Assignment 5

Linux and C Programming (62558)

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Contents

Feedback

9.2 Fine solution.

9.3 Fine solution, but be aware that nested function only works with gcc.

10.1 Good answer.

Original Submission

Exercise 9.1

Count number of times n gets assigned the number six.

Answer

Each time through the loop n gets assigned a value from 1-6, at random. Accordingly, the number six's assigned to n varies each time the program is run. I ran the program 3 times and got 3, 2 and 2 six's, respectively.

Source Code

```
/*
Mandatory assignment: 5
Lesson: 9 + 10
Student Name: Mads Richardt
Student Id: s224948
Date: 04/11/2022
```

```
*/

#include <time.h>
#include <stdlib.h>
#include <stdio.h>
#include <string.h>

// Function declarations
void Diceman();
void f1();
unsigned long Factorial(int n);

int main()
{
    puts("**********************");
    puts("Welcome to Assignment 5");
    puts("**********************");

    int selectionVariable = 0;

    while (selectionVariable != 4)
    {
        // Prompt user for selection.
        printf("\n1: Diceman.\n2: Stack Trace.\n3: Factorial.\n4: Close Program.\nPlease choose optic
        scanf("%1d",&selectionVariable);

        switch (selectionVariable)
        {
            case 1:
                puts("");
                puts("*******");
                puts("Diceman");
                puts("*******");

                printf("Rolling dice... ");
                // Call Diceman().
                Diceman();
                break;

            case 2:
                puts("");
                puts("***********");
                puts("Stack Trace");
                puts("***********");

                // Call f1().
                f1();
                break;

            case 3:
                puts("");
                puts("***********");
```

```
                puts("Factorial");
                puts("***********");

                // Prompt user for integer.
                int k;
                printf("Enter a positive integer: ");
                scanf("%d", &k);

                // Call Factorial().
                unsigned long fk = Factorial(k);

                // Print result.
                printf("The value of %u factorial is %lu\n",k, fk);
                break;

            default:
                break;
        }

    }

    puts("\nClosing Program...");
}

// Function definition.
void Diceman()
{
    char action [100];

    // Role dice
    srand(time(0));
    int dice = rand() % 6 + 1;

    switch (dice)
    {
    case 1:
        strcpy(action,"Breakfast!");
        printf("%d! %s\n",dice, action);
        break;
    case 2:
        strcpy(action, "Study!");
        printf("%d! %s\n",dice, action);
        break;
    case 3:
        strcpy(action, "Swim!");
        printf("%d! %s\n",dice, action);
        break;
    case 4:
        strcpy(action, "Go fishing!");
        printf("%d! %s\n",dice, action);
        break;
    case 5:
```

```
        strcpy(action, "Call mom!");
        printf("%d! %s\n",dice, action);
        break;
    case 6:
        strcpy(action, "Back to bed!");
        printf("%d! %s\n",dice, action);
        break;
    default:
        break;
    }
}

void f1()
{
    void f2()
    {
        void f3()
        {
            void f4()
            {
                void f5()
                {
                    puts("f5() called");
                }
                puts("f4() called");
                f5();
            }
            puts("f3() called");
            f4();
        }
        puts("f2() called");
        f3();
    }
    puts("f1() called");
    f2();
}

unsigned long Factorial(int n)
{
    unsigned long f = 1;
    for (int i = 1; i <= n; i++)
    {
        f = f*i;
    }
    return f;
}
```

Updates

In the updated submission listed below, I "denested" the the function f1() from exercise 9.3.

```c
/*
Mandatory assignment: 5
Lesson: 9 + 10
Student Name: Mads Richardt
Student Id: s224948
Date: 04/11/2022
*/

#include <time.h>
#include <stdlib.h>
#include <stdio.h>
#include <string.h>

// Function declarations
void Diceman();
void f1();
void f2();
void f3();
void f4();
void f5();
unsigned long Factorial(int n);

int main() {
    puts("************************");
    puts("Welcome to Assignment 5");
    puts("************************");

    int selectionVariable = 0;

    while (selectionVariable != 4) {
        // Prompt user for selection.
        printf("\n1: Diceman.\n2: Stack Trace.\n3: Factorial.\n4: Close Program.\nPlease choose optic
        scanf("%1d",&selectionVariable);

        switch (selectionVariable) {
            case 1:
                puts("\n*******");
                puts("Diceman");
                puts("*******");

                printf("Rolling dice... ");
                // Call Diceman().
                Diceman();
                break;

            case 2:
                puts("\n***********");
                puts("Stack Trace");
                puts("***********");

                // Call f1().
                f1();
```

```
                break;

            case 3:
                puts("\n***********");
                puts("Factorial");
                puts("***********");

                // Prompt user for integer.
                int k;
                printf("Enter a positive integer: ");
                scanf("%d", &k);

                // Call Factorial().
                unsigned long fk = Factorial(k);

                // Print result.
                printf("The value of %u factorial is %lu\n",k, fk);
                break;

            default:
                break;
        }
    }
    puts("\nClosing Program...");
    return 0;
}

// Function definition.
void Diceman() {
    char action [100];

    // Role dice
    srand(time(0));
    int dice = rand() % 6 + 1;

    switch (dice) {
    case 1:
        strcpy(action,"Breakfast!");
        printf("%d! %s\n",dice, action);
        break;
    case 2:
        strcpy(action, "Study!");
        printf("%d! %s\n",dice, action);
        break;
    case 3:
        strcpy(action, "Swim!");
        printf("%d! %s\n",dice, action);
        break;
    case 4:
        strcpy(action, "Go fishing!");
        printf("%d! %s\n",dice, action);
        break;
```

```
    case 5:
        strcpy(action, "Call mom!");
        printf("%d! %s\n",dice, action);
        break;
    case 6:
        strcpy(action, "Back to bed!");
        printf("%d! %s\n",dice, action);
        break;
    default:
        break;
    }
}

void f5() {}

void f4() {
    f5();
}

void f3() {
    f4();
}

void f2() {
    f3();
}

void f1() {
    f2();
}

unsigned long Factorial(int n)
{
    unsigned long f = 1;
    for (int i = 1; i <= n; i++) {
        f = f*i;
    }
    return f;
}
```