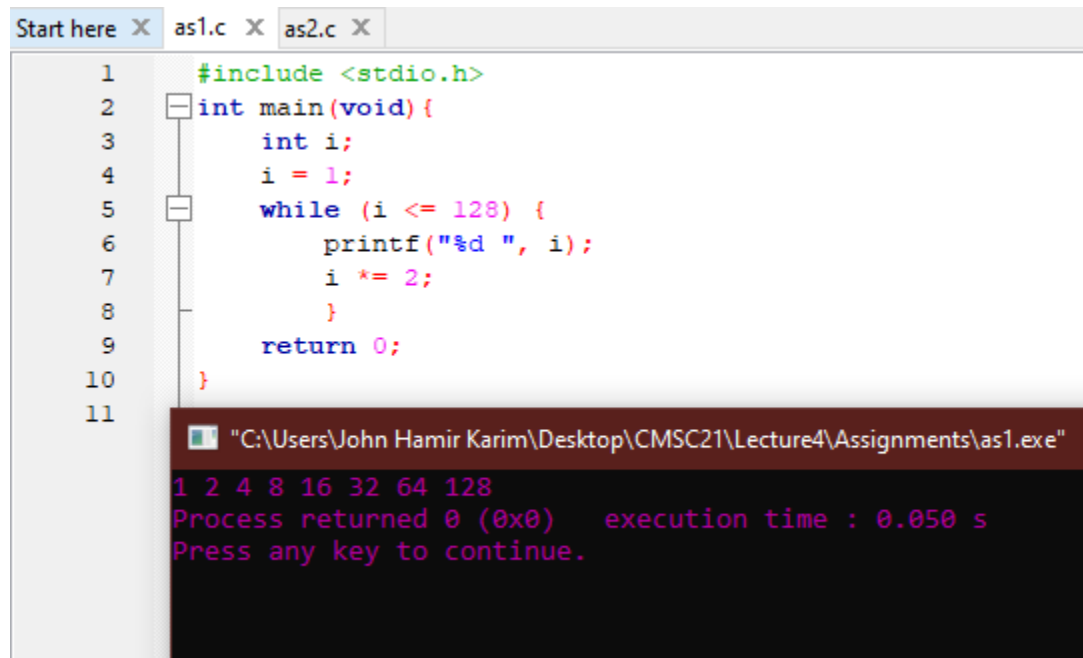


Loop/Repetition Statements

Lecture 4 Assignments

1. What is the output of the following program?

- The program prints out the powers of 2.



The screenshot shows a code editor with a C program and a terminal window displaying its output. The code is as follows:

```
1  #include <stdio.h>
2  int main(void) {
3      int i;
4      i = 1;
5      while (i <= 128) {
6          printf("%d ", i);
7          i *= 2;
8      }
9      return 0;
10 }
11
```

The terminal window shows the output of the program:

```
"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as1.exe"
1 2 4 8 16 32 64 128
Process returned 0 (0x0)   execution time : 0.050 s
Press any key to continue.
```

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

- Although their outputs are the same, code 'c' always executes at least once, regardless of the value of 'i'. On the other hand, 'a' and 'b', will check the 'i' value first before executing. If $i \geq 10$, a and b will not run at all, but c will run once.

The screenshot shows a C program named `as2.c` with three different loop structures, each printing the numbers 10 through 19. The first loop is a `while` loop, the second is a `for` loop, and the third is a `do-while` loop. The program's output is shown in a terminal window, displaying the number 10, the execution time (0.042 s), and a prompt to press any key to continue.

```
#include <stdio.h>
int main(void) {
    int i;
    i = 10;
    //a
    while (i < 10) {
        printf("%d ", i);
        i += 2;
    }
    printf("\n");

    //b
    i = 10;
    for (; i < 10;) {
        printf("%d ", i);
        i += 2;
    }
    printf("\n");

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

    return 0;
}
```

"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as2.exe"

10
Process returned 0 (0x0) execution time : 0.042 s
Press any key to continue.

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.

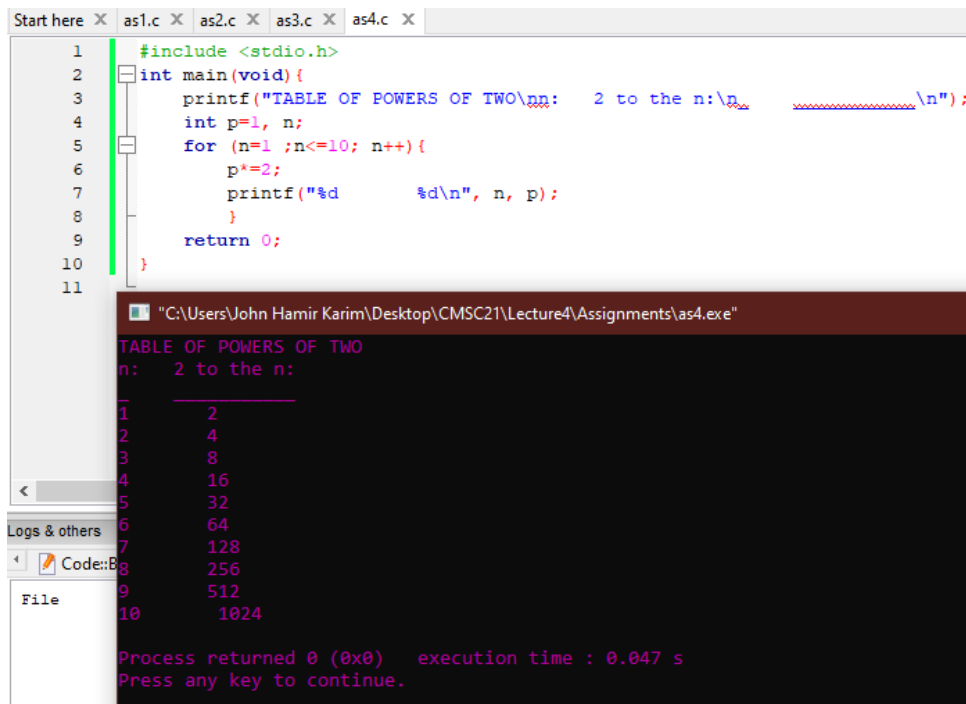
The screenshot shows a C program named `as3.c` using a `for` loop to print the powers of 2 from 1 to 128. The program's output is shown in a terminal window, displaying the sequence of numbers 1 2 4 8 16 32 64 128, the execution time (0.051 s), and a prompt to press any key to continue.

```
1 #include <stdio.h>
2 int main(void) {
3     int i;
4     for (i=1 ; i<=128; i*=2) {
5         printf("%d ", i);
6     }
7     return 0;
8 }
9
```

"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as3.exe"

1 2 4 8 16 32 64 128
Process returned 0 (0x0) execution time : 0.051 s
Press any key to continue.

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



The screenshot shows a C program in a code editor and its execution output in a terminal window. The code calculates the powers of two for n from 1 to 10. The output displays a table with n and 2^n.

```
1 #include <stdio.h>
2 int main(void){
3     printf("TABLE OF POWERS OF TWO\n\n: 2 to the n:\n\n");
4     int p=1, n;
5     for (n=1 ;n<=10; n++){
6         p*=2;
7         printf("%d\t\t%d\n", n, p);
8     }
9     return 0;
10 }
11
```

Output:

```
"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as4.exe"
TABLE OF POWERS OF TWO
n: 2 to the n:
1      2
2      4
3      8
4     16
5     32
6     64
7    128
8    256
9    512
10   1024

Process returned 0 (0x0)   execution time : 0.047 s
Press any key to continue.
```

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

```
Start here X as1.c X as2.c X as3.c X as4.c X as5.c X Untitled5.c X
10 printf("\nSun|Mon|Tue|Wed|Thu|Fri|Sat|\n");
11
12 if((num_days>27 && num_days <32) && (day_start >0 && day_start<8)){
13     for(spaces=1;spaces<day_start; spaces++){
14         printf("    ");
15     }
16     for(dates=1; dates<=num_days; dates++){
17         if ((dates+spaces)%7==1){
18             if(dates<10){
19                 printf(" %d|\n", dates);
20             }
21             else{
22                 printf(" %d|\n", dates);}\
23             }
24         else{
25             if(dates<10){
26                 printf(" %d|", dates);
27             }
28         }

```

"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as5.exe"

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

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	27	28
29	30					

Process returned 0 (0x0) execution time : 13.612 s
Press any key to continue.

Github: <https://github.com/HelloCigar/CMSC21/tree/main/Lecture4/Assignments>