

1. Type in and run the five programs presented in this chapter. Compare the output produced by each program with the output presented after each program in the text.

2. Which of the following are invalid variable names? Why?

[Click here to view code image](#)

✓ Int	char	6_05	alpha_beta_routine
✓ Calloc	Xx	z	AS
✓ floating	_1312	AS	AS
✓ ReInitialize	-	AS	AS

*Invalid keyword*  
*Invalid keyword*  
*Invalid keyword*  
*Invalid keyword*

3. Which of the following are invalid constants? Why?

[Click here to view code image](#)

123.456	1) 0x10.5	2) 0X0G1	1. 21416 12916 12916 12916
0001	0xFFFF	123L	2. 54 16 16 16
0xab05	0L	-597.25	3. 0 16 16 16
123.5e2	.0001	+12	4. 12 16 16 16
98.6F	3) 98.7U	4) 17777s	5. 0 16 16 16
5) 0996x	-12E-12	07777	6. 0 16 16 16
1234uL	6) 1.2Fe-7	9) 15,000x	7. 0 16 16 16
1.234L	197u	100U	
0XABCDEFL	0xabcu	+123	

4. Write a program that converts 27° from degrees Fahrenheit (F) to degrees Celsius (C) using the following formula:

$$C = (F - 32) / 1.8$$

5. What output would you expect from the following program?

```
#include <stdio.h>

int main (void)
{
    char c, d;

    c = 'd';
    d = c;
    printf ("d = %c\n", d);

    return 0;
}
```

6. Write a program to evaluate the polynomial shown here:

$$3x^3 - 5x^2 + 6$$

for  $x = 2.55$ .

7. Write a program that evaluates the following expression and displays the results (remember to use exponential format to display the result):

[Click here to view code image](#)

$$(3.31 \times 10^{-8} \times 2.01 \times 10^{-7}) / (7.16 \times 10^{-6} + 2.01 \times 10^{-8})$$

8. To round off an integer  $i$  to the next largest even multiple of another integer  $j$ , the following formula can be used:

$$\text{Next\_multiple} = i + j - i \% j$$

For example, to round off 256 days to the next largest number of days evenly divisible by a week, values of  $i = 256$  and  $j = 7$  can be substituted into the preceding formula as follows:

[Click here to view code image](#)

$$\begin{aligned} \text{Next\_multiple} &= 256 + 7 - 256 \% 7 \\ &= 256 + 7 - 4 \\ &= 259 \end{aligned}$$

9. Write a program to find the next largest even multiple for the following values of  $i$  and  $j$ :

$i$	$j$
365	7

```
#include <stdio.h>
int main (void)
{
    int    integerVar = 100;
    float  floatingVar = 331.79;
    double doubleVar = 8.44e+11;
    char   charVar = 'W';
    _Bool  boolVar = 0;
    printf ("integerVar = %i\n", integerVar);
    printf ("floatingVar = %f\n", floatingVar);
    printf ("doubleVar = %e\n", doubleVar);
    printf ("doubleVar = %g\n", doubleVar);
    printf ("charVar = %c\n", charVar);
    printf ("boolVar = %i\n", boolVar);
    return 0;
}
```

```
Select C:\Users\STUDENT\Desktop\3333000.exe
integerVar = 100
floatingVar = 331.790009
doubleVar = 8.440000e+011
doubleVar = 8.44e+011
charVar = W
boolVar = 0
Process returned 0 (0x0)   execution time : 0.019 s
Press any key to continue.
```

3.1

```
#include <stdio.h>
int main (void)
{
    int a = 100;
    int b = 2;
    int c = 25;
    int d = 4;
    int result;

    result = a - b;    // subtraction
    printf ("a - b = %i\n", result);

    result = b * c;    // multiplication
    printf ("b * c = %i\n", result);

    result = a / c;    // division
    printf ("a / c = %i\n", result);

    result = a * b * c; // precedence
    printf ("a * b * c = %i\n", result);
    printf ("a * b + c * d = %i\n", a * b + c * d);

    return 0;
}
```

```
C:\Users\STUDENT\Desktop\Untitled1.exe
a - b = 98
b * c = 50
a / c = 4
a * b * c = 1500
a * b + c * d = 300
Process returned 0 (0x0)   execution time : 0.079 s
Press any key to continue.
```

3.2

```
#include <stdio.h>
int main (void)
{
    int    a = 25;
    int    b = 2;
    float  c = 25.0;
    float  d = 2.0;
    printf ("6 + a / 5 * b = %i\n", 6 + a / 5 * b);
    printf ("a / b * b = %i\n", a / b * b);
    printf ("c / d * d = %f\n", c / d * d);
    printf ("-a = %i\n", -a);
    return 0;
}
```

```
C:\Users\STUDENT\Desktop\Untitled1.exe
6 + a / 5 * b = 16
a / b * b = 24
c / d * d = 25.000000
-a = -25
Process returned 0 (0x0)   execution time : 0.016 s
Press any key to continue.
```

3.3

```
#include <stdio.h>
int main (void)
{
    int a = 25, b = 5, c = 10, d = 7;
    printf ("a = %i, b = %i, c = %i, and d = %i\n", a, b,
    c, d);
    printf ("a %% b = %i\n", a % b);
    printf ("a %% c = %i\n", a % c);
    printf ("a %% d = %i\n", a % d);
    printf ("a / d * d + a %% d = %i\n",
    a / d * d + a % d);

    return 0;
}
```

```
D:\6613099\mmkg\Untitled1.exe
a = 25, b = 5, c = 10, and d = 7
a % b = 0
a % c = 5
a % d = 4
a / d * d + a % d = 25
Process returned 0 (0x0)   execution time : 0.030 s
Press any key to continue.
```

3.4

```
#include <stdio.h>
int main (void)
{
    float f1 = 123.125, f2;
    int i1, i2 = -150;
    char c = 'a';

    i1 = f1;    // floating to integer conversion
    printf ("%f assigned to an int produces %i\n", f1, i1);

    f1 = i2;    // integer to floating conversion
    printf ("%i assigned to a float produces %f\n", i2, f1);

    f1 = i2 / 100; // integer divided by integer
    printf ("%i divided by 100 produces %f\n", i2, f1);

    f2 = i2 / 100.0; // integer divided by a float
    printf ("%i divided by 100.0 produces %f\n", i2, f2);

    f2 = (float) i2 / 100; // type cast operator
    printf ("(float) %i divided by 100 produces %f\n", i2, f2);

    return 0;
}
```

```
D:\6613099\mmkg\Untitled1.exe
123.125000 assigned to an int produces 123
-150 assigned to a float produces -150.000000
-150 divided by 100 produces -1.000000
-150 divided by 100.0 produces -1.500000
(float) -150 divided by 100 produces -1.500000
Process returned 0 (0x0)   execution time : 0.015 s
Press any key to continue.
```

3.5

3.5 ✓

2

3

2. Which of the following are invalid variable names? Why?

[Click here to view code image](#)

✓ Int char X 6\_05 X *ตัวขึ้นต้นด้วยตัวเลข*  
✓ Calloc Xx ✓ alpha\_beta\_routine ✓  
✓ floating \_1312 ✓ z ✓  
✓ ReInitialize - X A\$ X *ตัวขึ้นต้นด้วยเครื่องหมายลบ* *ตัวขึ้นต้นด้วย \$*

3. Which of the following are invalid constants? Why?

[Click here to view code image](#)

123.456	1) 0x10.5 X	2) 0X0G1 X	1. ตัวขึ้นต้นด้วย 0 แล้วตามด้วยตัวอักษร
0001	0xFFFF	123L	2. ตัวขึ้นต้นด้วย 0 แล้วตามด้วยตัวอักษร
0Xab05	0L	-597.25	3. ตัวขึ้นต้นด้วย - แล้วตามด้วยตัวอักษร
123.5e2	.0001	+12	4. ตัวขึ้นต้นด้วย + แล้วตามด้วยตัวอักษร
98.6F	3) 98.7U X	4) 17777s X	5. ตัวขึ้นต้นด้วย ตัวอักษร แล้วตามด้วยตัวอักษร
5) 0996 X	-12E-12	07777	6. ตัวขึ้นต้นด้วย 0 แล้วตามด้วยตัวอักษร
1234uL	6) 1.2Fe-7 X	7) 15,000 X	7. ตัวขึ้นต้นด้วย ตัวอักษร แล้วตามด้วยตัวอักษร
1.234L	197u	100U	
0XABCDEFL	0xabcu	+123	

6, 8

6

```
#include <stdio.h>

int main() {
    float x;
    float result;

    x = 2.55;

    result = 3*x*x*x - 5*x*x + 6;

    printf("Result = %.2f\n", result);

    return 0;
}
```

D:\6613099\mmkj\Untitled1.exe

Result = 23.23

Process returned 0 (0x0) execution time : 0.021 s  
Press any key to continue.

8

```
#include <stdio.h>

int main (void)
{
    float f1 = 123.125, f2;
    int i1, i2 = -150;
    char c = 'a';

    i1 = f1; // floating to integer conversion
    printf ("%f assigned to an int produces %i\n", f1, i1);

    f1 = i2; // integer to floating conversion
    printf ("%i assigned to a float produces %f\n", i2, f1);

    f1 = i2 / 100; // integer divided by integer
    printf ("%i divided by 100 produces %f\n", i2, f1);

    f2 = i2 / 100.0; // integer divided by a float
    printf ("%i divided by 100.0 produces %f\n", i2, f2);

    f2 = (float) i2 / 100; // type cast operator
    printf ("(float) %i divided by 100 produces %f\n", i2, f2);

    return 0;
}
```

D:\6613099\mmkj\Untitled1.exe

123.125000 assigned to an int produces 123  
-150 assigned to a float produces -150.000000  
-150 divided by 100 produces -1.000000  
-150 divided by 100.0 produces -1.500000  
(float) -150 divided by 100 produces -1.500000

Process returned 0 (0x0) execution time : 0.015 s  
Press any key to continue.