

Chapter 2

2.1 Write a program that uses a single `printf()` to display the following pattern:

```
*   *
  *
*   *
```

```
#include <stdio.h>
int main()
{
    printf("*   *\n *   *\n *\n");
    return 0;
}
```

2.2 Write a program that assigns two negatives values into two integer variables and uses those variables to display the corresponding positives.

```
#include <stdio.h>
int main()
{
    int i, j;

    i = -10;
    j = -20;
    printf("%d %d\n", -i, -j);
    return 0;
}
```

2.3 Fill in the gaps to complete the program in order to display the following output:

```
21
 21
15
25%
A
 a
10
77
077
63
```

C: From Theory to Practice – Unsolved Exercises and Indicative Solutions

```
#include <stdio.h>
int main()
{
    int x = 21, y = 0xa, z = 077;

    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", y);
    printf("_____\\n", y);
    printf("_____\\n", y);
    printf("_____\\n", z);
    printf("_____\\n", z);
    printf("_____\\n", z);
    return 0;
}
```

Answer:

```
#include <stdio.h>
int main()
{
    int x = 21, y = 0xa, z = 077;

    printf("%d\\n", x);
    printf("%3d\\n", x);
    printf("%x\\n", x);
    printf("%o\\n", x);
    printf("%X\\n", y);
    printf("%2x\\n", y);
    printf("%d\\n", y);
    printf("%o\\n", z);
    printf("%#o\\n", z);
    printf("%d\\n", z);
    return 0;
}
```

2.4 Fill in the gaps to complete the program in order to display the following output:

```
-12.123
-12.123456789
  -12.123456789
-12.123457
-12.12346
-12
```

```

#include <stdio.h>
int main()
{
    double x = -12.123456789;

    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", x);
    printf("_____\\n", x);
    return 0;
}

```

Answer:

```

#include <stdio.h>
int main()
{
    double x = -12.123456789;

    printf("%.3f\\n", x);
    printf("%.9f\\n", x);
    printf("%15.9f\\n", x);
    printf("%f\\n", x);
    printf("%.5f\\n", x);
    printf("%.0f\\n", x);
    return 0;
}

```

2.5 Use the flags of `printf()` to fill in the gaps and complete the program, in order to display the following output:

```

x + yj = 2-3j
x - yj = 2+3j
y + xj = -3+2j
y - xj = -3-2j

```

```

#include <stdio.h>
int main()
{
    int x = 2, y = -3;

    printf("x + yj = _____\\n", x, y);
    printf("x - yj = _____\\n", x, -y);
    printf("y + xj = _____\\n", y, x);
    printf("y - xj = _____\\n", y, -x);
}

```

C: From Theory to Practice – Unsolved Exercises and Indicative Solutions

```
        return 0;
    }
```

Answer:

```
#include <stdio.h>
int main()
{
    int x = 2, y = -3;

    printf("x + yj = %d%dj\n", x, y);
    printf("x - yj = %d%+dj\n", x, -y);
    printf("y + xj = %d%+dj\n", y, x);
    printf("y - xj = %d%dj\n", y, -x);
    return 0;
}
```

2.6 Write a program that assigns two positive values into two integer variables and displays the remainder of their division. Use only two variables and don't use the % operator.

```
#include <stdio.h>
int main()
{
    int i, j;

    i = 20;
    j = 15;
    printf("%d\n", i-j*(i/j));
    return 0;
}
```

2.7 Write a program that assigns two positive values into two float variables and displays the integer part of their division and the fractional part. For example, if they are assigned the values 7.2 and 5.4, the program should display 1 and 1.8, since $7.2 = (1 \times 5.4) + 1.8$.

```
#include <stdio.h>
int main()
{
    int i;
    float j, k;

    j = 7.2;
    k = 5.4;
    i = j/k;
    printf("%d %f\n", i, j-(i*k));
}
```

```
        return 0;
    }
```

2.8 Write a program similar to 2.9 (Exercise) for a three-digit positive value.

```
#include <stdio.h>
int main()
{
    int i, h, t, u;

    i = 135;
    h = i/100;
    t = (i-(100*h))/10;
    u = i-(100*h)-(10*t);
    printf("Sum = %d\n", h+t+u);
    return 0;
}
```

