

```
1 // Conditions and relational operators
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for x
9     int x = get_int("x: ");
10
11     // Prompt user for y
12     int y = get_int("y: ");
13
14     // Compare x and y
15     if (x < y)
16     {
17         printf("x is less than y\n");
18     }
19     else if (x > y)
20     {
21         printf("x is greater than y\n");
22     }
23     else
24     {
25         printf("x is equal to y\n");
26     }
27 }
```

```
1  // Opportunity for better design
2
3  #include <stdio.h>
4
5  int main(void)
6  {
7      printf("cough\n");
8      printf("cough\n");
9      printf("cough\n");
10 }
```

```
1  // Better design
2
3  #include <stdio.h>
4
5  int main(void)
6  {
7      for (int i = 0; i < 3; i++)
8      {
9          printf("cough\n");
10     }
11 }
```

```
1  // Abstraction
2
3  #include <stdio.h>
4
5  void cough(void);
6
7  int main(void)
8  {
9      for (int i = 0; i < 3; i++)
10     {
11         cough();
12     }
13 }
14
15 // Cough once
16 void cough(void)
17 {
18     printf("cough\n");
19 }
```

```
1  // Abstraction with parameterization
2
3  #include <stdio.h>
4
5  void cough(int n);
6
7  int main(void)
8  {
9      cough(3);
10 }
11
12 // Cough some number of times
13 void cough(int n)
14 {
15     for (int i = 0; i < n; i++)
16     {
17         printf("cough\n");
18     }
19 }
```

```
1 // Floating-point arithmetic
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for x
9     printf("x is ");
10    float x = get_float();
11
12    // Prompt user for y
13    printf("y is ");
14    float y = get_float();
15
16    // Perform division
17    printf("%f divided by %f is %f\n", x, y, x / y);
18 }
```

```
1  // A program
2
3  #include <stdio.h>
4
5  int main(void)
6  {
7      printf("hello, world\n");
8  }
```

```
1 // Floating-point imprecision
2
3 #include <stdio.h>
4
5 int main(void)
6 {
7     printf("%.55f\n", 1.0 / 10.0);
8 }
```

```
1 // get_int and printf with %i
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     int i = get_int("integer: ");
9     printf("hello, %i\n", i);
10 }
```

```
1 // Integer arithmetic
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for x
9     int x = get_int("x: ");
10
11     // Prompt user for y
12     int y = get_int("y: ");
13
14     // Perform arithmetic
15     printf("%i plus %i is %i\n", x, y, x + y);
16     printf("%i minus %i is %i\n", x, y, x - y);
17     printf("%i times %i is %i\n", x, y, x * y);
18     printf("%i divided by %i is %i\n", x, y, x / y);
19     printf("remainder of %i divided by %i is %i\n", x, y, x % y);
20 }
```

```
1  // Logical operators
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int main(void)
7  {
8      // Prompt user for answer
9      char c = get_char("answer: ");
10
11     // Check answer
12     if (c == 'Y' || c == 'y')
13     {
14         printf("yes\n");
15     }
16     else if (c == 'N' || c == 'n')
17     {
18         printf("no\n");
19     }
20 }
```

```
1  // Integer overflow
2
3  #include <stdio.h>
4  #include <unistd.h>
5
6  int main(void)
7  {
8      // Iteratively double i
9      for (int i = 1; ; i *= 2)
10     {
11         printf("%i\n", i);
12         sleep(1);
13     }
14 }
```

```
1  // Remainder operation
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int main(void)
7  {
8      // Prompt user for integer
9      int n = get_int("n: ");
10
11     // Check parity of integer
12     if (n % 2 == 0)
13     {
14         printf("even\n");
15     }
16     else
17     {
18         printf("odd\n");
19     }
20 }
```

```
1  // Abstraction and scope
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int get_positive_int(string prompt);
7
8  int main(void)
9  {
10     int i = get_positive_int("positive integer, please: ");
11     printf("%i\n", i);
12 }
13
14 // Prompt user for positive integer
15 int get_positive_int(string prompt)
16 {
17     int n;
18     do
19     {
20         n = get_int(prompt);
21     }
22     while (n < 1);
23     return n;
24 }
```

```
1  // Return value
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int square(int n);
7
8  int main(void)
9  {
10     printf("x: ");
11     int x = get_int();
12     printf("%i\n", square(x));
13 }
14
15 // Return square of n
16 int square(int n)
17 {
18     return n * n;
19 }
```

```
1  // Conditions and relational operators
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int main(void)
7  {
8      // Prompt user for number
9      int i = get_int("number: ");
10
11     // Check sign of number
12     if (i < 0)
13     {
14         printf("negative\n");
15     }
16     else if (i > 0)
17     {
18         printf("positive\n");
19     }
20     else
21     {
22         printf("zero\n");
23     }
24 }
```



```
1 // Sizes of types
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Print sizes as unsigned longs
9     printf("bool is %lu\n", sizeof(bool));
10    printf("char is %lu\n", sizeof(char));
11    printf("double is %lu\n", sizeof(double));
12    printf("float is %lu\n", sizeof(float));
13    printf("int is %lu\n", sizeof(int));
14    printf("long long is %lu\n", sizeof(long long));
15    printf("string is %lu\n", sizeof(string));
16 }
```

```
1 // get_string and printf with %s
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     string s = get_string("name: ");
9     printf("hello, %s\n", s);
10 }
```

```
1  // switch
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int main(void)
7  {
8      // Prompt user for answer
9      char c = get_char("answer: ");
10
11     // Check answer
12     switch (c)
13     {
14         case 'Y':
15         case 'y':
16             printf("yes\n");
17             break;
18         case 'N':
19         case 'n':
20             printf("no\n");
21             break;
22     }
23 }
```

```
1  // Floating-point arithmetic
2
3  #include <cs50.h>
4  #include <stdio.h>
5
6  int main(void)
7  {
8      float f = get_float("F: ");
9      float c = 5.0 / 9.0 * (f - 32.0);
10     printf("C: %.1f\n", c);
11 }
```