a)

```
x = [70.25 67 60]'; y = [68 68.5 64.5]'; m = 3; n =2;


G = [x ones(m,1)];
sig = 1e-3;
tolr = 1e-8;
tolx = 1e-16;
p = 1;
maxiter = 5;

W = (1/sig)*eye(m);
Gw = W*G;
yw = W*y;

ML1 = irls(Gw, yw, tolr, tolx, p, maxiter); % irls function
ML1
```

```
ML1 = 2×1
    0.3562
   43.1289
```

b

```
q = 1e4; % no 0f monte carlo simulations
n = 2; % no of parameters

noise = sig*randn(m,q);

db = G*ML1;

M = zeros(q,n);

for i = 1:q
    di = (db + noise(:,i));
    dw = di./sig;
    ML1i = irls(Gw, dw, tolr, tolx, p, maxiter);
    M(i,1) = ML1i(1); M(i,2) = ML1i(2);
end


mbar = mean(M); % mean
A = M - repmat(mbar,[q],[1]);
Ai = sort(A);
sigi = Ai(0.95*q,:);

%for a
ct1 = ML1(1) - sigi(1);
ct2 = ML1(1) + sigi(1);
```

```
Confidence_interval_a = [ct1 ct2]
```

```
Confidence_interval_a = 1×2
    0.3560    0.3564
```

```
%for b
ct11 = ML1(2) - sigi(2);
ct22 = ML1(2) + sigi(2);

Confidence_interval_b = [ct11 ct22]
```

```
Confidence_interval_b = 1×2
   43.1145   43.1434
```

```
fprintf("They give as the region in which our estimates lie in")
```

```
They give as the region in which our estimates lie in
```