3
       } demo_state_id;
#endif
```

C-Code generated from the Example Diagram:

```
// Code generated by StateDiagramEditor (c) Copyright 2010 Stefan Sachs www.ssachs.de
// Full version, temporarily licensed to Daisy Duck
// commercial use of this generated code is illegal
// C Code using switch statements
// (c) Copyright for template 2009  Stefan Sachs
// generated from diagram demo at 2010-10-19 21:18:05 +0200
// Standard example diagram to demonstrate code generation
#include <demo.h>

static demo_state_id actualState;

void demo_init(void)
{
   actualState = demo_State1;
   event4();
// event 4 triggered when initializing
// the state machine
   event5();
// event 5 triggered when initializing
// the state machine
   event1();
// event 1 triggered when entering
// state 1
   event2();
// event 2 triggered when entering
// state 1
}

void Trigger1(void)
{
    switch(actualState)
    {
      case demo_State1:
// Trigger 1 results in the transition from state 1 to state 2
          actualState = demo_State2;
// event 3 is triggered, when the
// transition from state 1 to state 2
// takes place
          event3();
// event 1 triggered when entering
// state 2
          event1();
          break;
      case demo_State2:
```

```
// event 4 triggered when leaving state
// state 2
          event4();
// Trigger 1 results in the transition from state 2 to state 3
          actualState = demo_State3;
// event 5 is triggered, when the
// transition from state 2 to state 3
// takes place
          event5();
          break;
     default:
          break;
    }
}

void Trigger2(void)
{
    switch(actualState)
    {
      case demo_State2:
// event 4 triggered when leaving state
// state 2
          event4();
// Trigger 2 results in the transition from state 2 to state 1
          actualState = demo_State1;
// event 1 triggered when entering
// state 1
          event1();
// event 2 triggered when entering
// state 1
          event2();
          break;
      case demo_State3:
// Trigger 2 results in the transition from state 3 to state 1
          actualState = demo_State1;
// event 1 triggered when entering
// state 1
          event1();
// event 2 triggered when entering
// state 1
          event2();
          break;
     default:
          break;
    }
}

void Trigger3(void)
{
    switch(actualState)
    {
     default:
          break;
    }
}
```