```c
// Conditions and relational operators

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for x
    int x = get_int("x: ");

    // Prompt user for y
    int y = get_int("y: ");

    // Compare x and y
    if (x < y)
    {
        printf("x is less than y\n");
    }
    else if (x > y)
    {
        printf("x is greater than y\n");
    }
    else
    {
        printf("x is equal to y\n");
    }
}
```

```c
// Opportunity for better design

#include <stdio.h>

int main(void)
{
    printf("cough\n");
    printf("cough\n");
    printf("cough\n");
}
```

```c
// Better design

#include <stdio.h>

int main(void)
{
    for (int i = 0; i < 3; i++)
    {
        printf("cough\n");
    }
}
```

```c
// Abstraction

#include <stdio.h>

void cough(void);

int main(void)
{
    for (int i = 0; i < 3; i++)
    {
        cough();
    }
}

// Cough once
void cough(void)
{
    printf("cough\n");
}
```

```c
// Abstraction with parameterization

#include <stdio.h>

void cough(int n);

int main(void)
{
    cough(3);
}

// Cough some number of times
void cough(int n)
{
    for (int i = 0; i < n; i++)
    {
        printf("cough\n");
    }
}
```

```c
// Floating-point arithmetic

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for x
    float x = get_float("x: ");

    // Prompt user for y
    float y = get_float("y: ");

    // Perform division
    printf("%f divided by %f is %f\n", x, y, x / y);
}
```

```c
// A program

#include <stdio.h>

int main(void)
{
    printf("hello, world\n");
}
```

```c
// Floating-point imprecision

#include <stdio.h>

int main(void)
{
    printf("%.55f\n", 1.0 / 10.0);
}
```

```c
// get_int and printf with %i

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    int i = get_int("integer: ");
    printf("hello, %i\n", i);
}
```

```c
// Integer arithmetic

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for x
    int x = get_int("x: ");

    // Prompt user for y
    int y = get_int("y: ");

    // Perform arithmetic
    printf("%i plus %i is %i\n", x, y, x + y);
    printf("%i minus %i is %i\n", x, y, x - y);
    printf("%i times %i is %i\n", x, y, x * y);
    printf("%i divided by %i is %i\n", x, y, x / y);
    printf("remainder of %i divided by %i is %i\n", x, y, x % y);
}
```

```c
// Logical operators

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for answer
    char c = get_char("answer: ");

    // Check answer
    if (c == 'Y' || c == 'y')
    {
        printf("yes\n");
    }
    else if (c == 'N' || c == 'n')
    {
        printf("no\n");
    }
}
```

```c
// Integer overflow

#include <stdio.h>
#include <unistd.h>

int main(void)
{
    // Iteratively double i
    for (int i = 1; ; i *= 2)
    {
        printf("%i\n", i);
        sleep(1);
    }
}
```

```c
// Remainder operation

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for integer
    int n = get_int("n: ");

    // Check parity of integer
    if (n % 2 == 0)
    {
        printf("even\n");
    }
    else
    {
        printf("odd\n");
    }
}
```

```c
// Abstraction and scope

#include <cs50.h>
#include <stdio.h>

int get_positive_int(string prompt);

int main(void)
{
    int i = get_positive_int("positive integer, please: ");
    printf("%i\n", i);
}

// Prompt user for positive integer
int get_positive_int(string prompt)
{
    int n;
    do
    {
        n = get_int(prompt);
    }
    while (n < 1);
    return n;
}
```

```c
// Return value

#include <cs50.h>
#include <stdio.h>

int square(int n);

int main(void)
{
    int x = get_int("x: ");
    printf("%i\n", square(x));
}

// Return square of n
int square(int n)
{
    return n * n;
}
```

```c
// Conditions and relational operators

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for number
    int i = get_int("number: ");

    // Check sign of number
    if (i < 0)
    {
        printf("negative\n");
    }
    else if (i > 0)
    {
        printf("positive\n");
    }
    else
    {
        printf("zero\n");
    }
}
```

```c
// Sizes of types

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Print sizes
    printf("bool is %lu\n", sizeof(bool));
    printf("char is %lu\n", sizeof(char));
    printf("double is %lu\n", sizeof(double));
    printf("float is %lu\n", sizeof(float));
    printf("int is %lu\n", sizeof(int));
    printf("long is %lu\n", sizeof(long));
    printf("string is %lu\n", sizeof(string));
}
```

```c
// get_string and printf with %s

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    string s = get_string("name: ");
    printf("hello, %s\n", s);
}
```

```c
// switch

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    // Prompt user for answer
    char c = get_char("answer: ");

    // Check answer
    switch (c)
    {
        case 'Y':
        case 'y':
            printf("yes\n");
            break;
        case 'N':
        case 'n':
            printf("no\n");
            break;
    }
}
```

```c
// Floating-point arithmetic

#include <cs50.h>
#include <stdio.h>

int main(void)
{
    float f = get_float("F: ");
    float c = 5.0 / 9.0 * (f - 32.0);
    printf("C: %.1f\n", c);
}
```