Computational Mathematics I

Mixing MATLAB built-in functions to do the following by one line statement in command window

Q1:- From the n by m matrix find the minimum positive number

Let

a=[6 -1 7 3;5 2 8 -4;9 -5 -2 0]

>>a =

```
    6     -1      7       3
    5      2      8      -4
    9     -5     -2       0
```

>>minpsitive=min(min(a(a>0)))

minpsitive =

     2

Q2:- Find the number of negative prime elements in n by m matrix

>>numberofnegativeprime=length(a(isprime(abs(a))&a<0))

numberofnegativeprime =

     2

Q3:- Find the number of odd elements in each colum from n by m matrix

```
>>numberofoddineachcolum=sum(rem(abs(a),2))

numberofoddineachcolum =

     2     2     1     1
```

Q4:- Find the minimum number of upper triangle of n by n matrix

```
 >>b=[2 0 -1;4 1 7;5 6 3]

b =

     2     0    -1
     4     1     7
     5     6     3

>> min(min(tril(NaN*ones(3))+triu(b,1)))

ans =

    -1
```

Q5:-Create the following n by m matrix

$$a = \begin{pmatrix} e^1 & n & n & & n & n \\ m & e^2 & n & \cdots & n & n \\ m & m & e^3 & & n & n \\ & \vdots & & \ddots & & \vdots \\ m & m & m & \cdots & e^n & n \end{pmatrix}$$

```
>>n=4;m=6;
>>m*tril(ones(n,m),-1)+[diag(exp(1:n))  zeros(n,m-n)]+
  +n*triu(ones(n,m),1)

>>ans =

    2.7183    4.0000    4.0000    4.0000    4.0000
4.0000
```

```
    6.0000      7.3891      4.0000      4.0000      4.0000
4.0000
    6.0000      6.0000     20.0855      4.0000      4.0000
4.0000
    6.0000      6.0000      6.0000     54.5982      4.0000
4.0000
```

Q6:- Find the location (sub) of maximum element in n by
      m matrix
>> [i j]=find(a==max(max(a)))

i =

    3
j =

    1
Q7:- Find the sum of integer elements in n by m matrix
      >> sum(a(fix(a)==a))

Q8:- Replace the diagonal elements in square matrix by
ones
      >> b=[1 2 3;4 5 6;7 8 9]

    b =

       1   2   3
       4   5   6
       7   8   9

      >> tril(b,-1)+eye(3)+triu(b,1)

    ans =

       1   2   3
       4   1   6
       7   8   1

Q9:-Create the following n by m matrix

$$a = \begin{pmatrix} 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 2 & 3 & 0 \\ 0 & 4 & 5 & 6 & 0 \\ 0 & 7 & 8 & 9 & 0 \end{pmatrix}$$

```
>> [ones(1,5); [zeros(3,1) reshape(1:9,3,3)
zeros(3,1)]]
ans =
     1     1     1     1     1
     0     1     4     7     0
     0     2     5     8     0
     0     3     6     9     0
```

Q10:- Let

$$a = \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix} \qquad b = (0 \quad 0 \quad 0) \qquad c = \begin{pmatrix} -1 & -1 \\ -1 & -1 \end{pmatrix}$$

```
1->> [a b'; c c]
ans =
     1     4     7     0
     2     5     8     0
     3     6     9     0
    -1    -1    -1    -1
    -1    -1    -1    -1
```

```
2->> [[a;b] [c;c]]
    ans =
     1     4     7    -1    -1
     2     5     8    -1    -1
     3     6     9    -1    -1
     0     0     0    -1    -1
```

```
3- >> [a(:,[3 1]) b' a(:,2)]
    ans =
     7     1     0     4
     8     2     0     5
```

```
     9      3      0      6

4- >> [a [c c c;b b]]
    ans =
    1      4      7     -1     -1     -1     -1     -1     -1
    2      5      8     -1     -1     -1     -1     -1     -1
    3      6      9      0      0      0      0      0      0

5- >> a(2:3,2:3)=c
   a =
    1      4      7
    2     -1     -1
    3     -1     -1

6- >> a(:,1)=b'
   a =
    0      4      7
    0     -1     -1
    0     -1     -1
```

Q11:-From n by m matrix A replace the element in corners by 0.

```
   >>A([1 size(A,1)],[1 size(A,2)])=0
```

Q12:- Let u and v be vectors of coefficients of two
      polynomials then find the sum of polynomials

```
   [zeros(1,length(v)-length(u))
    u]+[zeros(1,length(u)-length(v)) v]
```

Q1) Write a script or function to remove all repeat elements in the input row array.

Q2) Write a script or function to find the number of repeat for each elements of input matrix.

Q3) Write a script or function to input two matrices then find out the same rows between them if exist.

Q4) Write a script or function to check increasing and decreasing of the sequence.

Q5) Rectangle plane with width W and length L divided to n by m square and each square contain a greeters circle then find the area that covered by circles.

Q1) Write a script to read a matrix a then change the location of maximum number and minimum number between them.

```
SOL1)    a=input('input the matrix:')
         imax=find(a==max(max(a)));
         imin=find(a==min(min(a)));
         temp=a(imax);or temp=max(max(a));
         a(imax)=a(imin);or a(imax)=min(min(a));
         a(imin)=temp;
         disp(a)
```

H.w2) Write a script to read the number n then find S where $S = 2 + 2^2 + 2^3 + \cdots + 2^n$

```
SOL2)    n=input('n=');
         S=sum(2.^(1:n))
```

Q3) Write a script for students degree and sort them according to passed.

```
SOL3)    a=input('input the matrix of student degree:')
         k=all(a>=50,2);
```

```
suc=a(k,:);
fal=a(~k,:);
stsum=sum(suc,2);
[stsum xi]=sort(stsum,'descend');
suc=suc(xi,:);
sucdeg=[suc  stsum]
```

Quez4) Write a script to solve a linear system aX=b.

SOL4)   a=input('a=');
         b=input('b=');
         X=inv(a)*b

Q5) Write a script to solve a linear system aX=b by grammer rule.

SOL5)   a=input('a=');
         b=input('b=');
         X1=det([b a(:,2:3)])/det(a)
         X2=det([a(:,1) b a(:,3)])/det(a)
         X3=det([a(:,1:2) b])/det(a)

Quez6) Write a script to find $c = a * b + a^2$ where a and b are a matrix.

   SOL6)

         a=input('a=')
         b=input('b=')
         if size(a,2)==size(b,1)&size(a)==size(b)
         c=a*b+a^2
         end

Quez7) Write a script or function to input the number then check that even integer
     number or not.

SOL7)   a=input('a=')
         If (fix(a/2)==a/2)
         fprintf('the number %g is even',a)
         else
```

```
        fprintf('the number %g is odd',a)
        end
```

Q8) Write a script to find all roots of polynomial is real or not

SOL8)   p=input('p=')
        r=roots(p);
        If(all(r==real(r)))
        disp('all roots are real')
        else
        disp('all roots are not real')
        end

Q9) Write a program to input x then find

$$y = \begin{cases} \sin(x) & 0 \le x < 1 \\ e^{|x|} + 2 & x < 0 \\ x^2 + 3 & 1 \le x < 10 \\ \dfrac{1}{x} & x \ge 10 \end{cases}$$

Quez10) write a program to input two matrix a, b then   find c=a.*b+$|a|$I-b^{-1}

SOL10) a=input('a=')
        b=input('b=')
        if size(a)==size(b)&size(b,1)==size(b,2)
        c=a.*b + det(a)*eye(size(a)) - inv(b)
        end

Quez11) write a program to input matrix $a_{n\times m}$ then find $s = \sum_{i=1}^{n*m} f(a_i)$

When $f(a_i) = \begin{cases} |a_i| & a_i < 0 \\ 1 & if\ a_i\ is\ positive\ prime\ number \\ 0 & other\ wise \end{cases}$

SOL11) a=input('a=')
        s=0;
        for i=1:numel(a)
        if a(i)<0
        a(i)=abs(a(i));
        elseif isprime(abs(a(i)))&a(i)>0

```
       a(i)=1;
        else
       a(i)=0;
       end
       s=s+a(i);
       end
       disp(s)
```

Q12) write a program to transform the decimal number to binary

SOL12) First Method
```
       a=input('a=')
        s=0;
        while a~=0
        s=[rem(a,2) s];
        a=fix(a/2);
        end
        s=s(1:length(s)-1)
```
OR
Secand Method

```
       a=input('a=')
       b=[];
       while a>0
       b=[rem(a,2)  b];
       a=fix(a/2);
       end
       b
```

Q13) write a program to input the matrix then find out even element and odd element.

SOL13)   a=input('the matrix a=')
```
        for i=1:prod(size(a))            (by index)
(prod(size(a))=numel(a))
        if rem(a(i),2)==0
        fprintf('the matrix %g is even\n',a(i))
        else
        fprintf('the  matrix  %g  is odd\n',a(i))
```

```
    end
    end
```

Q14) write a program to input the matrix then find the summation of even number
and summation of odd number in a.

SOL14) a=input('the matrix a=')
        ev=0;od=0;
        for i=1:prod(size(a))   (by index) (prod(size(a))=numel(a))
        if rem(a(i),2)==0
        ev=ev+a(i);
        else
        od=od+a(i);
        end
        end
        ev
        od

Q15) write a program to create matrix $A_{n \times m}$ when $a_{i,j} = i + j^2$.

SOL15) z=input('the dimention a=')
        a=zeros(z);
        for i=1:size(a,1)
          for j=1:size(a,2)
           a(i,j)=i+j^2;
          end
        end
        a

Q16) write a script to read x then find y where $y = \begin{cases} \sin(x) & x > 0 \\ 2 + e^x & x < 0 \\ 7 & x = 0 \end{cases}$ by switch

case?

SOL16) x= input('input the number');
        switch true
        case x>0
        y=sin(x)

```
    case x<0
    y=2+exp(x)
    otherwise
  y=7
  end
```

Quez17) write a script to create a matrix $A_{n \times m}$ where

$$a_{i,j} = \begin{cases} 3^i + j & if \ i + j \ is \ prime \ number \\ 2^j + i & if \ i + j \ is \ even \ number \\ 1 & other \ wise \end{cases}$$

Quez18) write a program to read a matrix $A_{n \times m}$ then find $p = \prod_{i=1}^{n \times m} f(a_i)$ where

$$f(a_i) = \begin{cases} 3^i + 1 & if \ a_i \ is \ prime \ number \\ 2^i + 1 & if \ a_i \ is \ not \ prime \ number \end{cases}$$

Q19) write a program to create a matrix $A_{n \times m}$ where

$$a_{i,j} = \begin{cases} 0 & if \ i,j \ is \ odd \ number \\ 1 & if \ i,j \ is \ even \ number \\ -1 & otherwise \end{cases}$$

Quez1) write a program to read a matrix a then find b where

$$b = \begin{cases} a^{-1} & if \ |a| > 0 \\ a^2 & if \ |a| = 0 \\ a^{-1} * a & if \ |a| < 0 \end{cases}$$

Quez2) write a program to read a matrices a and b then find c where

$$c = \begin{cases} a + b & if \ a \ and \ b \ have \ the \ same \ size \\ |a| \ I + a & otherwise \end{cases}$$

Quez3) write a program to read the real number x then find y where

$$y = \begin{cases} \ln(x + 1) & x > 0 \\ e^{x^2+1} & x < 0 \ and \ |x| \ is \ odd \\ \sqrt{|x - 2|} & x < 0 \ and \ |x| \ is \ even \end{cases}$$

Q20) write a program to input the integer number n then find the Fibonacci sequence.

$$f_1 = 1, f_2 = 1 \text{ and } f_n = f_{n-1} + f_{n-2}$$

Sol)   n=input('n=');
       f = zeros(1,n);
       f(1) = 1;
       f(2) = 1;
       for j = 3:n
       f(j) = f(j-1) + f(j-2);
       end
       f

Q1) Write a script to read a matrix a then change the location of maximum number and minimum number between them.

SOL1)   a=input('input the matrix:')
          imax=find(a==max(max(a)));
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          temp=a(imax);**or** temp=max(max(a));
          a(imax)=a(imin);**or** a(imax)=min(min(a));
          a(imin)=temp;
          disp(a)

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SOL4)
```
a=input('a=');
b=input('b=');
X=inv(a)*b
```

Q5) Write a script to solve a linear system aX=b by grammar rule.

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```
a=input('a=');
b=input('b=');
X1=det([b  a(:,2:3)])/det(a)
X2=det([a(:,1)  b  a(:,3)])/det(a)
X3=det([a(:,1:2)  b])/det(a)
```

Quez6) Write a script to find $c = a * b + a^2$ where a and b are a matrix.

SOL6)

```
a=input('a=')
b=input('b=')
if size(a,2)==size(b,1)&size(a)==size(b)
c=a*b+a^2
end
```

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SOL7)
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```

```
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```

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        end

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Quez10) write a program to input two matrix a, b   then find c=a.*b+|a|I-b^{-1}

SOL10) a=input('a=')
        b=input('b=')
        if size(a)==size(b)&size(b,1)==size(b,2) & det(b)~=0
        c=a.*b + det(a)*eye(size(a)) - inv(b)
        end

Quez11) write a program to input matrix $a_{n\times m}$ then find $s = \sum_{i=1}^{n*m} f(a_i)$

When $f(a_i) = \begin{cases} |a_i| & a_i < 0 \\ 1 & if\ a_i\ is\ positive\ prime\ number \\ 0 & other\ wise \end{cases}$

SOL11) a=input('a=')
        s=0;
        for i=1:numel(a)
        if a(i)<0

```
a(i)=abs(a(i));
elseif isprime(abs(a(i)))&a(i)>0
a(i)=1;
else
a(i)=0;
end
s=s+a(i);
end
disp(s)
```

Q13) write a program to input the matrix then find out even element and odd element.

```
SOL13)  a=input('the matrix a=')
        for i=1:prod(size(a))            (by index)
(prod(size(a))=numel(a))
        if rem(abs(a(i)),2)==0
        fprintf('the matrix %g is even\n',a(i))
        else
        fprintf('the  matrix  %g  is odd\n',a(i))
        end
        end
```

Q14) write a program to input the matrix then find the summation of even number and summation of odd number in a.

```
SOL14)  a=input('the matrix a=')
        ev=0;od=0;
        for i=1:prod(size(a))             (by index)  (prod(size(a))=numel(a))
        if rem(abs(a(i)),2)==0
        ev=ev+a(i);
        else
        od=od+a(i);
        end
        end
        ev
        od
```

Q15) write a program to create matrix $A_{n\times m}$ when $a_{i,j} = i + j^2$.

SOL15) z=input('the dimention a=')
    a=zeros(z);
   for i=1:size(a,1)
    for j=1:size(a,2)
    a(i,j)=i+j^2;
    end
   end
   a

Q16) write a script to read x then find y where $y = \begin{cases} \sin(x) & x > 0 \\ 2 + e^x & x < 0 \\ 7 & x = 0 \end{cases}$ by switch case?

SOL16) x= input('input the number');
    switch true or 1
    case x>0
    y=sin(x)
    case x<0
    y=2+exp(x)
    otherwise
   y=7
   end

Quez17) write a script to create a matrix $A_{n\times m}$ where

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Quez18) write a program to read a matrix $A_{n\times m}$ then find $p = \prod_{i=1}^{n\times m} f(a_i)$ where

$$f(a_i) = \begin{cases} 3^i + 1 & if\ a_i\ is\ prime\ number \\ 2^i + 1 & if\ a_i\ is\ not\ prime\ number \end{cases}$$

Q19) write a program to create a matrix $A_{n \times m}$ where

$$a_{i,j} = \begin{cases} 0 & \text{if } i,j \text{ is odd number} \\ 1 & \text{if } i,j \text{ is even number} \\ -1 & \text{otherwise} \end{cases}$$

Quez1) write a program to read a matrix a then find b where

$$b = \begin{cases} a^{-1} & \text{if } |a| > 0 \\ a^2 & \text{if } |a| = 0 \\ a^{-1} * a & \text{if } |a| < 0 \end{cases}$$

```
Sol)   a=input('a=');
switch true
     case det(a)>0
          b=inv(a)*a
     case det(a)==0
          c=a^2
     otherwise
          d=-inv(a)*a
end
```

Quez2) write a program to read a matrices a and b then find c where

$$c = \begin{cases} a + b & \text{if } a \text{ and } b \text{ have the same size} \\ |a| \, I + a & \text{otherwise} \end{cases}$$

```
Sol)
a=input('a=')
b=input('b=')
c=0;
if size(a)==size(b)
     c=a+b
elseif size(a,1)==size(a,2)
     d=det(a)*eye(size(a))+a
end
```

Quez3) write a program to read the real number x then find y where

$$y = \begin{cases} \ln(x+1) & x > 0 \\ e^{x^2+1} & x < 0 \text{ and } |x| \text{ is odd} \\ \sqrt{|x-2|} & x < 0 \text{ and } |x| \text{ is even} \end{cases}$$

Q20) write a program to input the integer number n then find the Fibonacci sequence.

$$f_1 = 1, f_2 = 1 \text{ and } f_n = f_{n-1} + f_{n-2}$$

Sol)   n=input('n=');
        f = zeros(1,n);
        f(1) = 1;
        f(2) = 1;
        for j = 3:n
        f(j) = f(j-1) + f(j-2);
        end
        f

Or the summation
b=1;a=1;
for j=3:100
c=a+b;
a=b;b=c;
end
disp(c)

While loop

Q) Write a program to transform the decimal number to binary

Sol) First Method
        a=input('a=')
        s=0;
        while a~=0
        s=[rem(a,2) s];

```
        a=fix(a/2);
        end
        s=s(1:length(s)-1)
OR
Secand Method

        a=input('a=')
        b=[];
        while a>0
        b=[rem(a,2)  b];
        a=fix(a/2);
        end
        b
```

Q) Write a program to convert the binary number to decimal number?

```
x=input('x=');
s=0;i=0;
while x~=0
    z=(x/10-fix(x/10))*10;
    s=s+z*2^i;
    i=i+1;
    x=fix(x/10);
end
s
```

Q) Write a program to input the integer number then find the number of digit.
```
        a=input('a=')
        i=0;
        while a~=0
            a=fix(a/10);
            i=i+1;
        end
        i
```

Q) Write a program to read the values of **x** and **y** then computes the summation,

$$S = y + \frac{y+1}{x+2} + \frac{y+3}{x+4} + \frac{y+6}{x+6} + \frac{y+10}{x+8} + \cdots T \qquad where \quad T < 10^3 .$$

Q1) write a program to input the number x then find s where

$$s = \frac{x^{\frac{1}{2}}}{9} + \frac{x^{\frac{1}{4}}}{27} + \frac{x^{\frac{1}{8}}}{81} + \cdots + \frac{x^{\frac{1}{2(n)}}}{3^{n+1}} \quad until \quad \frac{x^{\frac{1}{2(n)}}}{3^{n+1}} \leq 0.001$$

Q2) write a program to find the value of $s = \frac{5}{x} + \frac{x^2}{6} + \frac{8}{x^3} + \frac{x^4}{11} + \cdots + stop$ where the value of last term >23, x is positive number.

Sol) x=input('x=');
If x~=0
k=5;
i=1;
t=k/x^i;
while t<=23
t= (k/x^i)^((-1)^(i+1));
s=s+t;
k=k+i;
i=i+1;
end
s
end

Q3) write a program to input the number x then find s where x>1 and

$$s = \sum_{n=1}^{\infty} \frac{n}{x^n}$$

Ans) x=input('x=')
n=1; s=0;
while $\frac{n}{x^n}$ >eps
s=s+$\frac{n}{x^n}$;
n=n+1;
end
s

Q3) write a program to input the number then check out is prime or not?

Q4) write a program to input the positive integer n then find all prime number between 1and n?

Q) Write a program to input an integer number then find all divisor of it.

Quiz) write a program to input x y and n then find s where

1) $s = \frac{x}{1!} + \frac{2!}{x^2} + \frac{x^3}{3!} + \frac{4!}{x^4} + \frac{x^5}{5!} \dots up\ to\ n\ term .$

2) $s = \frac{x}{3!} + \frac{y}{6!} + \frac{x^2}{9!} + \frac{y^2}{12!} + \frac{x^3}{15!} + \cdots up\ to\ n\ term .$

3) $s = \frac{2}{1!} + \frac{x^2}{2!} + \frac{4}{3!} + \frac{x^4}{4!} + \frac{6}{5!} + \frac{x^6}{6!} + \cdots up\ to\ n\ term .$

4) $s = \frac{x}{2!} + \frac{x^2}{4!} + \frac{y^4}{6!} + \frac{x^4}{8!} + \frac{x^5}{10!} + \frac{y^7}{12!} + \cdots up\ to\ n\ term .$

Function

Exam) Write a MATLAB function to find the average of non-zero elements in lower triangle of input matrix (using *if*, *for* statements).

Sol)
```
function av = avlm(a)
s=0;l=0;
for i=1:size(a,1)
    for j=1:size(a,2)
```

```
            if i<j && a(i,j)~=0

                s=s+a(i,j);

                l=l+1;

            end

        end
```

H.W) Write a script or function to output all repeat elements in the input row array.

H.W) Write a script or function to remove all repeat elements in the input row array.

Sol)   a=input('a=');
            i=1;a=sort(a);
while i<length(a)
          if a(i)==a(i+1)
        a= [a(1:i)   a(i+2:length(a))];
      continue
          end
     i=i+1;
   end
  a

Exam) Write a Matlab script to find the number of repeat maximum in each row of input n by m dimension matrix then sorting the matrix rows according to number of maximum.

Sol)
```
    a=input('a=');
    mx=max(a,[],2);
    nomx=zeros(size(mx));
    for i=1:size(a,1)
        nomx(i)=sum(a(i,:)==mx(i));
        disp(['the no. of max. in row ' num2str(i) ' is
    ' num2str(nomx(i))]);
    end
    [s v]=sort(nomx);
    b=a(v,:)
```

Exam) Write a Matlab script to find the number of repeat for each element in main diagonal of input square matrix.

```
Sol) a=input('a=');
     b=diag(a);
     c=sort(b);
     for i=length(c):-1:2
       if c(i)==c(i-1)
           c(i)=[];
       end
     end
     n=zeros(size(c));
     for i=1:length(c)
       n(i)=sum(b==c(i));
     disp([num2str(c(i)) ' has ' num2str(n(i)) '
   repeat'])
     end
```

Q1) Write a program to input two strings then find the number of common latters between them.

Q2) Write a program to draw graph of input function and interval, use string.

Q3) Write a program to draw surface of input function and region, use string.

Q4) write a program to find the sum of two binary numbers, use string.

Q5) write a program to find the multiply of two binary numbers, use string.

Q6) write a program to find the sum of two hexadecimal numbers, use string.

Q7) write a program to input string then remove repeated character in it.

Q8) write a program to input string then separated Caps letters, small letters, digits and symbols.

Q1) Write a program to input the decimal number then converts to the hexadecimal.

Sol) a=input('a=') ;

    b= [];

   While (a>0)

   r=rem(a, 16);

   If r>9

   b= [char(r+abs('A')-10) num2str(b)];

   else

  b= [num2str(r) num2str(b)];

  end

  a=fix(a/16);

  end

  b

H.W) Write a program to input the hexadecimal number then converts it to the decimal number.

Sol) a=input('a=','s');
s=0;
for i=1:length(a)
if a(i)>='A' & a(i)<='G'
s=s+(abs(a(i))-abs('A')+10)*16^(length(a)-i);
else
 s=s+str2num(a(i))*16^(length(a)-i);
end
end
s

Q) Write a program to input number then finds the sum of even digits in it.

```
x=input('x=');
y=num2str(x);
s=0;
for i=1:length(y)
    z=str2num(y(i));
    if mod(z,2)==0
        s=s+z;
    end
end
disp(['the sum of even digits is ' num2str(s)])
```

Q2) Write a program to input the string then finds all small letters.

Sol) a=input('a=','s') ;

B=[];

For i=1:length(a)

If a(i)>='a' & a(i)<='z'

b= [b a(i)];

end

end

b

Quiz1) Write a program to input the string then removes all space between them.

Sol3) First Method

a=input('a=','s') ;

```
i=1; b=length(a);

while(i<b)

if a(i)='  '

a(i)=[];

b=length(a);

else

i=i+1;

end

end

a
```

Second method

```
a=input('a=','s');

b=[];

for i=1:length(a)

if a(i)~= ' '

b=[b a(i)];

end

end

b
```

Quiz2) Write a program to input the string then finds all prime number between them.

```
Sol)
a=input('a=','s');
b=[];
for i=1:length(a)
    if a(i)<='9' & a(i)>='0' & isprime(str2num(a(i)))
```

```
            b=[b a(i)];
        end
end
b
```

Quiz3) Write a program to input a string then finds the summation of all even numbers between them.

Sol)
```
a=input('a=','s');
s=0;
for i=1:length(a)
    if rem(str2num(a(i)),2)==0 & a(i)>='0' & a(i)<='9'
        s=s+str2num(a(i));
    end
end
s
```

Quiz4) Write a program to input the string then convert all small letters to Capital letter and convert all capital letter to small letter.

Sol)
```
a=input('a=','s');
b=[];
for i=1:length(a)
    if a(i)<='Z' & a(i)>='A'
        b=[b lower(a(i))];
    else
        b=[b upper(a(i))];
    end
end
b
```

H.W) Write a program to input string then separated Capital letters, small letters, digits and symbols.

```
a=input('a=','s')
sc=[];ss=[];sd=[];sb=[];
for i=1:length(a)
    if a(i)>='a'& a(i)<='z'
        ss=[ss a(i)];
    elseif a(i)>='A'& a(i)<='Z'
        sc=[sc a(i)];
         elseif a(i)>='0'& a(i)<='9'
        sd=[sd a(i)];
    else
        sb=[sb a(i)];
    end
end
ss
sc
sd
sb
```

Exam) Write Matlab a function to find the sum of digits in the input string.

Sol)
```
function sd = eq5(st)
sd=0;
    dg=st(st<='9'& st>='0');
    for i=1:length(dg)
        sd=sd+str2num(dg(i));
    end
end
```

Exam) Write Matlab a function to convert small latters to capital in input string.

Sol)
```
function oust = eq5(inst)
for i=1:length(inst)
if inst(i)>='a'&&inst(i)<='z'
```

```
        inst(i)=upper(inst(i));
end
oust=inst;
end
```