COMP 322 Internet Systems Fall 2006 Quiz 2—Solutions

15 points possible

The HTML document listed below with gaps prompts the user for pairs of initial and final substrings. Each pair is entered as a string with a space between the initial and the final substring (e.g., `in out`). When the user is finished entering these pairs, he clicks the **Cancel** button on the prompt box or strikes the **Esc** key. Then the program repeatedly prompts the user for a string (until he clicks the **Cancel** button on the prompt box or strikes the **Esc** key). For each string, the program checks whether there is an initial-final substring pair that the user entered such that the initial substring appears in the string and the final substring also appears in it but after the initial substring. The initial-final substring pairs are stored in a two-dimensional array `strs` such that `strs[i][0]` is an initial substring and `strs[i][1]` is the corresponding final substring. Function `init` sets up this array. The strings entered by the user are split at the space to give a two-element array, which is assigned to a new row in `strs`. Function `check` repeatedly prompts the user for a string and checks whether there is a pair in array `strs` that matches in the manner described above. It does this with a `do`/`while` loop. Index `i` starts at 0 and variable `found` is initialized to `false`. It goes through the rows in `strs` (indexed by `i`) until `found` becomes `true` or the rows are exhausted (`i` is equal to the length of `strs`). On each iteration, it checks whether `strs[i][0]` occurs in `str` and, if so, whether `strs[i][1]` occurs in `str` at a later position; if so, it sets `found` to `true`.

In the following listing, missing code is identified by Greek letters. These letters are repeated after the listing; you there supply the missing code.

```
<html>
<head>
<title>Quiz2</title>
<script>
var strs = new Array();

init( strs );

check( strs );

function init( strs )
{

  while ( str = window.prompt(
                  "Enter a string with an initial and final segment"
                  + " separated by a space",
                  "" ) )
    _α_____________________________________;
}

function check( strs )
{
  while ( str = window.prompt( "Enter a string", "" )  )  {
    var found = false,
        i = 0;

    do  {
      var loc1 = _β_____________________;

      if ( loc1 != -1 )  {
        var loc2 = _γ_____________________________________________________;

        if ( loc2 != -1 )
          found = true;
      }

      i++;
    } while ( _δ_____________________ );

    if ( found )
      alert("Found");
    else
      alert("Not found");
  }
}
</script>
</head>
</html>
```

α: Set a new row of `strs` to the array obtained by splitting `str` at the space.

Answer (4 points):

```
strs[ strs.length ] = str.split( " " );
```

β: the index in `str` of the initial substring (the first element) at row `i` in `strs` (This will be –1 if the element doesn't occur in `str`.)

Answer (3 points):

```
str.indexOf( strs[i][0] );
```

γ: the index in `str` of the final substring (the second element) at row i in strs, where we start the search from the position where the initial substring was found (i.e., loc1) plus the length of the initial substring. (This will be –1 if the element doesn't occur from this position on in `str`.)

Answer (5 points):

```
str.indexOf( strs[i][1], loc1 + strs[i][0].length );
```

δ: an expression that is `true` if `found` is `false` and `i` is less than the length of `strs`

Answer (3 points):

```
! found && i < strs.length
```

The entire solution file is listed on the following page.

```
<html>
<head>
<title>Quiz2</title>
<script>
var strs = new Array();

init( strs );

check( strs );

function init( strs )
{

  while ( str = window.prompt(
                  "Enter a string with an initial and final segment"
                  + " separated by a space",
                  "" ) )
    strs[ strs.length ] = str.split( " " );
}

function check( strs )
{
  while ( str = window.prompt( "Enter a string", "" )  )  {
    var found = false,
        i = 0;

    do  {
      var loc1 = str.indexOf( strs[i][0] );

      if ( loc1 != -1 )  {
        var loc2 = str.indexOf( strs[i][1], loc1 + strs[i][0].length
);

        if ( loc2 != -1 )
          found = true;
      }

      i++;
    } while ( ! found && i < strs.length );

    if ( found )
      alert("Found");
    else
      alert("Not found");
  }
}
</script>
</head>
</html>
```