cc-practice-io

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1. scanf

1.1. Scan integer and floating-point input

1. Use the code block 1 below for practice
2. Define two *integer* variables `k`, `l`, and two *floating-point* variables `u` and `v`
3. Complete the `scanf` *format string* and enter the variables list to scan these variables

4. Run the code block 1 below to generate an input file `scanf_input` (the input should **not** contain the `f` character).

```
echo "100 -1000 .456 -9.34e2" > scanf_input
cat scanf_input
```

5. Run the code block 1 to get the output:

```
: |  100|-1000|0.456| -934|
```

```
// declare variables
...

// scan input
scanf("...", ...);

// print scanned input
printf("|...|...|...|...|\n", ...);
```

—— SOLUTION ——

```
// declare variables
int k, l;
float u, v;

// scan input
scanf("%d%d%f%f", &k, &l, &u, &v);

// print scanned input
printf("|%5d|%5d|%5.3f|%5.f|\n", k, l, u, v);
```

```
|  100|-1000|0.456| -934|
```

1.2. Scanning ordinary characters

1. Run the C code block below with two input files, `ord1` and `ord2`.
2. Create the input files here:
   - the input file `ord1` contains `•5/•96` and should succeed
   - the input file `ord2` contains `•5 /•96` and should fail

   Create input file `ord1`:

   ```
   echo "..." > ord1
   ```

   Create input file `ord2`:

   ```
   echo "..." > ord2
   ```

3. Run program the program twice:
   - `ord1` as input file
   - `ord2` as input file

   Change the `#+name` of the program accordingly so that you can see both outputs next to each other (from `pgm:ordTest1` to `pgm:ordTest2`).

```
int i,j;

scanf("%d/%d", &i, &j);

printf("|%5d|%5d|\n", i, j);
```

—— SOLUTION ——

```
echo " 5/ 96" > ./data/ord1
```

```
echo " 5 / 96" > ./data/ord2
```

```
int i,j;

scanf("%d/%d", &i, &j);

printf("|%5d|%5d|\n", i, j);
```

```
|    5|   96|
```

```
int i,j;

scanf("%d/%d", &i, &j);

printf("|%5d|%5d|\n", i, j);
```

```
|    5|    0|
```

1.3. Match input patterns exactly

1. Run the code 1 below. It creates an input file `numbers` that contains: `444==++//555`

   ```
   echo "444==++//555" > numbers
   cat numbers
   ```

2. Complete the code 1 below to pick up only the numbers in the input file.

   ```
   int foo, bar;

   scanf(...)
   printf("%d %d", foo,  bar);
   ```

   —— SOLUTION ——

   ```
   int foo, bar;

   scanf("%d==++//%d", &foo, &bar);
   printf("%d %d", foo,  bar);
   ```

   ```
   444 555
   ```

1.4. Add fractions

1. The program 1 prompts the user to add two fractions and then display their sum.

   Sample output for the input 5/6 and 3/4:

   ```
   5/6 + 3/4 = 38/24
   ```

2. Run the code block 1 to create the input file with the sample numbers.

   ```
   echo "5/6" > addFrac_input
   echo "3/4" >> addFrac_input
   cat addFrac_input
   ```

3. Complete the format strings below so that the program runs as intended!

```
// declare variables
int num1, denom1, num2, denom2, result_num, result_denom;

// scan input
scanf("...", &num1, &denom1);
scanf("...", &num2, &denom2);

// compute numerator and denominator
result_num = num1 * denom2 + num2 *denom1;
result_denom = denom1 * denom2;

// print result
printf("%d/%d + %d/%d = %d/%d\n",
       num1, denom1, num2, denom2,
       result_num, result_denom);
```

1. Modify the program 1 so that there is only **on** `scanf` statement. Make sure that the modified program yields the same result as before.

—— SOLUTION ——

```c
// declare variables
int num1, denom1, num2, denom2, result_num, result_denom;

// scan input
scanf("%d/%d", &num1, &denom1);
scanf("%d/%d", &num2, &denom2);

// compute numerator and denominator
result_num = num1 * denom2 + num2 *denom1;
result_denom = denom1 * denom2;

// print result
printf("%d/%d + %d/%d = %d/%d\n",
       num1, denom1, num2, denom2,
       result_num, result_denom);
```

```
5/6 + 3/4 = 38/24
```

```
5/6 + 3/4 = 38/24
```

```
// declare variables
int num1, denom1, num2, denom2, result_num, result_denom;

// scan input
scanf("%d/%d%d/%d",
      &num1, &denom1, &num2, &denom2);

// compute numerator and denominator
result_num = num1 * denom2 + num2 *denom1;
result_denom = denom1 * denom2;

// print result
printf("%d/%d + %d/%d = %d/%d\n",
       num1, denom1, num2, denom2,
       result_num, result_denom);
```

```
5/6 + 3/4 = 38/24
```

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