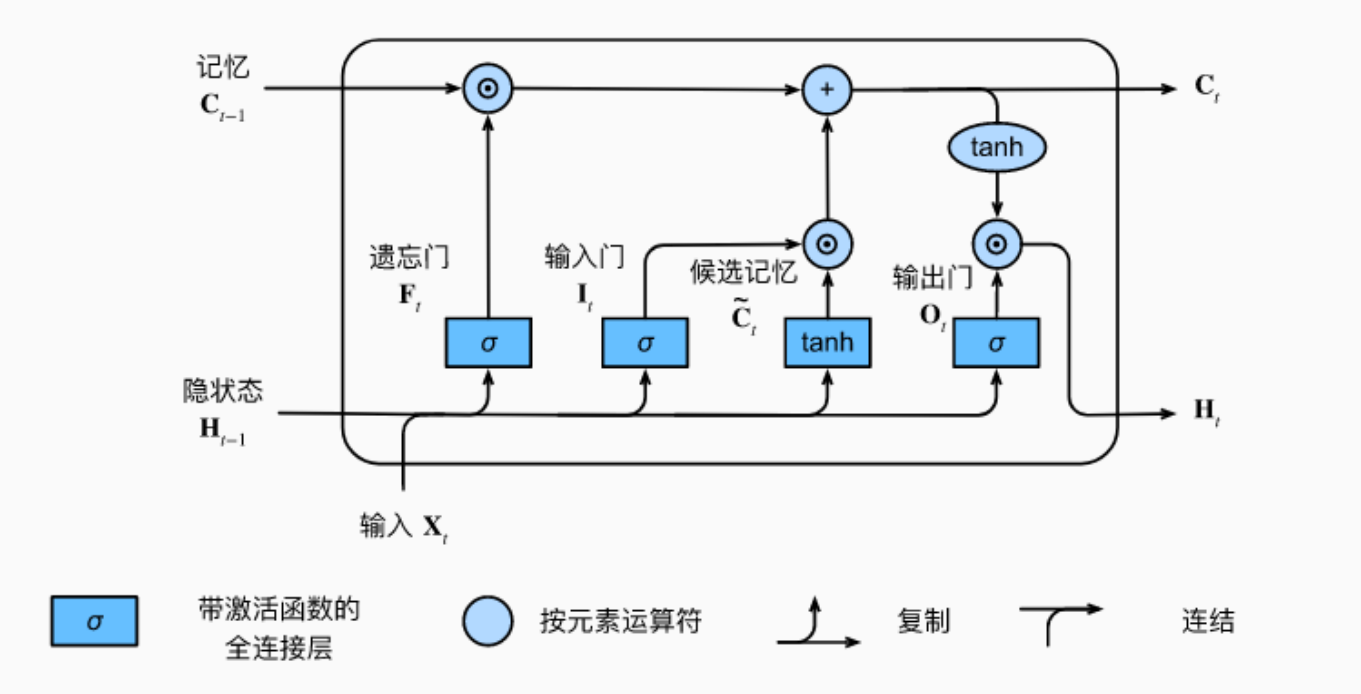
$$I_t = \sigma(X_t W_{xi} + H_{t-1} W_{hi} + b_i)$$
$$F_t = \sigma(X_t W_{xf} + H_{t-1} W_{hf} + b_f)$$
$$O_t = \sigma(X_t W_{xo} + H_{t-1} W_{ho} + b_o)$$
$$\tilde{C}_t = \tanh(X_t W_{xc} + H_{t-1} W_{hc} + b_c)$$
$$C_t = F_t \odot C_{t-1} + I_t \odot \tilde{C}_t$$
$$H_t = O_t \odot \tanh(C_t)$$



也是相关计算，初始化隐藏hidden时是元组形式包括两个(H和C)
H是-1到1之间的数字
C没有限制（就可以存储更多的东西）

PYTHON

```python
# d2l 中初始化隐藏层部分
def begin_state(self, device, batch_size=1):
        if not isinstance(self.rnn, nn.LSTM):
            # nn.GRU以张量作为隐状态
            return  torch.zeros((self.num_directions * self.rnn.num_la
                                 batch_size, self.num_hiddens),
                                device=device)
        else:
            # nn.LSTM以元组作为隐状态
            return (torch.zeros((
                self.num_directions * self.rnn.num_layers,
                batch_size, self.num_hiddens), device=device),
                    torch.zeros((
                        self.num_directions * self.rnn.num_layers,
                        batch_size, self.num_hiddens), device=device))
```