Switch, case, break

CSC100 Introduction to programming in C/C++

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1 README

- [X] Work through this notebook at your own pace. When you're done, check a task off by typing `C-c C-c` on the line with the `[ ]`. Check this task off for practice! You can close bullet points with the `<TAB>` key on your keyboard
- [X]

  Make sure that you can run C where you are by executing the code block below (`C-c C-c`) and then saving the file (`C-x C-s`)

  ```
  puts("hello world");
  ```

- [X] If this does not lead to the output `hello world`, try to analyze the problem by yourself first. Typical sources of errors:
  - Can you write to the directory?
  - Is this file an Org-file?
  - Did you use the correct key sequence?
  - Do you have the right code block header arguments?
- This section follows the exercises in chapter 5 in King (2008).

2 Switch output example

- [ ]

  What output does the following switch program fragment produce if `i=1`?

  % is the modulo operator - i%j returns the remainder of i/j. E.g. 5 % 4 = 4/4 + 1 = 1, and 3 % 4 = 3 $\frac{1}{4}$.

  Guess the answer first, then replace the ? by 1 and run the block.

  ```
  int i = 1;
  switch ( i % 3 ) {
   case 0: printf("zero");
   case 1: printf("one");
   case 2: printf("two");
   }
  ```

```
onetwo
```

- [ ]

  Fix the code in 1 so that the output for i=1,2, or 3 is "one", "two", or "three".

```
int i = 1;
switch ( i % 3 ) {
 case 0: printf("zero");
   break;
 case 1: printf("one");
   break;
 case 2: printf("two");
   break;
 }
```

```
one
```

3 Write a switch statement

- The following table shows a few of the telephone area codes in GA along with the largest city in the area.

AREA CODE	MAJOR CITY
229	Albany
404	Atlanta
470	Atlanta
478	Macon
678	Atlanta
912	Savannah

- [ ]

  Write a `switch` statement whose controlling expression is the variable `area_code` - if the value of `area_code` is in the table, the `switch` statement should print the corresponding city name. Otherwise, it should print the message "Area code not recognized".

  In the code block 1, the variables and input statements have already been written for you, and the switch statement has been started - all you need to do is complete the `switch` statement.

  Tip: to save space, you can place `case` labels leading to the same statement on one line.

```c
int area_code;

scanf("%d", &area_code);

switch (area_code) {
 case 404: case 470: case 678:
   printf("Atlanta");
   break;
```

```
  case 229:
    printf("Albany");
    break;
  case 478: printf("Macon");
    break;
  default:
    printf("Area code not recognized");
    break;
  }
```

```
Albany
```

- [ ]

  Run and test the file right here with the input file areacode. The following code block initializes the file with 229 - replace it and run the block to try other input numbers.

  ```
  echo 229 > areacode
  ```

- [ ]

  Bonus question: why did we define `area_code` as a integer even though you don't perform arithmetic operations with area codes?

  > Answer: the case label cannot be a character. Only numerical expressions are allowed.

4 References

- Davenport/Vine (2015) C Programming for the Absolute Beginner (3ed). Cengage Learning.
- Kernighan/Ritchie (1978). The C Programming Language (1st). Prentice Hall.
- King (2008). C Programming - A modern approach (2e). W A Norton.
- Orgmode.org (n.d.). 16 Working with Source Code [website]. URL: orgmode.org

Footnotes:

[1] If this puzzles you: to find 3%4, we first find the highest multiple of the divisor (4) that is equal or less than the dividend (3) - this is 0. Then we subtract the highest multiple from the dividend to get the answer: 3 - 0 = 3.

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