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Example of database for database consisting of 6 species

```
% Species 1 data
h1=3.9; %gives the seeding depth in cm for species 1
r1=1.2; %distance between seeding positions in metre for species 1
% Species 2 data
h2=4.2;
r2=2.5;
% Species 3 data
h3=5.0;
r3=3.0;
% Species 4 data
h4=1.2;
r4=3.2;
% Species 5 data
h5=2.7;
r5=0.8;
% Species 6 data
h6=3.3;
r6=0.7;
```

The following section defines parameters for seeding operation, such as travelling velocity of the robot

```
v=4.0; %sets the traveling velocity of the robot to 4ms^-1
lambda=8; %sets the constant drilling rate to 8mms^-1
sigma1=340; %sets the number of seeds of species 1 to be planted to
 340
sigma2=450;
sigma4=800;
sigma5=630; %note how species 3 and 6 do not occur here--> only
 species 1,2,4,5 are being planted
Tbat=3.0; %sets battery life-time to 3hours
tau=25; %sets average travel time back to station for new battery or
 refilling
C1=60; %set that capacity of seed dispensor to 60 seeds of species 1
```

```
C2=30;
C4=80;
C5=20;
N=14; %sets the total number of robots to 14
N1=3; %assigns 3 robots to the task of seeding species 1
N2=6;
N4=2;
N5=3;
```

The following section begins calculation

```
if N1+N2+N4+N5 <= N %checks for the condition that the total number of
 robots assigned does not exceed N
    h=[h1 h2 h4 h5]; %puts all constant for species in an array to
 ease sum calculation
    r=[r1 r2 r4 r5];
    sigma=[sigma1 sigma2 sigma4 sigma5];
    C=[C1 C2 C4 C5];
    Njob=[N1 N2 N4 N5]; %puts the assigned occuption in an array
    T=[]; %starts with an empty array in which the calculated times
 will be stored
    for j=1:1:length(h) %will calculate the time per species needed
 for operation
        refills=ceil(sigma(j)/C(j)); %calculates the required number
 of refills
        trefil=2*tau*60*refills; %calculates the time spend travelling
 to station for refilling seeds, corrected for time in minutes
        tdrill=1.2*sigma(j)*h(j)/(lambda/10); %calculates the time
 spent drilling 1 hole, taking into account unit conversion
        ttrav=(sigma(j)-1)*r(j)*100/v; %calculates the time spent
 travelling between seeding positions, correct for position in m
        twork=trefil+tdrill+ttrav; %calculates the total time for the
 operation
        recharges=ceil(twork/(Tbat*3600)); %calculates the required
 umber of refills, corrected for battery time in hour
        trecharge=2*tau*60*recharges; %calculates the time spent
 travelling to station for recharing
        ttotal=twork + trecharge; %calculates actual time spend on the
 job
        T=[T [ttotal]]; %import the value for total time to the array
 T
    end
else disp('Total number of assigned robots exceeded available robots,
 please reevalute')
end
```

Next the actual workload is considered

```
treal=T./Njob; %divides all values of T by the number of robots
 assigned to get the real time,
% as all robots will be working together at the same time
texpected=max(treal); %the expected operating time will be the maximum
 operating time for the total operation
```

```
numberofdays=floor(texpected/(24*60*60)); %calculates the number of
 days required for the operation
numberofhours=floor(mod(texpected,(24*60*60))/(60*60)); %calculates
 the number of hours required for the operation
numberofminutes=floor(mod(mod(texpected,(24*60*60)),
(60*60))/60); %calculates the number of minutes
numberofsecond=floor(mod(mod(mod(texpected,(24*60*60)),
(60*60)),60)); %calcultes the number of seconds

sprintf('The expected reforestation is %02d days, %01d hours, %1d
 minutes, %1d seconds.', numberofdays, numberofhours,numberofminutes,
 numberofsecond)
```

```
ans =

    'The expected reforestation is 00 days, 16 hours, 59 minutes, 40
 seconds.'
```

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