Regular Expression Example

The following script uses regular expressions to verify and echo (usually in a different format) the user's

- name,
- phone number, and
- Social Security number.

The initial prompt message for each of these values appears in the dialog as

> Enter your … in the format
> …

Here the first "…" is either

> name,
> phone number, or
> Social Security number

The second "…" is filled, respectively, by

> First_name, Last_name,
> (999) 999-9999, or
> 999-99-9999

In all three cases, the string filling the second "…" in the prompt message is also used as the default value for the prompt.

If the user fails to enter a value in the proper format, (s)he is prompted again for that value.

Here the prompt message has the form

> Re-enter your …, this time in the format
> …

The "…"s are filled in as before, and the defaults are as before.

We factor out the strings that are common to these prompts.

We use the following variable initializations:

```
newPrefix =    "Enter your ",
newSuffix =    " in the format\n",
repeatPrefix = "Re-enter your ",
repeatSuffix = ", this time in the format\n";
```

Before each `do/while` loop that invokes the `prompt()` method, we set the variable `firstTime` to `true`.

Within the loop, we set `firstTime` to `false`.

So this `firstTime` is `true` only when the user is prompted for the given value for the first time.

The first line of a prompt message, then, is produced by a conditional expression of the form

```
firstTime
   ? newPrefix + "…" + newSuffix
   : repeatPrefix + "…" + repeatSuffix
```

where the "…"s are filled by "name", "phone number", or "Social Security number".

The general form of the condition of the `do/while` loop is

`!` *str*`.match(` *regexp* `)`

where

- *str* is the variable containing the string returned by `prompt()` and
- *regexp* is the regular expression determining the correct format for the value in *str*.

As an example, the loop for inputting the user's name is:

```
do  {
  name = window.prompt(
            ( firstTime
                ? newPrefix + "name"
                  + newSuffix
                : repeatPrefix + "name"
                  + repeatSuffix )
             + "Last_name, First_name",
           "First_name, Last_name" );
  firstTime = false;
} while ( ! name.match( nameRegExp ) );
```

All the regular expressions include parenthesized expressions since we echo back the user's input in a different format.

The pattern for a name is:

- one or more word characters (the last name),
- a comma,
- a space, then
- one or more word characters (the first name).

The two names are parenthesized for backreference.

The regular expression, then, is

```
/(\w+), (\w+)/
```

The pattern for a phone number is

- the area code: a `(`, three digits, then a `)`,
- an optional space, then
- the number: three digits, a `-`, then four more digits

The area code and the number are both parenthesized for backreference.

The following is the regular expression; the parentheses that are part of the phone number (and not for backreference) are escaped.

```
/\((\d{3})\) ?(\d{3}-\d{4})/
```

The pattern for a Social Security number is

- three digits,
- a `-`,
- two digits,
- a `-`, then
- four digits

We parenthesize the entire pattern since we echo it back without change:

```
/(\d{3}-\d{2}-\d{4})/
```

After each loop, the values of the implicit variables `RegExp.$1` and (except for the Social Security number) `RegExp.$2` are copied to programmer-defined variables.

This is necessary because the values of these variables are overwritten the next time a match is attempted.

The last thing the program does is output the verified values the user entered.

The name and the phone number are formatted differently.

The code is given on the next two pages.

```
<script type = "text/javascript">
function start()
{
  var
    nameRegExp =  /(\w+), (\w+)/,

    phoneRegExp = /\((\d{3})\) ?(\d{3}-\d{4})/,

    SSNRegExp =   /(\d{3}-\d{2}-\d{4})/,

    name, firstName, lastName,
    phone, areaCode, phNumber,
    SSN,  SSNumber,

    firstTime = true,
    newPrefix =    "Enter your ",
    newSuffix =    " in the format\n",
    repeatPrefix = "Re-enter your ",
    repeatSuffix = ", this time in the format\n";

  do  {
    name = window.prompt(
               ( firstTime
                   ? newPrefix + "name" + newSuffix
                   : repeatPrefix + "name"
                     + repeatSuffix )
              + "Last_name, First_name",
             "First_name, Last_name" );
    firstTime = false;
  } while ( ! name.match( nameRegExp ) );

  firstName = RegExp.$2;
  lastName  = RegExp.$1;

  firstTime = true;
```

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```
  do  {
    phone = window.prompt(
                ( firstTime
                    ? newPrefix + "phone number"
                      + newSuffix
                    : repeatPrefix + "phone number"
                      + repeatSuffix )
               + "(999) 999-9999",
              "(999) 999-9999" );
    firstTime = false;
  } while ( ! phone.match( phoneRegExp ) );

  areaCode = RegExp.$1;
  phNumber = RegExp.$2;

  firstTime = true;

  do  {
    SSN = window.prompt(
              ( firstTime
                  ? newPrefix + "Social Security”
                    + number" + newSuffix
                  : repeatPrefix + "Social Security”
                    + number" + repeatSuffix )
             + "999-99-9999",
            "999-99-9999" );
    firstTime = false;
  } while ( ! SSN.match( SSNRegExp ) );

  SSNumber = RegExp.$1;

  document.write(
   "<p>Your name is: " + firstName + " "
    + lastName + "</p>"
    + "<p>Your phone number is:<br>"
    + "   Area code: " + areaCode + "<br>"
    + "   Number: "    + phNumber + "</p>"
    + "<p>Your Social Security number is: "
    + SSNumber + "</p>" );
}
</script>
```

The following is the rendering when the following values are entered:

Name: Esterline, Albert

Phone number: (336) 334-7245

Social Security number: 242-12-3456

Your name is: Albert Esterline

Your phone number is:
Area code: 336
Number: 334-7245

Your Social Security number is: 242-12-3456