Phone number conversion with `scanf`

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Pgm 4: Phone number conversion

Tip

For this exercise, you're first supposed to enter a number like `(870) 456-7890` and get in return an output like `870.456.7890`.

In the second program you enter a number like `870\456\7890` and you get in return an output like `(870) 456-7890`.

If you do this in Org-mode (like we've done it in class) is to put the number into a file, e.g. named `input` and then pass the number to the `scanf` command using the header `:cmdline < input`. A code block should look like this (the `scanf` command is only an example):

```
#+begin_src C :cmdline < input
  int i;
  scanf("%d%", &i)
#+end_src
```

In addition, you need the following line at the top of your file:

```
#+property: header-args:C :main yes :includes <stdio.h>
```

The first file should *tangle* as `phone1.c`, the second should *tangle* as `phone2.c`. To do this in Org-mode, as we've done in class, you need to add `:tangle phone1.c` to one, and `:tangle phone2.c` to the other code block.

When you tangle the whole file with `M-x org-babel-tangle` or (alternatively) `C-c C-v t`, the two C source files would be created.

Problem

- Write a program that prompts the user to enter a telephone number in the form `(xxx) xxx-xxxx`, and then displays the number in the form `xxx.xxx.xxxx`.

- Example input/output of the first program, `phone1.c`:

  ```
  Enter phone number [(xxx) xxx-xxxx]: (870) 456-7890
  You entered: 870.456.7890
  ```

- Write another program that asks for the input format in the form `xxx\xxx\xxxx`, and then displays the number in the form `(xxx)xxx-xxx`.

- Example input/output of the second program, `phone2.c`:

  ```
  Enter phone number [xxx\xxx\xxxx]: 870\456\7890
  You entered: (870) 456-7890
  ```

- Submit one Emacs Org-mode file `phone.org` with both programs in it as code blocks that can be **tangled** as `phone1.c` and `phone2.c`, resp.

- The header information of your Org-mode file should look like this:

  ```
  #+TITLE: Phone number conversion
  #+AUTHOR: [your name]
  #+HONOR: pledged
  #+PROPERTY: header-args:C :main yes :includes <stdio.h> :results output
  ```

- Tip: some characters, like \ are protected because they are part of the file `PATH`. If you want to use them, you have to "escape" them with an extra \, like the newline character `\n`. So to print (or to scan) the character \, you use \\.

Solution

- To run the first program, I took the input number from `input1`:

  ```
  echo "(501) 422-4725" > input1
  cat input1
  ```

- Program 1

  ```
  int area, prefix, suffix;
  printf("Enter phone number [(xxx) xxx-xxxx]:\n");
  scanf("(%d) %d-%d", &area, &prefix, &suffix);
  printf("You entered: %d.%d.%d\n", area, prefix, suffix);
  ```

```
Enter phone number [(xxx) xxx-xxxx]:
You entered: 501.422.4725
```

- To run the second program, I took the input number from `input2`:

```
echo "501\422\4275" > input2
cat input2
```

- Program 2: the \ character has to be escaped as \\.

```
int area, prefix, suffix;
printf("Enter phone number [xxx\\xxx\\xxxx]:\n");
scanf("%d\\%d\\%d", &area, &prefix, &suffix);
printf("You entered: (%d) %d-%d\n", area, prefix, suffix);
```

```
Enter phone number [xxx\xxx\xxxx]:
You entered: (501) 422-4275
```