

## ex.2

完成 `Problem::TestMarginalize()` 中的代码，并通过测试:

```
// TODO:: home work. 将变量移动到右下角
// 准备工作：move the marg pose to the Hmm bottown right
// 将 row i 移动矩阵最下面
Eigen::MatrixXd temp_rows = H_marg.block(idx, 0, dim, reserve_size);
Eigen::MatrixXd temp_botRows = H_marg.block(idx + dim, 0, reserve_size - idx - dim, reserve_size);
H_marg.block(idx, 0, reserve_size - idx - dim, reserve_size) = temp_botRows;
H_marg.block(reserve_size - dim, 0, dim, reserve_size) = temp_rows;

// 将 col i 移动矩阵最右边
Eigen::MatrixXd temp_cols = H_marg.block(0, idx, reserve_size, dim);
Eigen::MatrixXd temp_rightCols = H_marg.block(0, idx + dim, reserve_size, reserve_size - idx - dim);
H_marg.block(0, idx, reserve_size, reserve_size - idx - dim) = temp_rightCols;
H_marg.block(0, reserve_size - dim, reserve_size, dim) = temp_cols;

std::cout << "----- TEST Marg: 将变量移动到右下角-----" << std::endl;
std::cout << H_marg << std::endl;

// 开始 marg : schur
double eps = 1e-8;
int m2 = dim;
int n2 = reserve_size - dim; // 剩余变量的维度
Eigen::MatrixXd Amm = 0.5 * (H_marg.block(n2, n2, m2, m2) + H_marg.block(n2, n2, m2, m2).transpose());

Eigen::SelfAdjointEigenSolver<Eigen::MatrixXd> saes(Amm);
Eigen::MatrixXd Amm_inv = saes.eigenvectors() * Eigen::VectorXd(
    (saes.eigenvalues().array() > eps).select(saes.eigenvalues().array().inverse(), 0)).asDiagonal() *
    saes.eigenvectors().transpose();

// TODO:: home work. 完成舒尔补操作
Eigen::MatrixXd Arm = H_marg.block(0, n2, n2, m2);
Eigen::MatrixXd Amr = H_marg.block(n2, 0, m2, n2);
Eigen::MatrixXd Arr = H_marg.block(0, 0, n2, n2);

Eigen::MatrixXd tempB = Arm * Amm_inv;
Eigen::MatrixXd H_prior = Arr - tempB * Amr;
```

结果输出：

```

----- TEST Marg: before marg-----
      100      -100      0
    -100  136.111  -11.1111
      0  -11.1111  11.1111
----- TEST Marg: 将变量移动到右下角-----
      100      0      -100
      0  11.1111  -11.1111
    -100  -11.1111  136.111
----- TEST Marg: after marg-----
  26.5306  -8.16327
-8.16327  10.2041

```