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Assignment-03

Exercise-01:

```matlab
p=input('How many test cases : ');
for j=1:p
    n = input('Enter a number : ');
    if n<0
        T=[];
    else
        if n==0
            T=[0 0];
        else
            T = [0, 0, 1];
            for i=4:n+3
                k=T(i-1)+T(i-2)+T(i-3);
                if k>n
                    break
                end
                T(i) = k;
            end
        end
    end
    Input = n
    Output = T
end
```

```
Input = 15
Output = 1×8
     0     0     1     1     2     4     7     13
Input = 4
Output = 1×6
     0     0     1     1     2     4
Input = 100
Output = 1×11
     0     0     1     1     2     4     7     13     24     44     81
Input = -4
Output =

     []
```

Exercise-02

```matlab
t=input('How many test cases : ');
for i=1:t
    n=input('Enter number :');
    b=primes(n);
    V=b(6:end);
    C=num2str(V');
```

```matlab
    C_rev=C(:, end:-1:1);
    V_rev=str2num(C_rev)';
    Input= n
    Output= V(isprime(V_rev))
end
```

```
Input = 20
Output = 1×2
    13    17
Input = 100
Output = 1×8
    13    17    31    37    71    73    79    97
Input = 12
Output =

    []
Input = 1000
Output = 1×51
    13    17    31    37    71    73    79    97   101   107   113   131   149 ···
```

Exercise-03:

```matlab
t6=input('How many test cases : ');
for i=1:t6
    Input= input('Enter a positive integer: ');
    n=Input;
    seq = n;
    while n > 1
        n = (mod(n,2)==0)*(n/2) + (mod(n,2)==1)*(3*n+1);
        seq(end+1) = n;
    end
    Input
    Output=seq
end
```

```
Input = 13
Output = 1×10
    13    40    20    10     5    16     8     4     2     1
Input = 100
Output = 1×26
   100    50    25    76    38    19    58    29    88    44    22    11    34 ···
```

Exercise-04:

```matlab
t1=input('How many test cases : ');
for i=1:t1
    r = input("Enter an Array : ");
    output = [];
    for i = 1:(length(r)-1)
        if r(i+1) > r(i)
            output(end+1) = r(i+1);
        end
    end
    Input=r
```

```
```

```
Input = 1×6
     1     3     2     4     3     5
output = 1×3
     3     4     5
Input = 1×10
     5     5    10     2    10    20     5     2     2    20
output = 1×4
    10    10    20    20
Input = 1×7
     0     0     0     0     0     0     0
output =

     []
```

Exercise-05:

```
t2=input('How many test cases : ');
for i=1:t2
    r=input("Enter an Array : ");
    n=length(r);
    output=zeros(size(r));
    for i=1:2:(n-1)
        output(i)=r(i+1);
        output(i+1)=r(i);
    end
    if mod(n,2)==1
        output(n)=r(n);
    end
    Input=r
    output
end
```

```
Input = 1×6
     1     2     3     4     5     6
output = 1×6
     2     1     4     3     6     5
Input = 1×3
     3     4     5
output = 1×3
     4     3     5
Input = 1×6
     2    -2     4    -4    10   -10
output = 1×6
    -2     2    -4     4   -10    10
```

Exercise-06:

```
t3=input('How many test cases : ');
for i=1:t3
    r=input('Enter the array : ');
    target=input('Enter the target sum: ');
    pairs=[];
```

3

```matlab
        n=length(r);
        for i=1:(n-1)
            for j=i+1:n
                if r(i)+r(j)==target
                    a=min(r(i),r(j));
                    b=max(r(i),r(j));
                    pairs(end+1,:)=[a,b];
                end
            end
        end
        if ~isempty(pairs)
            pairs=unique(pairs,'rows');
        end
        Input=r
        Target=target
        Output=pairs
end
```

```
Input = 1×5
    1     2     3     4     5
Target = 6
Output = 2×2
    1     5
    2     4
Input = 1×3
   15     5    20
Target = 25
Output = 1×2
    5    20
Input = 1×3
   15     5    20
Target = 3
Output =

    []
Input = 1×15
    5     1     3     7     5     9     2     8     4     6     0    -1    10 · · ·
Target = 10
Output = 6×2
    0    10
    1     9
    2     8
    3     7
    4     6
    5     5
```

Exercise-07:

```matlab
t4=input('How many test cases : ');
for i=1:t4
r=input('Enter the array : ');
y=sum(r(1:2:end))-sum(r(2:2:end));
Input=r
Output=y
end
```

```
Input = 1×5
     2     5     4     6     1
Output = -4
```
```
Input = 1×40
     0     1     0     1     0
Output = 20
```

Exercise-08:

```matlab
t5=input('How many test cases : ');
for i=1:t5
    r=input('Enter the array : ');
    Input=r
    n=length(r);
    seen=[];
    found=false;
    for j=1:n
        if any(seen==r(j))
            fprintf('First duplicate: %d\n', r(j));
            found=true;
            break;
        else
            seen(end+1)=r(j);
        end
    end
    if ~found
        disp('No duplicates found');
    end
end
```

```
Input = 1×7
     2     5     1     2     3     5     1
First duplicate: 2
Input = 1×5
     1     2     3     4     5
No duplicates found
Input = 1×10
     2     5     1    10     3     5     1     1     1     2
First duplicate: 5
```