

--- General structure ---

pseudo_code:

Factors (x11) = 1 poses + 2 motions + 8 lmks

States (x7) = 3 poses + 4 lmks

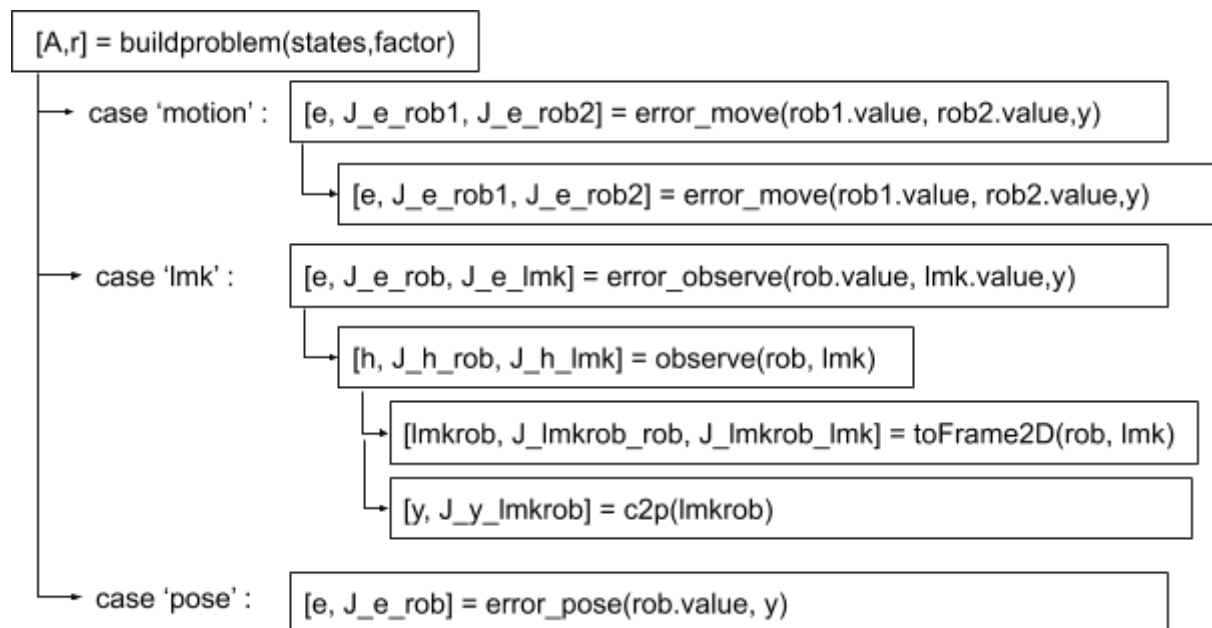
While

```
[A,r] = buildproblem(states, factor);  
dx= solvelinearized(A,r);
```

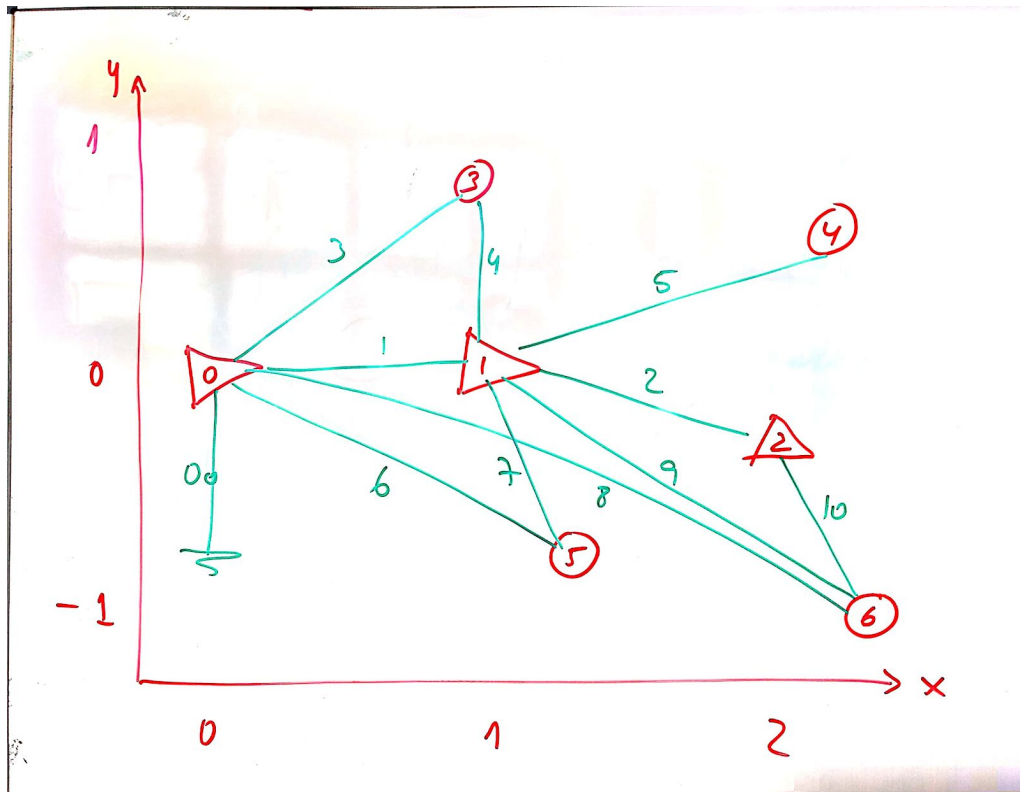
```
states = updatesstates(states,dx);
```

```
drawmap(states, fator);]
```

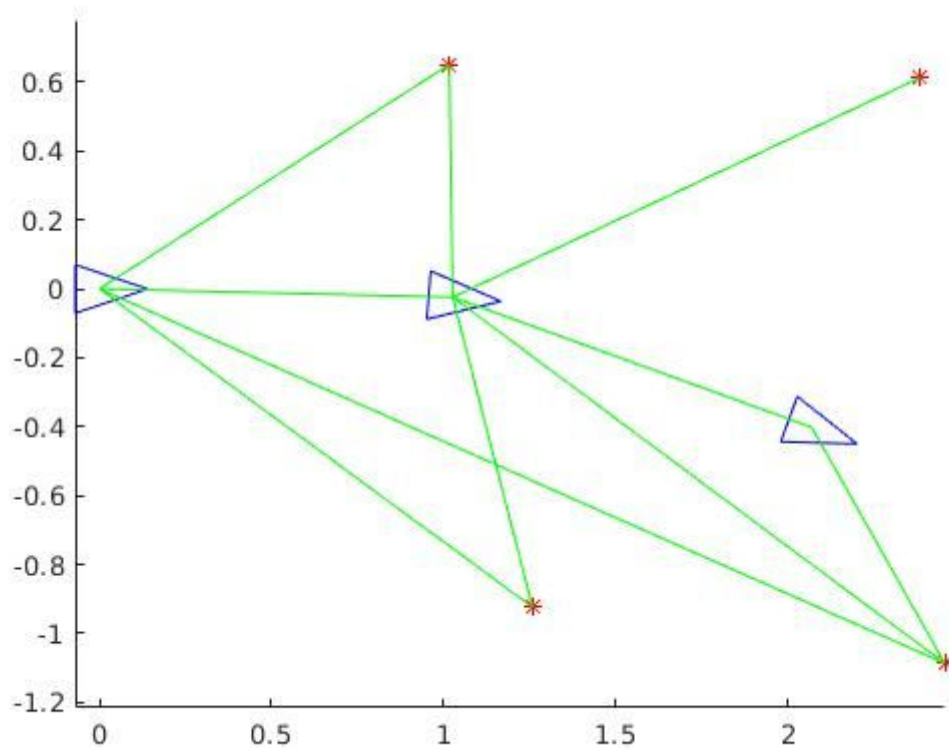
--- Structure of the function ---



--- Image of the advertised ---



--- Image of the first result ---



--- Before ---

% --- Factors ---

```

factor{1+ 0} = struct(...
    'type' , 'pose',...
    'measurement', [0;0;0],...
    'covariance', 1e-3*eye(3,3),...
    'index', 0);

factor{1+ 1} = struct(...
    'type' , 'motion',...
    'measurement', [1.0; 0.0; -5*torad],...
    'covariance', diag([1e-2, 1e-2, (2*torad)^2]),...
    'index', [0,1]);

factor{1+ 2} = struct(...
    'type' , 'motion',...
    'measurement', [1.05; -0.25; -15*torad],...
    'covariance', diag([1e-2, 1e-2, (5*torad)^2]),...
    'index', [1,2]);

factor{1+ 3} = struct(...
    'type' , 'lmk',...
    'measurement', [1.2; 40*torad],...
    'covariance', diag([1e-2, (10*torad)^2]),...
    'index', [0,3]);

factor{1+ 4} = struct(...
    'type' , 'lmk',...
    'measurement', [0.65; 95*torad],...
    'covariance', diag([1e-2,(5*torad)^2]),...
    'index', [1,3]);

factor{1+ 5} = struct(...
    'type' , 'lmk',...
    'measurement', [1.5; 30*torad],...
    'covariance', diag([1e-2,(10*torad)^2]),...
    'index', [1,4]);

factor{1+ 6} = struct(...
    'type' , 'lmk',...
    'measurement', [1.6; -35*torad],...
    'covariance', diag([1e-2,(15*torad)^2]),...
    'index', [0,5]);

factor{1+ 7} = struct(...
    'type' , 'lmk',...
    'measurement', [0.9; -75*torad],...
    'covariance', diag([1e-2,(10*torad)^2]),...

```

```
'index', [1,5]);
```

```
factor{1+ 8} = struct(...  
    'type' , 'Imk',...  
    'measurement', [2.8; -28*torad],...  
    'covariance', diag([4e-2,(7*torad)^2]),...  
    'index', [0,6]);
```

```
factor{1+ 9} = struct(...  
    'type' , 'Imk',...  
    'measurement', [1.8; -35*torad],...  
    'covariance', diag([3e-2,(10*torad)^2]),...  
    'index', [1,6]);
```

```
factor{1+ 10} = struct(...  
    'type' , 'Imk',...  
    'measurement', [0.7; -40*torad],...  
    'covariance', diag([2e-2,(10*torad)^2]),...  
    'index', [2,6]);
```

--- After ---

% --- Factors ---

```

factor{1+ 0} = struct(...
    'type' , 'pose',...
    'measurement', [0;0;0],...
    'covariance', 1e-3*eye(3,3),...
    'index', 0);

factor{1+ 1} = struct(...
    'type' , 'motion',...
    'measurement', [1.0; 0.0; -5*torad],...
    'covariance', diag([1e-2, 1e-2, (2*torad)^2]),...
    'index', [0,1]);

factor{1+ 2} = struct(...
    'type' , 'motion',...
    'measurement', [1.05; -0.25; -15*torad],...
    'covariance', diag([1e-2, 1e-2, (5*torad)^2]),...
    'index', [1,2]);

factor{1+ 3} = struct(...
    'type' , 'lmk',...
    'measurement', [1.3; 40*torad],...
    'covariance', diag([1e-2, (10*torad)^2]),...
    'index', [0,3]);

factor{1+ 4} = struct(...
    'type' , 'lmk',...
    'measurement', [0.72; 95*torad],...
    'covariance', diag([1e-2,(5*torad)^2]),...
    'index', [1,3]);

factor{1+ 5} = struct(...
    'type' , 'lmk',...
    'measurement', [1.15; 25*torad],...
    'covariance', diag([1e-2,(10*torad)^2]),...
    'index', [1,4]);

factor{1+ 6} = struct(...
    'type' , 'lmk',...
    'measurement', [1.5; -40*torad],...
    'covariance', diag([1e-2,(15*torad)^2]),...
    'index', [0,5]);

factor{1+ 7} = struct(...
    'type' , 'lmk',...
    'measurement', [0.7; -78*torad],...
    'covariance', diag([1e-2,(10*torad)^2]),...

```

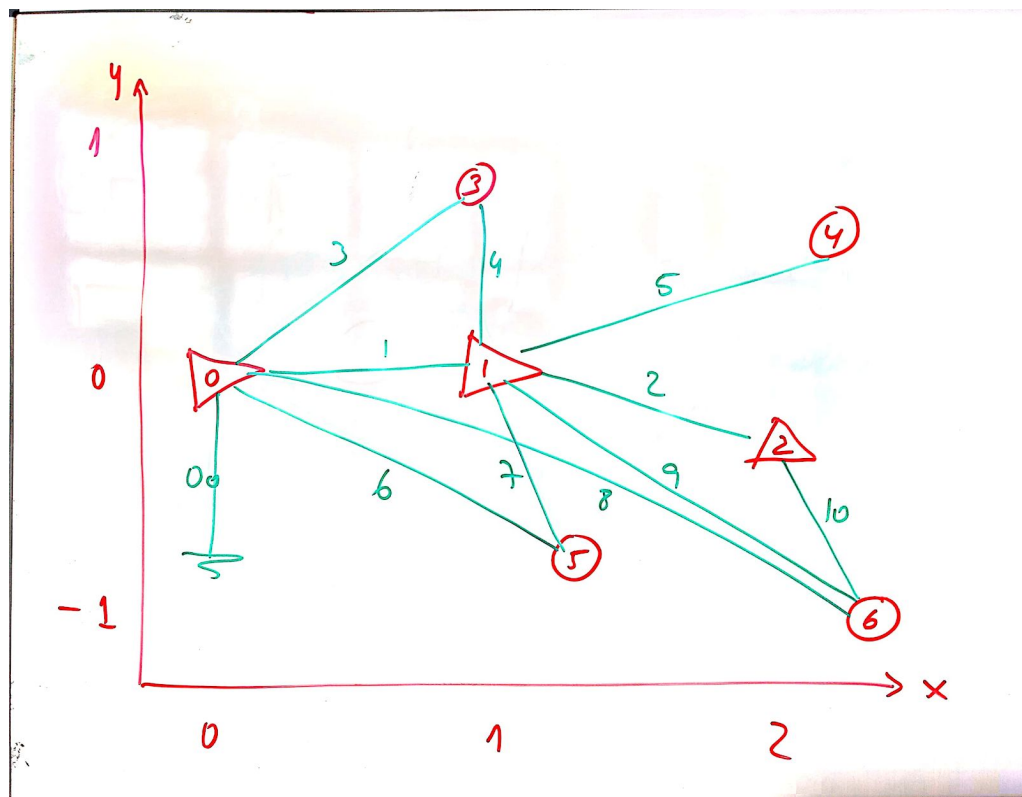
```
'index', [1,5]);
```

```
factor{1+ 8} = struct(...  
    'type' , 'lmk',...  
    'measurement', [2.4; -26*torad],...  
    'covariance', diag([2e-2,(7*torad)^2]),...  
    'index', [0,6]);
```

```
factor{1+ 9} = struct(...  
    'type' , 'lmk',...  
    'measurement', [1.5; -35*torad],...  
    'covariance', diag([3e-2,(10*torad)^2]),...  
    'index', [1,6]);
```

```
factor{1+ 10} = struct(...  
    'type' , 'lmk',...  
    'measurement', [0.9; -37*torad],...  
    'covariance', diag([2e-2,(10*torad)^2]),...  
    'index', [2,6]);
```

--- Image of the advertised ---



--- Image of the final result ---

