

C2 Solutions

1. Modify the “Hello” program shown in class (Lecture C2) to display the following text on the screen:

```
Hello World
My name is Your Name
```

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Compiling: c:/docume~2/joeb/desktop/16070/concep~1/hello_world.adb (source file time stamp: 2003-09-10 08:55:28)

```
1. -----
2. -- Program : To Display "Hello World
3. --           My Name is Joe B"
4. -- Programmer : Joe B
5. -- Date Last Modified : 09/10/2003
6. -----
7.
8.
9. with Ada.Text_IO;
10.
11. procedure Hello_World is
12.
13. begin -- Hello_World
14.
15.   Ada.Text_IO.Put(Item => "Hello World ");
16.   Ada.Text_IO.New_Line;
17.   Ada.Text_IO.Put(Item => "My Name is Joe B");
18.
19. end Hello_World;
```

19 lines: No errors

2. There are two errors that are seen:

- i. “raised SCREEN.WIN32_FILL_SCREEN_ERROR : screen.adb:99” is seen when the output is redirected to the file.
- ii. “raised SPIDER.HIT_THE_WALL: spider.adb:224” is seen when the output is only displayed on the screen

3. Write an algorithm to use the Feldman “spider package” to draw an inverted triangle as shown below. Turn in a hard copy of your code listing and an electronic copy of your code.

```
RRRRRRR
 R   R
  R  R
   R
    R
```

Problem Analysis:

The inverted triangle consists of 4 lines with the following features:

- i. The top line consists of 7 symbols with no gaps between them
- ii. The following lines have (n-1) blank spaces, followed by a symbol, followed by (7-2n) blank spaces and one symbol (if $7-2n > 0$)

Algorithm:

1. Face the spider East
2. Set Spider color to Red
3. Move spider East 7 steps
4. for I in 2 .. 4 loop
 - i. Set Spider color to None
 - ii. Set Spider direction to South
 - iii. Move Spider 1 step
 - iv. Set Spider direction to West
 - v. Move Spider 7 steps
 - vi. Set Spider direction East
 - vii. Move spider (I-1) spaces
 - viii. Set Spider color to Red
 - ix. Move spider one step in the same direction as last move
 - x. Set Spider color to Black
 - xi. Move spider (n-2*I) steps
 - xii. If (n-2*I) > 0 then
 1. Set Spider color to Red
 2. Move one step
 3. Set Spider color to none
 4. move I-1 steps
5. Stop program execution

Code Listing:

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Compiling: c:/docume~2/joeb/desktop/adatex~1/pset1~1/spider_triangle.adb (source file time stamp: 2003-09-10 10:28:10)

```
1. with Spider;
2. procedure Spider_Triangle is
3. -----
4. --| Program : This program demonstrates display an inverted triangle.
5. --| Programmer : Joe B
6. --| Date Last Modified : 09/10/2003
7. -----
8. N : Integer;
9.
10. begin -- Spider_Triangle
```

```

11. -- initialise the number of lines R's per line to be 7
12. N:=7;
13. Spider.Start;
14. -- initialize the direction to be east and set the symbol to Red
15. Spider.Face(Whichway => Spider.East);
16. Spider.Changecolor(Newcolor => Spider.Red);
17. -- draw the top line with n Red Symbols
18. for I in 1..N loop
19.   Spider.Step;
20. end loop;
21. -- the number of lines for n symbols is (n/2)+1 for n odd
22. for I in 2 .. ((N/2)+1) loop
23.   -- move the spider down to the next line
24.   Spider.Face(Whichway => Spider.South);
25.   Spider.Changecolor(Newcolor => Spider.None);
26.   Spider.Step;
27.   -- face the opposite direction and trace back to the starting point
28.   Spider.Face(Whichway => Spider.West);
29.   for J in 1..N loop
30.     Spider.Step;
31.   end loop;
32.   -- turn the spider back in the right direction
33.   Spider.Face(Whichway => Spider.East);
34.   -- draw the required number of blank spaces
35.   for J in 1 .. I-1 loop
36.     Spider.Step;
37.   end loop;
38.   -- change the symbol to Red
39.   Spider.Changecolor(Newcolor => Spider.Red);
40.   Spider.Step;
41.   -- return the symbol to none
42.   Spider.Changecolor(Newcolor => Spider.None);
43.   -- draw the required number of blank spaces
44.   for J in 1 .. (N-2*I) loop
45.     Spider.Step;
46.   end loop;
47.   -- check to ensure that it is not the last line
48.   if (N-2*I > 0) then
49.     -- change the symbol to red and draw the symbol
50.     Spider.Changecolor(Newcolor => Spider.Red);
51.     Spider.Step;
52.     -- reset the symbol to none and draw the required number of blank spaces
53.     Spider.Changecolor(Newcolor => Spider.None);
54.     for J in 1 .. I-1 loop
55.       Spider.Step;
56.     end loop;
57.   end if;
58.
59. end loop;
60. Spider.Quit;
61. end Spider_Triangle;

```

61 lines: No errors