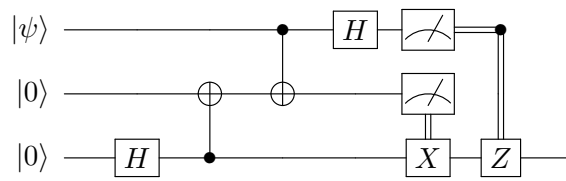


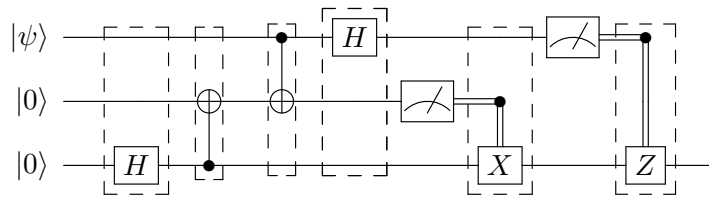
Quantum Programming Methodology

January 26, 2016

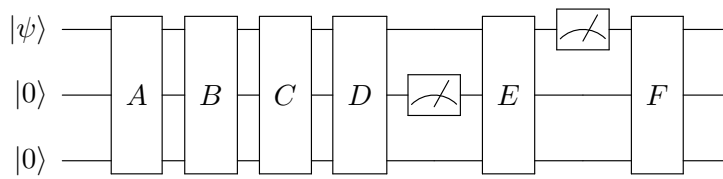
Circuit



Structure Into Vertical Slices



Generate the n -qubit Gate for Each Box



3-qubit gates

```
A=tensor(helper.I,helper.I,helper.H);  
B=tensor(helper.I,helper.BCNOT);  
C=tensor(helper.ACNOT,helper.I);  
D=tensor(helper.H,helper.I,helper.I);  
E=tensor(helper.I,helper.I,helper.X);  
F=tensor(helper.I,helper.I,helper.Z);  
% 3 by 3 I matrix, for conditional gates  
I3by3=tensor(helper.I,helper.I,helper.I);
```

Input

```
psi=u_propagate(state('0'),helper.H);  
in=tensor(psi,state('00'))
```

Application of first four gates

```
r0=u_propagate(in,D*C*B*A);
```

2nd row measurement

```
[~,b,r1]=measure(r0,2);cbit2=b-1;  
% application of E gate  
r2=u_propagate(r1,cbit2*E+double(~cbit2)*I3by3);
```

1st row measurement

```
[~,b,r3]=measure(r2,1);cbit1=b-1;  
% application of E gate  
r4=u_propagate(r3,cbit1*F+double(~cbit1)*I3by3)
```