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

```
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("What's your name? ");
9     printf("hello, %s\n", s);
10 }
```

```
1 // Addition with int
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 addition
15     printf("%i\n", x + y);
16 }
```

```
1 // Addition with long
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for x
9     long x = get_long("x: ");
10
11     // Prompt user for y
12     long y = get_long("y: ");
13
14     // Perform addition
15     printf("%ld\n", x + y);
16 }
```

```
1 // Division with integers, demonstrating truncation
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     // Divide x by y
15     float z = x / y;
16
17     // Perform division
18     printf("%f\n", z);
19 }
```

```
1 // Conditionals, Boolean expressions, relational operators
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for points
9     int points = get_int("How many points did you lose? ");
10
11     // Compare points against mine
12     if (points < 2)
13     {
14         printf("You lost fewer points than me.\n");
15     }
16     else if (points > 2)
17     {
18         printf("You lost more points than me.\n");
19     }
20     else if (points == 2)
21     {
22         printf("You lost the same number of points as me.\n");
23     }
24 }
```

```
1 // Design
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for points
9     int points = get_int("How many points did you lose? ");
10
11     // Compare points against mine
12     if (points < 2)
13     {
14         printf("You lost fewer points than me.\n");
15     }
16     else if (points > 2)
17     {
18         printf("You lost more points than me.\n");
19     }
20     else
21     {
22         printf("You lost the same number of points as me.\n");
23     }
24 }
```

```
1 // Constants
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Number of points that I lost
9     const int MINE = 2;
10
11     // Prompt user for points
12     int points = get_int("How many points did you lose? ");
13
14     // Compare points against mine
15     if (points < MINE)
16     {
17         printf("You lost fewer points than me.\n");
18     }
19     else if (points > MINE)
20     {
21         printf("You lost more points than me.\n");
22     }
23     else
24     {
25         printf("You lost the same number of points as me.\n");
26     }
27 }
```



```
1 // Calculates a remainder
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 // Logical operators
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user to agree
9     char c = get_char("Do you agree? ");
10
11     // Check whether agreed
12     if (c == 'Y' || c == 'y')
13     {
14         printf("Agreed.\n");
15     }
16     else if (c == 'N' || c == 'n')
17     {
18         printf("Not agreed.\n");
19     }
20 }
```

```
1 // Opportunity for better design
2
3 #include <stdio.h>
4
5 int main(void)
6 {
7     printf("meow\n");
8     printf("meow\n");
9     printf("meow\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("meow\n");
10    }
11 }
```

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

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

```
1 // No return value
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     float regular = get_float("Regular Price: ");
9     float sale = regular * .85;
10    printf("Sale Price: %.2f\n", sale);
11 }
```

```
1 // Return value
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 float discount(float price);
7
8 int main(void)
9 {
10     float regular = get_float("Regular Price: ");
11     float sale = discount(regular);
12     printf("Sale Price: %.2f\n", sale);
13 }
14
15 // Discount price
16 float discount(float price)
17 {
18     return price * .85;
19 }
```



```
1 // Floating-point imprecision
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for x
9     float x = get_float("x: ");
10
11     // Prompt user for y
12     float y = get_float("y: ");
13
14     // Divide x by y
15     float z = x / y;
16
17     // Perform division
18     printf("%.50f\n", z);
19 }
```

```
1 // Truncation
2
3 #include <cs50.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     // Prompt user for x
9     long x = get_long("x: ");
10
11     // Prompt user for y
12     long y = get_long("y: ");
13
14     // Divide x by y
15     float z = x / y;
16
17     // Perform division
18     printf("%f\n", z);
19 }
```

```
1 // Libraries (e.g., rounding with 4.20)
2
3 #include <cs50.h>
4 #include <math.h>
5 #include <stdio.h>
6
7 int main(void)
8 {
9     float amount = get_float("Dollar Amount: ");
10    int pennies = round(amount * 100);
11    printf("Pennies: %i\n", pennies);
12 }
```

```
1 // Animation
2
3 #include <stdio.h>
4 #include <unistd.h>
5
6 int main(void)
7 {
8     printf("🎈");
9     for (int i = 0; i < 50; i++)
10    {
11        printf("\n");
12        sleep(1);
13    }
14 }
```

```
1 // Counting
2
3 #include <stdbool.h>
4 #include <stdio.h>
5
6 int main(void)
7 {
8     int i = 0;
9     while (true)
10    {
11        printf("\r%i", i);
12        i++;
13    }
14 }
```

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

```
1 // Math library
2
3 #include <cs50.h>
4 #include <math.h>
5 #include <stdio.h>
6
7 int main(void)
8 {
9     double base = get_double("Base: ");
10    double exponent = get_double("Exponent: ");
11    printf("Output: %.0f\n", pow(base, exponent));
12 }
```