

1.) What is the output of the following program?

```
C: > Users > DARWIN > Downloads > CMSC21 > Assignment 4 > C as1.c > main(void)
1  #include <stdio.h>
2
3  int main(void){
4      int i;
5      i = 1;
6
7      while (i <= 128) {
8          printf("%d ", i);
9          i *= 2;
10     }
11     return 0;
12 }
13
14 /*The output of the program is 1 2 4 8 16 32 64 128 (with spaces)*/
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

Windows PowerShell
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PS C:\Users\DARWIN> cd "c:\Users\DARWIN\Downloads\CMSC21\Assignment 4\" ; if (\$?) { gcc as1.c -o as1 } ; if (\$?) { .\as1 }

1 2 4 8 16 32 64 128
PS C:\Users\DARWIN\Downloads\CMSC21\Assignment 4>

2.) Which one of the following statements is not equivalent to the other two (assuming that the loop bodies are the same)?

```
C: > Users > DARWIN > Downloads > CMSC21 > Assignment 4 > C as2.c > ...
1  #include <stdio.h>
2
3  int main(void){
4      int i, n , m;
5      i = n = m = 0;
6
7      while (i<10){
8          printf("WHILE: %d \n", i++); //optional statement to compare their output similarities.
9      }
10
11     for(; n<10;){
12         printf("FOR: %d \n", n++);
13     }
14
15     /*Assuming that the loop bodies are the same, the "while" and "for" statements are considered equivalent.
16     The first (initialization) and third (update) expressions are omitted in "for" statement, only the second (condition).
17     Hence, the resulting Loop is nothing more than a while statement.
18     */
19
20     do{
21         printf("DO: %d \n", m++);
22     }while(m<10);
23
24     /* This leaves us with the option that the "do" statement is the one that differs in terms of execution.
25     The body gets executed first before testing the condition.
26     */
27
28     return 0;
29 }
30
```

```

WHILE: 0
WHILE: 1
WHILE: 2
WHILE: 3
WHILE: 4
WHILE: 5
WHILE: 6
WHILE: 7
WHILE: 8
WHILE: 9
FOR: 0
FOR: 1
FOR: 2
FOR: 3
FOR: 4
FOR: 5
FOR: 6
FOR: 7
FOR: 8
FOR: 9
DO: 0
DO: 1
DO: 2
DO: 3
DO: 4
DO: 5
DO: 6
DO: 7
DO: 8
DO: 9
PS C:\Users\DARWIN\Downloads\CMSC21\Assignment 4>

```

3.) Convert item 1 into an equivalent for statement. You can validate your answer by checking if the produced outputs by both the while and for statements are similar

```

C: > Users > DARWIN > Downloads > CMSC21 > Assignment 4 > C as3.c > ...
1  #include <stdio.h>
2
3  int main(void){
4      int i;
5      i = 1;
6
7      for (; i <= 128;){
8          printf("%d ", i);
9          i *= 2;
10     }
11     return 0;
12 }
13

```

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```

PS C:\Users\DARWIN> cd "c:\Users\DARWIN\Downloads\CMSC21\Assignment 4\" ; if ($?) { gcc as3.c -o as3 } ; if ($?) { .\as3 }
1 2 4 8 16 32 64 128
PS C:\Users\DARWIN\Downloads\CMSC21\Assignment 4>

```

4.) Write a code that computes for the power of two:

```
C: > Users > DARWIN > Downloads > CMSC21 > Assignment 4 > C as4.c > ...
1  #include <stdio.h>
2  #include <math.h>
3
4  int main(void){
5      int i, exp;
6
7      printf("TABLES OF POWERS OF TWO\n n      2 to the n\n--- -----\n");
8
9      for (i = 0; i<=10; i++){
10         exp = pow(2, i); //computes 2 with the power of i
11
12         printf(" %d          %d\n", i, exp);
13     }
14     return 0;
15 }
```

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PS C:\Users\DARWIN> cd "c:\Users\DARWIN\Downloads\CMSC21\Assignment 4\" ; if (\$?) { gcc as4.c -o as4 } ; if (\$?) { .\as4 }

```
TABLES OF POWERS OF TWO
n      2 to the n
--- -----
0          1
1          2
2          4
3          8
4         16
5         32
6         64
7        128
8        256
9        512
10       1024
PS C:\Users\DARWIN\Downloads\CMSC21\Assignment 4>
```

5.) Write a program that displays a one-month calendar.

```
C: > Users > DARWIN > Downloads > CMSC21 > Assignment 4 > C as5.c > ...
1  #include <stdio.h>
2
3  int main(void){
4      int i, n, starting_day, blank_days;
5
6
7      //Asks the user inputs
8      printf("Enter number of days in month: ");
9      scanf("%d", &n);
10
11     printf("Enter starting day of (1=Sun, 7=Sat): ");
12     scanf("%d", &starting_day);
13     printf("\n");
14
15     //Validates the correct amount of days in a month.
16     if (n<=31 && n>=28)
17     {
18         //WHILE LOOP: Prints the blank days of the first week
19         blank_days = 1;
20         while(blank_days<starting_day){
21             printf("   ", blank_days++);
22         }
23
24         //FOR LOOP: Prints the calendar numbers
25         for (i = 1; i <= n; i++) {
26
27             //Adds a "newline" after a specific number in the calendar
28             if (i == 8-starting_day||i == 15-starting_day||i == 22-starting_day||i == 29-starting_day||i == 36-starting_day){
29                 printf("%3d\n", i);
30             }
31
32             else{
33                 printf("%3d", i);
34             }
35         }
36     }
37     else
38     {
39         printf("Invalid Number of Days: %d", n);
40         return 0;
41     }
42 }
43 }
```

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PS C:\Users\DARWIN> cd "c:\Users\DARWIN\Downloads\CMSC21\Assignment 4\" ; if (\$?) { gcc as5.c -o as5 } ; if (\$?) { .\as5 }

Enter number of days in month: 30
Enter starting day of (1=Sun, 7=Sat): 6

```

      1 2
 3 4 5 6 7 8 9
10 11 12 13 14 15 16
17 18 19 20 21 22 23
24 25 26 27 28 29 30
PS C:\Users\DARWIN\Downloads\CMSC21\Assignment 4> 
```

GITHUBLINK: <https://github.com/CarlDarwinCortes/CMSC21/upload/main/Lecture4/Assignments>