

# Review of the C Language

## CISC 3350 — CUNY Brooklyn College

### Lecture Notes



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# Review of the C Language

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These lecture notes contain the full code of several C programs, each of which introduces us to a different aspect of the C language, necessary to understand Linux programming aspects that we cover in future topics of the course. Each program includes comments that explain in detail how lines of code in the program work.

You can (and are encouraged!) to compile and run these programs in your own Linux account, which can be done as follows:

1. Log into your Brooklyn College Student Linux account (see this guide: <https://forms.gle/HU7Kmgghf79WPf9xB9>.)
2. In a directory of your choice, download the C source code of a program using wget, for example:

```
$ wget https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/lecture_notes/topic_03/helloworld.c
```

3. Compile the program:

```
$ gcc -Wall -Wextra -O2 -g -o helloworld helloworld.c
```

4. And, finally, run it:

```
$ ./helloworld
```



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1. The code of the program [helloworld.c](#):

```
1  /* Simple C program to display "Hello, World!"
2   *
3   *   Miriam Briskman, 1/6/2024
4   *   CISC 3350, Brooklyn College
5   *   Licensed under CC BY-NC 4.0
6   */
7
8  // A one-line C comment starts with: //
9  // Just like this line and the line above!
10
11 // A multiline C comment starts with /*
12 //    and ends with */ like:
```



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2. The code of the program [variables.c](#):

```
1  /* C program showing how to work with variables,  
2   *   constants, assignments and basic math,  
3   *   and printf statements.  
4   *  
5   *   Miriam Briskman, 2/15/2023  
6   *   CISC 3350, Brooklyn College  
7   *   Licensed under CC BY-NC 4.0  
8   */  
9  
10 // Include a reference to C's standard input and  
11 //   output library:  
12 #include <stdio.h>
```



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3. The code of the program [conditions.c](#):

```
1  /* A C program that shows how condition
2  *    statements (if, if-else, if-else-if,
3  *    and switch) work.
4  *
5  *    Miriam Briskman, 2/8/2023
6  *    CISC 3350, Brooklyn College
7  *    Licensed under CC BY-NC 4.0
8  */
9
10 #include <stdio.h>
11 #include <stdlib.h>
12
```



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4. The code of the program [loops.c](#):

```
1  /* A C program that works with for, while,  
2   *   and do-while loops.  
3   *  
4   *   Miriam Briskman, 2/8/2023  
5   *   CISC 3350, Brooklyn College  
6   *   Licensed under CC BY-NC 4.0  
7   */  
8  
9  #include <stdio.h>  
10 #include <stdlib.h>  
11  
12 int main ()
```



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5. The code of the program [char arrays and pointers.c](#):

```
1  /* A C program demonstrating the use of arrays
2   *    of characters, a.k.a. C-strings!
3   *
4   *    Miriam Briskman, 2/15/2023
5   *    CISC 3350, Brooklyn College
6   *    Licensed under CC BY-NC 4.0
7   */
8
9  #include <stdio.h>
10 #include <stdlib.h>
11 // A string library: strlen(), strcmp() ...
12 #include <string.h>
```



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6. The code of the program [files.c](#):

```
1  /* C program that reads from and writes to files.
2   *
3   *    Miriam Briskman, 2/8/2023
4   *    CISC 3350, Brooklyn College
5   *    Licensed under CC BY-NC 4.0
6   */
7
8  #include <stdio.h>
9  #include <stdlib.h>
10
11 // Constant storing array size:
12 const int ARR_SIZE = 400;
```



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7. The code of the program [functions.c](#):

```
1  /* A C program that declares and defines functions
2     *   of various types and calls them inside main().
3     *
4     *   Miriam Briskman, 2/22/2023
5     *   CISC 3350, Brooklyn College
6     *   Licensed under CC BY-NC 4.0
7     */
8
9  #include <stdio.h>
10 #include <stdlib.h>
11 #include <string.h> // The string library of C
12
```



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8. The code of the program [structs.c](#):

```
1  /* A C program introducing C structs (structures).
2   *
3   *   Miriam Briskman, 2/8/2023
4   *   CISC 3350, Brooklyn College
5   *   Licensed under CC BY-NC 4.0
6   */
7
8  #include <stdio.h>
9  #include <stdlib.h>
10 #include <string.h> // String library
11
12 // C's 'objects':
```



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9. The code of the program [error\\_checking.c](#):

```
1  /* This program reminds us that errors must be
2   *   checked after a user entered some input:
3   *   we shouldn't depend on the user's
4   *   attention to detail and integrity when
5   *   requesting data from the user. Whether
6   *   the user makes a mistake and enters an
7   *   incorrect datum, or if they do so
8   *   intentionally, our program must be
9   *   capable of detecting it and, possibly,
10  *   asking the user to re-enter data.
11  *
12  *   Miriam Briskman, 2/8/2023
```



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10. The code of the program [command line arguments.c](#):

```
1  /* This program shows how to work with command-line
2   *   arguments. So far, we haven't touched this
3   *   aspect of C-programming, but, as we will
4   *   learn later in this course, command-line
5   *   arguments turn out to be super useful and
6   *   convenient to use!
7   *
8   *   Miriam Briskman, 2/8/2023
9   *   CISC 3350, Brooklyn College
10  *   Licensed under CC BY-NC 4.0
11  */
12
```



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For PDF copies of all these programs' full, color-coded code, you may access the following copies of the programs in our course packet using the following direct links:

1. helloworld.c:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#helloworld.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#helloworld.c)

2. variables.c:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#variables.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#variables.c)

3. conditions.c:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#conditions.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#conditions.c)

4. loops.c:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#loops.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#loops.c)

5. char\_arrays\_and\_pointers.c:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#char\\_arrays\\_and\\_pointers.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#char_arrays_and_pointers.c)



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6. `files.c`:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#files.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#files.c)

7. `functions.c`:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#functions.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#functions.c)

8. `structs.c`:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#structs.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#structs.c)

9. `error_checking.c`:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#error\\_checking.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#error_checking.c)

10. `command_line_arguments.c`:

[https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#command\\_line\\_arguments.c](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#command_line_arguments.c)

**Fun fact:** You can access the PDF of any program in our course inside the packet by appending the source code file's name to the URL: `https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#`



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Any questions?



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# Review of the C Language: Sources

Topic 3: Review of the C Language. Briskman, Miriam. *CISC 3350 OER Course Packet*. 2024, [CC BY-NC 4.0](#).

URL: [https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC\\_3350\\_OER\\_Course\\_Packet.pdf#topic+3:+review+of+the+c+language](https://www.sci.brooklyn.cuny.edu/~briskman/cisc/3350/CISC_3350_OER_Course_Packet.pdf#topic+3:+review+of+the+c+language).

Partly based on the teaching of Professor **Yongqing Xiang** of Brooklyn College.



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