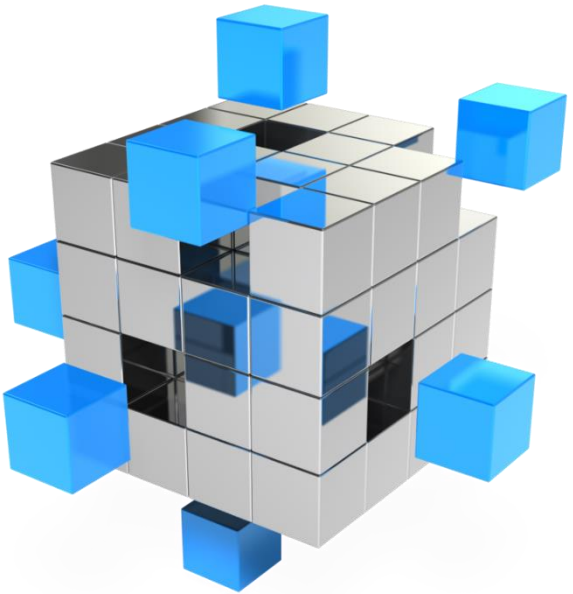
Module 02: Vectors and Matrices



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Given code

```
rvec = [1 2 3 4];
cvec = [5; 6; 7; 8];
```

(a)
```
a = rvec(5)
```

(b)
```
cvec(5) = 10
```

(c)
```
cvec(2:4) = rvec
```

(d)
```
a = [rvec cvec']
```

(e)
```
b = rvec(2:5)
```

M02-Q1: Which of the following scripts have errors?

Given code

```
rvec = [1 2 3 4];
cvec = [5; 6; 7; 8];
```

(a)
```
a = rvec(5)
```

(b)
```
cvec(5) = 10
```

(c)
```
cvec(2:4) = rvec
```

(d)
```
a = [rvec cvec']
```

(e)
```
b = rvec(2:5)
```

- **Answer:** (a), (c), (e)
- **Comment:** Review "Referring to Elements" (p.50, 51), "Modifying Vectors" (p.52, **53**), and "Concatenation" (p.54)

```
rvec = [1 2 3];
col = [5; 6];

mat1 = [rvec; [4, col']]
mat2 = [rvec; [4; col]']
mat3 = [[1;4] [2;5] [3;6]]
mat4 = [1 2; 3 4; 5 6]
```

M02-Q2: Which of a matrix has a different value compared to the other three?

```
rvec = [1 2 3];
col = [5; 6];

mat1 = [rvec; [4, col']]
mat2 = [rvec; [4; col]']
mat3 = [[1;4] [2;5] [3;6]]
mat4 = [1 2; 3 4; 5 6]
```

- **Answer:** mat4
- **Comment:** “Concatenation” (p.54)

```
mat1 = [1 2 3 4; 5 6 7 8];
mat1 = mat1';
mat1(:, 1) = mat1(:,2);
mat1([1 2],:) = mat1([2 1], :);
mat1(:, end) = 10;
```

6	10
5	10
7	10
8	10

(a)

10	10
3	4
5	6
7	8

(b)

10	6
10	15
10	7
10	8

(c)

1	5
2	6
3	7
10	10

(d)

M02-Q3: What value is assigned to *mat1*?

```
mat1 = [1 2 3 4; 5 6 7 8];
mat1 = mat1';
mat1(:, 1) = mat1(:,2);
mat1([1 2],:) = mat1([2 1], :);
mat1(:, end) = 10;
```

★★

6	10
5	10
7	10
8	10

(a)

10	10
3	4
5	6
7	8

(b)

10	6
10	15
10	7
10	8

(c)

1	5
2	6
3	7
10	10

(d)

6	10
5	10
7	10
8	10

- **Answer:** A
- **Comment:** Review “Matrix Elements” (p.57, 58), its example (p. 59), “Modifying Matrices” (p. 60-62).

```
A = [1 2 3];
B = [4;5;6;7];
C = [1 2 3 4; 4 5 6 7; 7 8 9 10];
```

(a)
```
mat1 = C*A;
```

(b)
```
mat2 = C*B;
```

(c)
```
mat3 = B*C;
```

(d)
```
mat4 = A*C;
```

(e)
```
mat5 = A*B;
```

M02-Q4: Which of the following scripts have NO errors?

```
A = [1 2 3];
B = [4;5;6;7];
C = [1 2 3 4; 4 5 6 7; 7 8 9 10];
```

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(a)
```
mat1 = C*A;
```

(b)
```
mat2 = C*B;
```

(c)
```
mat3 = B*C;
```

(d)
```
mat4 = A*C;
```

(e)
```
mat5 = A*B;
```

- **Answer:** (b), (d)
- **Comment:** Review “Matrix Times a Matrix” (p.73), its example (p. 74, 75)

```
mat1 = [1 2 3 4; 5 6 7 8];
rvec = [1 2 3]

mat1 = mat1';
mat1(rvec,:) = 2;
mat1(rvec) = 3;
mat1(end,:) = [];
```

M02-Q5: What is a value at *mat1(4) after executing this script*?

```
mat1 = [1 2 3 4; 5 6 7 8];
rvec = [1 2 3]

mat1 = mat1';
mat1(rvec,:) = 2;
mat1(rvec) = 3;
mat1(end,:) = [];
```

3	2
3	2
3	2

- **Answer:** 2
- **Comment:** Review “Matrix Elements” (p.57, 58), its example (p. 59), “Empty Vectors and Matrices” (p. 66).

```
n = 5;
v1 = (1:n).*(1:n);
v2 = n:-1:1;
v3 = 1:2:n;
vec1 = [v1 v2 v3];
```

(A) [1 2 3 4 5 5 4 3 2 1 1 3 5]

(B) [1 4 6 8 10 5 4 3 2 1 2 4]

(C) [1 4 9 16 25 1 2 3 4 5 2 4]

(D) [1 4 9 16 25 5 4 3 2 1 1 3 5]

M02-Q6: : What is the array finally assigned to *vec1*?

```
n = 5;
v1 = (1:n).*(1:n);
v2 = n:-1:1;
v3 = 1:2:n;
vec1 = [v1 v2 v3];
```

(A) [1 2 3 4 5 5 4 3 2 1 1 3 5]

(B) [1 4 6 8 10 5 4 3 2 1 2 4]

(C) [1 4 9 16 25 1 2 3 4 5 2 4]

(D) [1 4 9 16 25 5 4 3 2 1 1 3 5]

- **Answer:** (D)
- **Comment:** Review “Creating Row Vectors” (p.46), its example (p. 47)

```
v1 = [49 50 49];
v2 = 'CIVE';
v3 = 121;
v4 = [67 73 86 69];
v5 = '121';
```

Dec	Char
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9

Dec	Char
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z

Dec	Char
97	a
98	b
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z

(a)
```
[v2 v5]
```

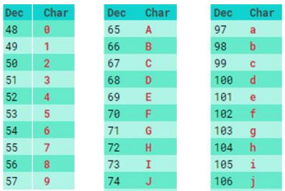
(b)
```
[char(v4) v3]
```

(c)
```
char([v4 v1])
```

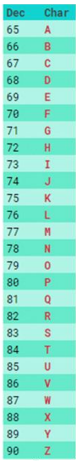
(d)
```
[v2 char(v3)]
```

M02-Q7: Which of the following scripts generating 'CIVE121'?

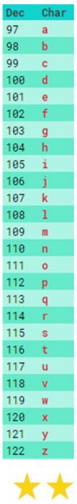
```
v1 = [49 50 49];
v2 = 'CIVE';
v3 = 121;
v4 = [67 73 86 69];
v5 = '121';
```



Dec	Char
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9



Dec	Char
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z



Dec	Char
97	a
98	b
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z

(a) `[v2 v5]`

(b) `[char(v4) v3]`

(c) `char([v4 v1])`

(d) `[v2 char(v3)]`

- **Answer:** (a), (c)
- **Comment:** Review "Character and Character Vector" (p.76), "Character Type Casting" its example (p. 47)

```
char_vec_org = 'ehs';
char_d = double(char_vec_org);
char_d = char_d + [-2 1 3];

char_vec = char(char_d);
char_vec(end+1) = 'e';
```

M02-Q8: Find a character vector assigned to *char_vec*.

```
char_vec_org = 'ehs';
char_d = double(char_vec_org);
char_d = char_d + [-2 1 3];

char_vec = char(char_d);
char_vec(end+1) = 'e';
```

Dec	Char
48	0
49	1
50	2
51	3
52	4
53	5
54	6
55	7
56	8
57	9

Dec	Char
65	A
66	B
67	C
68	D
69	E
70	F
71	G
72	H
73	I
74	J
75	K
76	L
77	M
78	N
79	O
80	P
81	Q
82	R
83	S
84	T
85	U
86	V
87	W
88	X
89	Y
90	Z

Dec	Char
97	a
98	b
99	c
100	d
101	e
102	f
103	g
104	h
105	i
106	j
107	k
108	l
109	m
110	n
111	o
112	p
113	q
114	r
115	s
116	t
117	u
118	v
119	w
120	x
121	y
122	z

- **Answer:** 'cive'
- **Comment:** Review "Character and Character Vector" (p.76), "Character Type Casting" its example (p. 47)