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كلية التربية

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نموذج اجابة – ورقة كاملة

المـــــادة: مقدمة في برمجة الحاسوب

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Answer the following questions:

Question 1:

a) Given the array x =[0 3 2 -1 5 4] and A=[-1 0 0;1 0 -1;2 1 3].
What is the result of the following statements?
1) y = x(2:end)   2) A(:,3)./A(:,1)   3) A(1:2:3,:)   4) A(3,:) = []
5) b = A*x(1:3)'   6) diag(A)   7) A .^2   8) size(A)
9) length(x)   10) mean(x)   11) max(A(:))   12) [A; x(1:3)]
13) sum([x,6])   14) A(:,1) + [0 -1 2]'   15) A-3*eye(3)

b) Given x = [-3 0 3 4 -1 2 1 -2] and y = [1 -1 0 -2 0 1 2 3],
what is the result of the following commands:
1) who   2) whos   3) z = (x<1) & (y > 1)
4) x > y   5) x==y   6) sum(x <= y)
7) (x ~= 0)&(y ~= 0)   8) min(x)   9) z = sort(x)
10) S = diag(x)   11) all(x)   12) any(x)

Question 2:
What is the value after executing the following codes?
a)
```
for i = 1:3
    for j = 1:3
      A(i,j) = 1/(j+i-1);
    end
end
```

b)
```
x= 0:0.4:2
for i=1:length(x)
    if  x(i) > 1
```

```
      z(i) = x(i)^2;
    else
        z(i) = 1;
    end
end
```

Question 3:

a) Given t = 1/3, complete the following sentences
1) >> format short,   t = ...
2) >> format long,   t = ...
3) >> format short g,   t =....
4) >> format bank,   t=....
5) >> floor(t) = ...
6) >> round(t) = ...
7) >> ceil(t) = ...
8) >> fix(t) = ...

b) Write a Matlab program to compute the roots of a quadratic equation

$$f(x) = ax^2 + bx + c,$$

where the roots can be determined from the formula

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}.$$

Model Answer

a) x = [0 3 2 -1 5 4] , A=[-1 0 0;1 0 -1;2 1 3]

1) y = x(2:end)

y =

    3   2   -1   5   4

2) A(:,3)./A(:,1)

 ans =

        0
  -1.0000
   1.5000

3) A(1:2:3,:)

ans =

   -1   0   0
    2   1   3

4) A(3,:) = []

A =

   -1   0   0
    1   0   -1

5) b = A*x(1:3)'

b =

    0
   -2
    9

6) diag(A)

ans =

   -1
    0
    3

7) A.^2

ans =

    1   0   0
    1   0   1
    4   1   9

8) size(A)

ans =

   3   3

9) length(x)

ans =

   6

10) mean(x)

ans =

  2.1667

11) max(A(:))

ans =

  3

12) [A; x(1:3)]

ans =

  -1   0   0

   1   0 -1

   2   1   3

   0   3   2

13) sum([x,6])

ans=

  19

14) A(1,:) + [0 -1 2]

ans =

  -1 -1   2

15) A-3

ans =

  -2 -1 -3

  -3 -1   0

  -4 -1   0

b) x = [-3 0 3 4 -1 2 1 -2] and y = [1 -1 0 -2 0 1 2 3]

1) who

Your variables are:

x y

```
2) whos
Name      Size      Bytes      Class
 x         1x8        64         double
 y         1x8        64         double

3)  z = (x<1) & (y > 1)
z =
    0   0   0   0   0   0   0   1
4) x > y
ans =
    0   1   1   1   0   1   0   0
5) x==y
ans =
    0   0   0   0   0   0   0   0
6) sum(x <= y)
ans =
    4
7) (x ~= 0)&(y ~= 0)
ans =
    1   0   0   1   0   1   1   1
8) min(x)
ans =
   -3
9) z = sort(x)
z =
   -3   -2   -1    0    1    2    3    4


10) S = diag(x)
S =
   -3    0    0    0    0    0    0    0
    0    0    0    0    0    0    0    0
    0    0    3    0    0    0    0    0
    0    0    0    4    0    0    0    0
    0    0    0    0   -1    0    0    0
```

```
0   0   0   0   0   2   0   0
0   0   0   0   0   0   1   0
0   0   0   0   0   0   0   -2
```

11) all(x)
ans =
  0
12) any(x)
ans =
  1

Question 2:

a) i = 1, j = 1 ---> A(1,1) = 1
        j = 2 ---> A(1,2) = 0.5000
        j = 3 ---> A(1,3) = 0.3333

i = 2, j = 1 ---> A(2,1) = 0.5000
    j = 2 ---> A(2,2) = 0.3333
    j = 3 ---> A(2,3) = 0.2500

i = 3, j = 1 ---> A(3,1) = 0.3333
    j = 2 ---> A(3,2) = 0.2500
    j = 3 ---> A(3,3) = 0.2000

A =
  1.0000   0.5000   0.3333
  0.5000   0.3333   0.2500
  0.3333   0.2500   0.2000

b)
x =
    0   0.4000   0.8000   1.2000   1.6000 2.0000
length(x) = 6
x(1) = 0 < 1 ---> z(1) = 1
x(2) = 0.4 < 1 ---> z(2) = 1
x(3) = 0.8 < 1 ---> z(3) = 1

x(4) = 1.2 > 1 ---> z(4) = x(4)^2 = 1.2^2 = 1.44
x(5) = 1.6 >1 ---> z(5) = x(5)^2 = 1.4^2 = 2.56
x(6) = 2.0 >1 ---> z(6) = x(6)^2 = 2.0^2 = 4.0

z =
   1.0000   1.0000   1.0000   1.4400   2.5600   4.0000

Question 3:
a) t = 1/3
1) >> format short, t = 0.3333
2) >> format long, t = 0.333333333333333
3) >> format short g,   t = 0.33333
4) >> format bank,   t = 0.33
5) >> floor(t) = 0
6) >> round(t) = 0
7) >> ceil(t) = 1
8) >> fix(t) = 0

b)
```
function quadroots(a, b, c)
% quadroots: roots of quadratic equation
% quadroots(a,b,c): real and complex roots
% of quadratic equation
% input:
% a = second-order coefficient
% b = first-order coefficient
% c = zero-order coefficient
% output:
% r1 = real part of first root
% i1 = imaginary part of first root
% r2 = real part of second root
% i2 = imaginary part of second root
if a == 0
  %special cases
```

```matlab
  if b ~= 0
    %single root
    r1 = -c / b
  else
    %trivial solution
    disp('Trivial solution. Try again')
  end
else
 %quadratic formula
 d = b ^ 2 - 4 * a * c;
 if d >= 0
   %real roots
   r1 = (-b + sqrt(d)) / (2 * a)
   r2 = (-b - sqrt(d)) / (2 * a)
 else
   %complex roots
   r1 = -b / (2 * a)
   i1 = sqrt(abs(d)) / (2 * a)
   r2 = r1
   i2 = -i1
 end
end
```