

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 X     6\_05 X     v4n46180  
✓ Calloc            Xx     alpha\_beta\_routine ✓  
✓ floating        -1312 ✓     z ✓  
ReInitialize      - X     AS X     \$

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

[Click here to view code image](#)

123.456	0x01.5	0X0G1	1. 2016.79683939716
0001	0xFFFF	123L	2. su16 76 613
0Xab05	0L	-597.25	3. 09e+000 0000000000000000
123.5e2	.0001	+12	4. 12. suffix 3 suffix 0000000000000000
98.6F	98.7U X	917777s X	5. 0.5e+314 \$ 0000000000000000
\$0996L	-12E-12	07777	6. 0.5e+314 \$ 0000000000000000
1234uL	1.2Fe-7X	915,000X	7. 0.5e+314 \$ 0000000000000000
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  $x = 2.55$ .

65

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

1.

```
#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 = 98  
 b \* c = 50  
 a / c = 4  
 a \* b \* c = 150  
 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\mmmk\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) i2 divided by 100 produces %f\n", i2, f2);

    return 0;
}
```

■ D:\6613099\mmmk\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

M S J U N G A T T A M ^ 0 3 ✓

2

3

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

[Click here to view code image](#)

		(Invalid keyword)
✓ Int	char X	6_05 X ວິທີກົງເບີຍບວ
✓ Calloc	XX ✓	alpha_beta_routine ✓
✓ floating	_1312 ✓	z ✓
✓ ReInitialize	- X ທີ່ມີລົດລາຍງານ	A\$ X ~ \$

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. ຈົນບໍລິຫານສັບສົນໄດ້
0001	0xFFFF	123L	2. ສູງໃບ ອົງ ດີເລ ໂດ
0Xab05	0L	-597.25	3. ແກ້ໄຂຊັ້ນ ດ້ວຍເນື້ອເຕີມ ອົງນຸ້ມ
123.5e2	.0001	+12	4. ໃຫ້ ສົກລິເຊ ສ ຊຸກສູດເວັດວາໃນ
98.6F	3) 98.7U X	4) 17777s X	5. ອົງ = 2148 ໃນທີ່ກ ລົງວົງ
5) 0996 X	-12E-12	07777	6. ຝົດວ່າ ນຸ້ອົງ
1234uL	6) 1.2Fe-7 X	7) 15,000 X	7. ດີເລກ ຢົນຢັນ ດີເລ ໂດ
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 ("%f(i) %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.