CPSC 101 / WMST 201: Practice Problems

Consider the following functions from the ImageViewer Lab:

```
// Function: shuffle_images
// Description: Function used to randomly rearranging the positions of images within the picsRank arra
// Inputs: none
// Outputs: none

1.  function shuffle_images()
2.  {
3.    for (i = 0; i < num_pics - 1; i++)
4.    {
        //generate random number between 'i+1' and 'num_pics-1'
5.      rand_num = i + 1 + Math.floor(Math.random()*(num_pics-i-1));

        //swap image i with image rand_num
6.      swap_image(i, rand_num);
7.    }
8.  }

// Function: swap_images
// Description: Utility function used to swap the positions of two different images.
// Inputs:
// p1: A number, index of the first image to swap
// p2: A number, index of the second image to swap
// Outputs: none

9.  function swap_images(p1, p2)
10. {
11.    var temp;
12.    temp = picsRank[p1];
13.    picsRank[p1] = picsRank[p2];
14.    picsRank[p2] = temp;
15. }
```

(a) Assume that `num_pics` $= 10$ and that for all image index values i between 0 and 9, `picsRank`$[i] = i$.

Consider the function call `swap_images(0,9)` and list the values of `temp`, `picsRank[p1]` and `picsRank[p2]`

- just before line 12 is executed,
- just after line 12 is executed,
- just after line 13 is executed,
- just before line 14 is executed.

(b) As in part (a), assume that `num_pics = 10` and that for all image index values `i` between 0 and 9, `picsRank[i] = i`. Consider a call to function `shuffle_images()`. How many times is the function `swap_images` called?

(c) Describe the effect of the following function call: `swap_images(5,5)`. Describe how function `swap_images` can be modified to avoid wasting valuable computation cycles in cases like this. *Hint: Use an if-statement.*

(d) Explain line 5 precisely and concisely. What kind of a statement is it? What are its effects?

(e) Imagine replacing line 5 with the following statement:

```
rand_num = num_pics-1;
```

How does this change the effect of function `shuffle_images`?

(f) Imagine replacing line 3 with the following statement:

```
for (i = 0; i < num_pics/2 - 1; i++)
```

How does this change the effect of function `shuffle_images`?

(g) Implement a 'goto first' button from the code below:

```
// Function: goto_first_image
// Description: Function used to set the current image to the first image in the list

1. function goto_first_image()
2. {
3.  //insert code here

4.  document[current_img_name].src  = pics[ picsRank[current_img] ];
5.  document.form1.text1.value = pics_text[ picsRank[current_img] ];
6.  document.img1.width       = pics_width[ picsRank[current_img] ];
7.  document.img1.height     = pics_height[ picsRank[current_img] ];
8. }
```