2 layer GRU:

```
_________________________________________________________________
 Layer (type)                 Output Shape              Param #
=================================================================
 bidirectional_1 (Bidirectio  (None, 10, 256)          145920
 nal)

 dropout (Dropout)            (None, 10, 256)           0

 average_pooling1d (AverageP  (None, 5, 256)           0
 ooling1D)

 bidirectional_2 (Bidirectio  (None, 5, 256)           296448
 nal)

 dropout_1 (Dropout)          (None, 5, 256)            0

 average_pooling1d_1 (Averag  (None, 2, 256)           0
 ePooling1D)

 dense (Dense)                (None, 2, 1)              257

=================================================================
Total params: 442,625
Trainable params: 442,625
Non-trainable params: 0
```

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Results for "gru", 16 inferences @216MHz/216MHz (complexity: 2930198 MACC)
 duration      : 88.912 ms (average)
 CPU cycles    : 19205119 (average)
 CPU Workload : 8% (duty cycle = 1s)
 cycles/MACC   : 6.55 (average for all layers)
 used stack    : 744 bytes
 used heap     : 0:0 0:0 (req:allocated,req:released) max=0 cur=0 (cfg=3)
 observer res : 184 bytes used from the heap (10 c-nodes)

 Inference time by c-node
  kernel   : 88.899ms (time passed in the c-kernel fcts)
  user     : 0.006ms (time passed in the user cb)

 c_id  type                id       time (ms)
 -------------------------------------------------
 0     GRU                 0         22.894  25.75 %
 1     GRU                 0         22.886  25.74 %
 2     CONCAT              0          0.026   0.03 %
 3     POOL                2          0.081   0.09 %
 4     GRU                 3         21.475  24.16 %
 5     GRU                 3         21.468  24.15 %
 6     CONCAT              3          0.014   0.02 %
 7     POOL                5          0.033   0.04 %
 8     DENSE               6          0.015   0.02 %
 9     NL                  6          0.002   0.00 %
 -------------------------------------------------
                                     88.899 ms
```

c-layers (10)

c_id	name (*_layer)	id	layer_type	macc	rom	tensors	shape (array id)
0	backward_gru_1	0	gru	724480	291840	I: input_0_output	(1,10,60) (13)
						S: backward_gru_1_scratch0	
						W: backward_gru_1_kernel	(60,384) (24)
						W: backward_gru_1_recurrent	(128,384) (25)
						W: backward_gru_1_bias	(384,2) (26)
						O: backward_gru_1_output0	(1,10,128) (14)
1	forward_gru_1	0	gru	724480	291840	I: input_0_output	(1,10,60) (13)
						S: forward_gru_1_scratch0	
						W: forward_gru_1_kernel	(60,384) (27)
						W: forward_gru_1_recurrent	(128,384) (28)
						W: forward_gru_1_bias	(384,2) (0)
						O: forward_gru_1_output0	(1,10,128) (15)
2	bidirectional_1	0	concat	0	0	I: forward_gru_1_output0	(1,10,128) (15)
						I: backward_gru_1_output0	(1,10,128) (14)
						O: bidirectional_1_output	(1,10,256) (16)
3	average_pooling1d	2	pool	2560	0	I: bidirectional_1_output	(1,10,256) (16)
						O: average_pooling1d_output	(1,5,256) (17)
4	backward_gru_2	3	gru	738560	592896	I: average_pooling1d_output	(1,5,256) (17)
						S: backward_gru_2_scratch0	
						W: backward_gru_2_kernel	(256,384) (1)
						W: backward_gru_2_recurrent	(128,384) (2)
						W: backward_gru_2_bias	(384,2) (3)
						O: backward_gru_2_output0	(1,5,128) (18)
5	forward_gru_2	3	gru	738560	592896	I: average_pooling1d_output	(1,5,256) (17)
						S: forward_gru_2_scratch0	
						W: forward_gru_2_kernel	(256,384) (4)
						W: forward_gru_2_recurrent	(128,384) (5)
						W: forward_gru_2_bias	(384,2) (6)
						O: forward_gru_2_output0	(1,5,128) (19)
6	bidirectional_2	3	concat	0	0	I: forward_gru_2_output0	(1,5,128) (19)
						I: backward_gru_2_output0	(1,5,128) (18)
						O: bidirectional_2_output	(1,5,256) (20)
7	average_pooling1d_1	5	pool	1024	0	I: bidirectional_2_output	(1,5,256) (20)
						O: average_pooling1d_1_output	(1,2,256) (21)
8	dense_dense	6	dense	514	1028	I: average_pooling1d_1_output	(1,2,256) (21)
						W: dense_dense_weights	(256,1) (7)
						W: dense_dense_bias	(1,) (8)
						O: dense_dense_output	(1,2,1) (22)
9	dense	6	nl	20	0	I: dense_dense_output	(1,2,1) (22)
						O: dense_output	(1,2,1) (23)

Number of operations per c-layer

c_id	m_id	name (type)	#op	type	#param	sparsity
0	0	backward_gru_1 (gru)	724,480	smul_f32_f32	72,960	0.0000
1	0	forward_gru_1 (gru)	724,480	smul_f32_f32	72,960	0.0000
2	0	bidirectional_1 (concat)	0	op_f32_f32		
3	2	average_pooling1d (pool)	2,560	op_f32_f32		
4	3	backward_gru_2 (gru)	738,560	smul_f32_f32	148,224	0.0000
5	3	forward_gru_2 (gru)	738,560	smul_f32_f32	148,224	0.0000
6	3	bidirectional_2 (concat)	0	op_f32_f32		
7	5	average_pooling1d_1 (pool)	1,024	op_f32_f32		
8	6	dense_dense (dense)	514	smul_f32_f32	257	0.0000
9	6	dense (nl)	20	op_f32_f32		
total			2,930,198		442,625	0.0000

CNN (sincnet+ 2 conv1d)

Layer (type)	Output Shape	Param #
input_1 (InputLayer)	[(None, 3200, 1)]	0
sinc_conv_fast_1 (SincConvFast)	(None, 40, 80)	360
layer_norm (LayerNorm)	(None, 40, 80)	160
leaky_re_lu (LeakyReLU)	(None, 40, 80)	0
max_pooling1d (MaxPooling1D)	(None, 20, 80)	0
conv1d (Conv1D)	(None, 16, 60)	24060
leaky_re_lu_1 (LeakyReLU)	(None, 16, 60)	0
max_pooling1d_1 (MaxPooling1D)	(None, 8, 60)	0
conv1d_1 (Conv1D)	(None, 4, 60)	18060
leaky_re_lu_2 (LeakyReLU)	(None, 4, 60)	0
max_pooling1d_2 (MaxPooling1D)	(None, 2, 60)	0
dense (Dense)	(None, 2, 50)	3050

Total params: 45,690
Trainable params: 45,690
Non-trainable params: 0

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```
Results for "cnn", 16 inferences @216MHz/216MHz (complexity: 1800405 MACC)
 duration      : 95.917 ms (average)
 CPU cycles    : 20718263 (average)
 CPU Workload : 9% (duty cycle = 1s)
 cycles/MACC   : 11.50 (average for all layers)
 used stack    : 656 bytes
 used heap     : 0:0 0:0 (req:allocated,req:released) max=0 cur=0 (cfg=3)
 observer res : 376 bytes used from the heap (22 c-nodes)

 Inference time by c-node
  kernel   : 95.886ms (time passed in the c-kernel fcts)
  user     : 0.021ms (time passed in the user cb)

 c_id  type                id       time (ms)
 -------------------------------------------------
 0     CONV2D              1          66.101  68.94 %
 1     REDUCE              3           0.399   0.42 %
 2     ELTWISE             3           0.052   0.06 %
 3     ELTWISE             9           0.996   1.04 %
 4     ELTWISE             4           1.051   1.10 %
 5     REDUCE              5           0.399   0.42 %
 6     ELTWISE             5           0.052   0.06 %
 7     NL                  6           0.006   0.01 %
 8     ELTWISE             7           0.053   0.06 %
 9     ELTWISE             8           0.057   0.06 %
 10    ELTWISE             10          1.003   1.05 %
 11    BN                  11          0.550   0.57 %
 12    NL                  12          0.205   0.21 %
 13    POOL                14          0.111   0.12 %
 14    CONV2D              17         20.349  21.22 %
 15    NL                  19          0.067   0.07 %
 16    POOL                21          0.037   0.04 %
 17    CONV2D              24          3.947   4.12 %
 18    NL                  26          0.018   0.02 %
 19    POOL                28          0.010   0.01 %
 20    DENSE               40          0.323   0.34 %
 21    NL                  41          0.089   0.09 %
 -------------------------------------------------
                                     95.886 ms
```

Number of operations per c-layer

c_id	m_id	name (type)	#op	type	#param	sparsity
0	1	conv2d_1 (conv2d)	1,283,280	smul_f32_f32	32,160	0.0025
1	3	reduce_3 (reduce)	3,200	smul_f32_f32		
2	3	reduce_3_Mul (eltwise/mul)	40	op_f32_f32	1	0.0000
3	9	eltwise_9 (eltwise/sub)	3,200	op_f32_f32		
4	4	eltwise_4 (eltwise/squared_diff)	16,000	op_f32_f32		
5	5	reduce_5 (reduce)	3,200	smul_f32_f32		
6	5	reduce_5_Mul (eltwise/mul)	40	op_f32_f32	1	0.0000
7	6	nl_6 (nl)	480	op_f32_f32		
8	7	eltwise_7 (eltwise/sum)	40	op_f32_f32	1	0.0000
9	8	eltwise_8 (eltwise/div)	5	op_f32_f32	1	0.0000
10	10	eltwise_10 (eltwise/mul)	3,200	op_f32_f32		
11	11	eltwise_11 (bn)	6,400	smul_f32_f32	160	0.5000
12	12	nl_12 (nl)	9,600	op_f32_f32		
13	14	pool_14 (pool)	3,200	op_f32_f32		
14	17	conv2d_17 (conv2d)	384,060	smul_f32_f32	24,060	0.0025
15	19	nl_19 (nl)	2,880	op_f32_f32		
16	21	pool_21 (pool)	960	op_f32_f32		
17	24	conv2d_24 (conv2d)	72,060	smul_f32_f32	18,060	0.0033
18	26	nl_26 (nl)	720	op_f32_f32		
19	28	pool_28 (pool)	240	op_f32_f32		
20	40	gemm_38 (dense)	6,100	smul_f32_f32	3,050	0.0164
21	41	nl_41 (nl)	1,500	op_f32_f32		
total			1,800,405		77,494	0.0043