

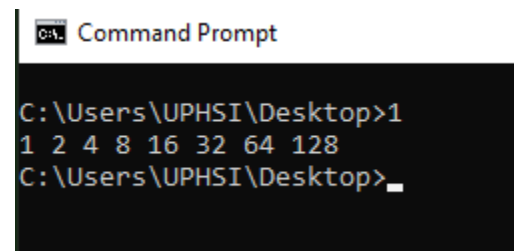
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CMSC 21 – Section 1
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Machine Problem

1.

```
1  #include <stdio.h>
2
3  int main(void)
4  {
5      int i;
6
7      i = 1;
8
9      while (i <= 128) {
10         printf("%d ", i);
11         i *= 2;
12     }
13
14     return 0;
15 }
16
17
18 //its output will be "1 2 4 8 16 32 64 128"
19 //in other words, 2^0, 2^1, 2^2,...,2^7
```



Command Prompt

```
C:\Users\UPHSI\Desktop>1
1 2 4 8 16 32 64 128
C:\Users\UPHSI\Desktop>_
```

2.

```
//c) do {...} while (i < 10);

#include <stdio.h>

int main(void) {
    int i = 1;

    do {
        printf("%d ", i);
        i *= 2;
    } while (i < 10);

    return 0;
}
```

cmd Command Prompt

```
C:\Users\UPHSI\Desktop>2
1 2 4 8
C:\Users\UPHSI\Desktop>
```

3.

```
//convert item 1 into an equivalent for statement which prints 2^0 - 2^7  
  
#include <stdio.h>  
  
int main() {  
    int i;  
  
    for (i = 1; i <= 128; i *= 2) {  
        printf("%d ", i);  
    }  
  
    return 0;  
}
```

CA. Command Prompt

```
C:\Users\UPHSI\Desktop>3  
1 2 4 8 16 32 64 128  
C:\Users\UPHSI\Desktop>_
```

4.

```
1 //asks the user for an exponent that 2 is to be raised by
2
3 #include <stdio.h>
4
5 int main() {
6     int exponent, result = 1;
7
8     printf("Give an exponent for the integer 2: ");
9     scanf("%d", &exponent);
10
11     for (int i = 0; i < exponent; i++) {
12         result *= 2;
13     }
14
15     printf("2 to the power of %d is %d\n", exponent, result);
16
17     return 0;
18 }
19
```

CA Command Prompt

```
C:\Users\UPHSI\Desktop>4
Give an exponent for the integer 2: 1
2 to the power of 1 is 2

C:\Users\UPHSI\Desktop>4
Give an exponent for the integer 2: 2
2 to the power of 2 is 4

C:\Users\UPHSI\Desktop>4
Give an exponent for the integer 2: 3
2 to the power of 3 is 8

C:\Users\UPHSI\Desktop>4
Give an exponent for the integer 2: 4
2 to the power of 4 is 16

C:\Users\UPHSI\Desktop>4
Give an exponent for the integer 2: 5
2 to the power of 5 is 32
```

5.

```
1  #include <stdio.h>
2
3  int main() {
4      int days, startmonth;
5
6      do {
7          printf("Enter the number of days in the month: "); // asks user for the number of days
8          scanf("%d", &days);
9
10         if (days < 28 || days > 31) {
11             printf("Invalid number of days. Please enter a value between 1 and 31.\n");
12         }
13     } while (days < 28 || days > 31);
14
15     do {
16         printf("Enter the day of the week the month begins (1 = Sun, 7 = Sat): "); // asks user which day of the week the month starts
17         scanf("%d", &startmonth);
18
19         if (startmonth < 1 || startmonth > 7) {
20             printf("Invalid start day. Please enter a value between 1 and 7.\n");
21         }
22     } while (startmonth < 1 || startmonth > 7);
23
24     printf("Sun Mon Tue Wed Thu Fri Sat\n"); // prints the days of the week on top of the calendar
25
26     for (int i = 0; i < startmonth - 1; i++) { // prints spaces before the first day of the month as specified by the user
27         printf("    ");
28     }
29
30     for (int day = 1; day <= days; day++) { // prints the days in the month
31         printf("%-5d", day);
32
33         if ((startmonth + day - 1) % 7 == 0) { // moves to the next line after reaching Saturday
34             printf("\n");
35         }
36     }
37
38     return 0;
39 }
40
```

Command Prompt - 5

Microsoft Windows [Version 10.0.19045.3086]
(c) Microsoft Corporation. All rights reserved.

C:\Users\UPHSI>cd desktop

C:\Users\UPHSI\Desktop>

Enter the number of days in the month: 31

Enter the day of the week the month begins (1 = Sun, 7 = Sat): 3

Sun	Mon	Tue	Wed	Thu	Fri	Sat
-----	-----	-----	-----	-----	-----	-----

		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
----	----	----	----	----	----	----

6. What isn't specified will be then deemed as false. It is said that only the first and third pathways are open. Thus, my answers for both letters are:

a. `bool pathway[] = {[0] = true, [2] = true};`

b. `bool pathway[] = {true, false, true};`