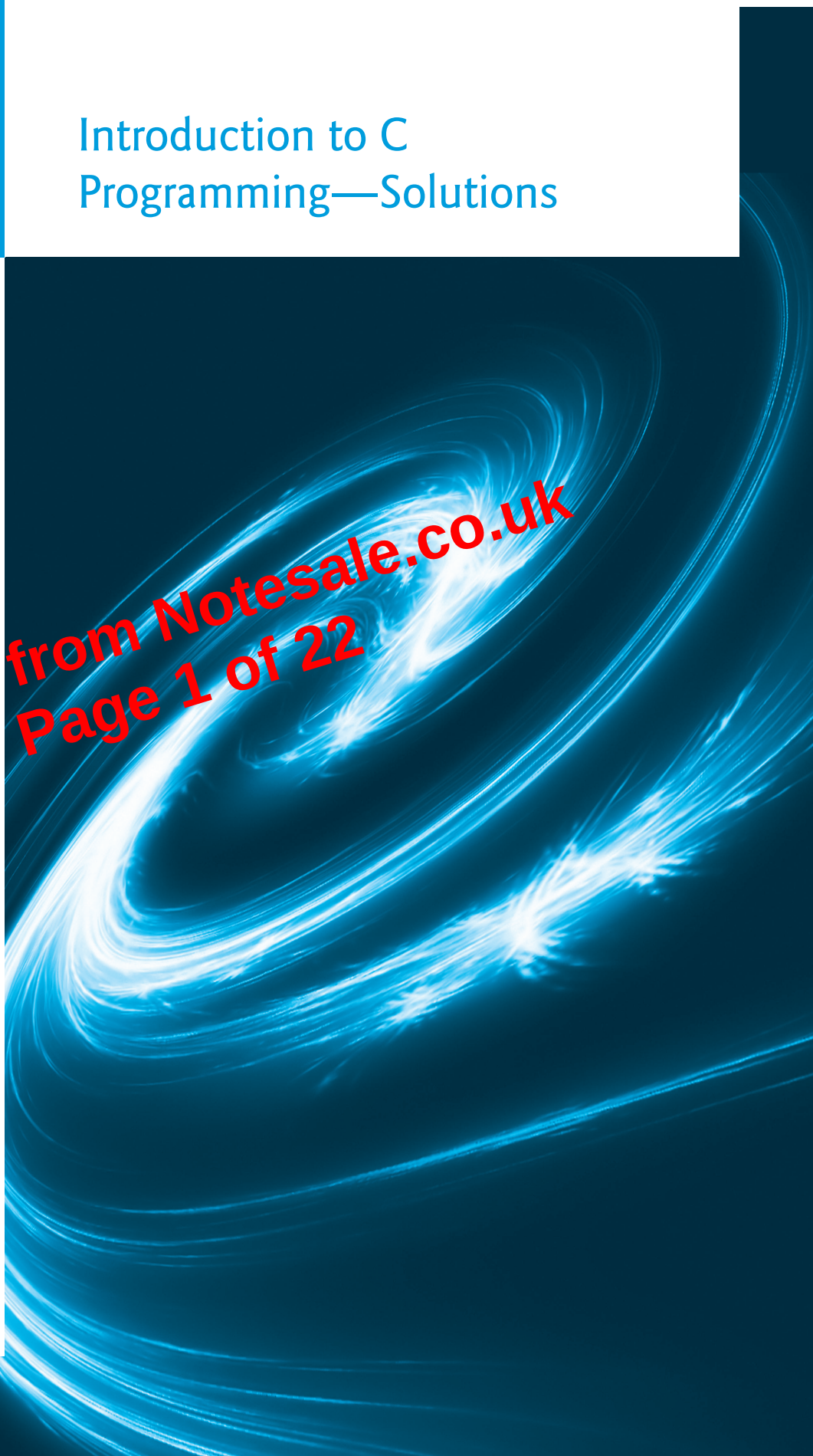
2

Introduction to C Programming—Solutions



What's in a name?
That which we call a rose
By any other name would
smell as sweet.
—William Shakespeare

When faced with a decision, I always ask, "What would be the most fun?"
—Peggy Walker

"Take some more tea," the March Hare said to Alice, very earnestly. "I've had nothing yet," Alice replied in an offended tone: "so I can't take more." "You mean you can't take less," said the Hatter: "it's very easy to take more than nothing."
—Lewis Carroll

High thoughts must have high language.
—Aristophanes

Objectives

In this chapter, you'll:

- Write simple computer programs in C.
- Use simple input and output statements.
- Use the fundamental data types.
- Learn computer memory concepts.
- Use arithmetic operators.
- Learn the precedence of arithmetic operators.
- Write simple decision-making statements.

```
14   } // end main
```

```
1 2 3 4

1 2 3 4

1 2 3 4
```

2.18 Write a program that asks the user to enter two integers, obtains the numbers from the user, then prints the larger number followed by the words "`is larger`." If the numbers are equal, print the message "`These numbers are equal`." Use only the single-selection form of the `if` statement you learned in this chapter.

ANS:

```
1   // Exercise 2.18 Solution
2   #include <stdio.h>
3
4   int main( void )
5   {
6      int x; // define first number
7      int y; // define second number
8
9      printf( "%s", "Enter two numbers: " ); // prompt
10     scanf( "%d%d", &x, &y ); // read two integers
11
12     // compare the two numbers
13     if ( x > y ) {
14        printf( "%d is larger\n", x );
15     } // end if
16
17     if ( x < y ) {
18        printf( "%d is larger\n", y );
19     } // end if
20
21     if ( x == y ) {
22        puts( "These numbers are equal" );
23     } // end if
24  } // end main
```

```
Enter two numbers: 5 20
20 is larger
```

```
Enter two numbers: 239 92
239 is larger
```

```
Enter two numbers: 17 17
These numbers are equal
```

```
#include <stdio.h>

int main( void )
{
   int integer1; // first integer
   int integer2; // second integer

   printf( "%s", "Input two integers: " ); // prompt user
   scanf( "%d%d", &integer1, &integer2 ); // read two integers

   // use remainder operator
   if ( integer1 % integer2 == 0 ) {
      printf( "%d is a multiple of %d\n", integer1, integer2 );
   } // end if

   if ( integer1 % integer2 != 0 ) {
      printf( "%d is not a multiple of %d\n", integer1, integer2 );
   } // end if
} // end main
```

```
Input two integers: 88 11
88 is a multiple of 11
```

```
Input two integers: 777 5
777 is not a multiple of 5
```


2.27 Display the following checkerboard pattern with eight `printf` statements and then display the same pattern with as few `printf` statements as possible.

```
* * * * * * * *
 * * * * * * * *
* * * * * * * *
 * * * * * * * *
* * * * * * * *
 * * * * * * * *
* * * * * * * *
 * * * * * * * *
```

ANS:

```
// Exercise 2.27 Solution
#include <stdio.h>

int main( void )
{
   puts( "With eight printf() statements:" );

   printf(  "%s", "* * * * * * * *\n" );
   printf(  "%s", " * * * * * * * *\n" );
   printf(  "%s", "* * * * * * * *\n" );
   printf(  "%s", " * * * * * * * *\n" );
   printf(  "%s", "* * * * * * * *\n" );
   printf(  "%s", " * * * * * * * *\n" );
```