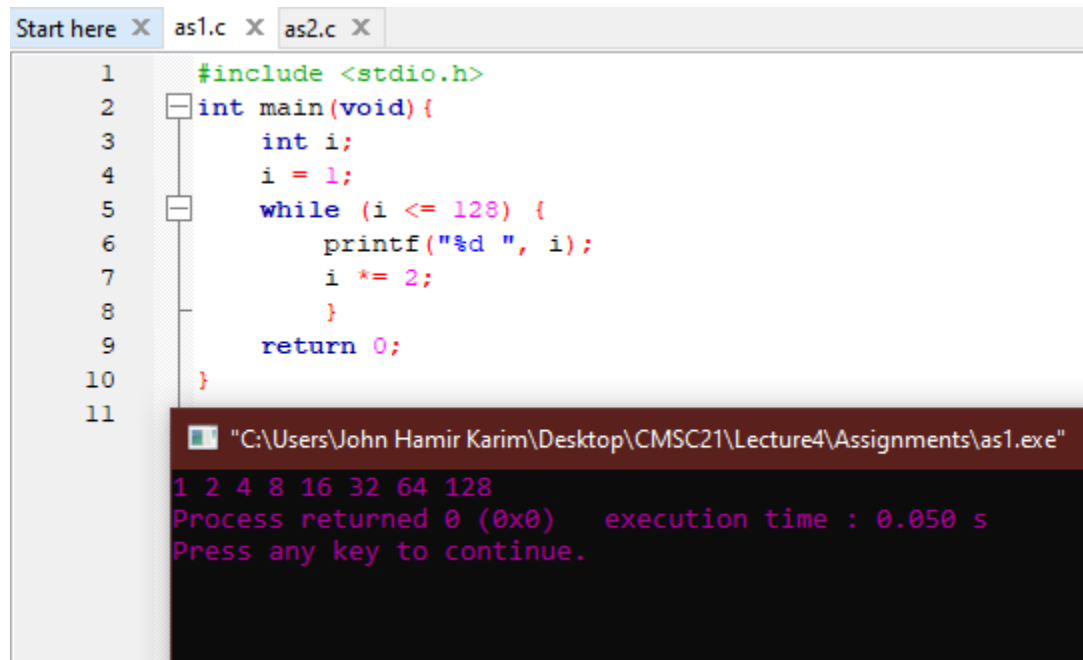


Loop/Repetition Statements

Lecture 4 Assignments

1. What is the output of the following program?

- The program prints out the powers of 2.



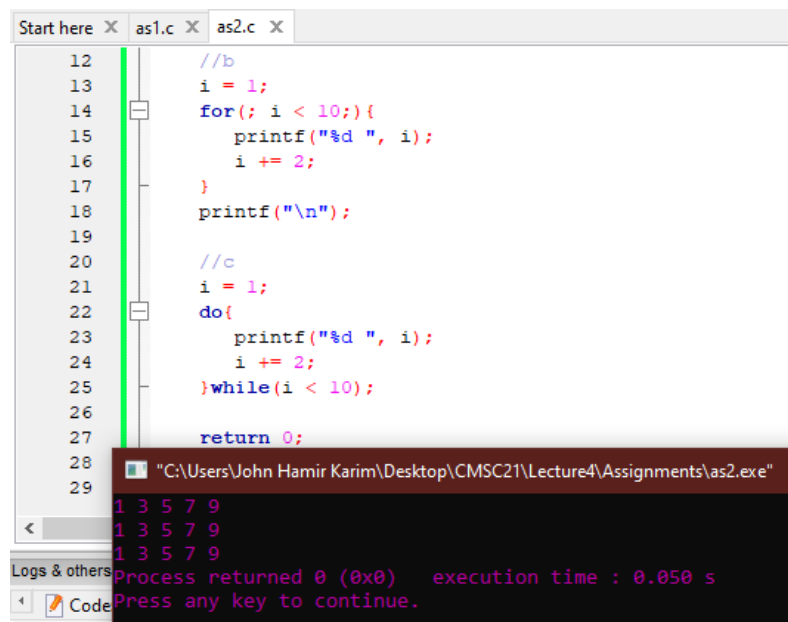
The screenshot shows a C program in a text editor with tabs for 'Start here', 'as1.c', and 'as2.c'. The code in 'as1.c' is as follows:

```
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
```

Below the code, a terminal window shows the execution of 'as1.exe'. The output is '1 2 4 8 16 32 64 128', followed by 'Process returned 0 (0x0) execution time : 0.050 s' and '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 $i > 10$, a and b will not run at all, but c will run once.



The screenshot shows a C program in a text editor with tabs for 'Start here', 'as1.c', and 'as2.c'. The code in 'as2.c' is as follows:

```
12 //b
13 i = 1;
14 for(; i < 10;){
15     printf("%d ", i);
16     i += 2;
17 }
18 printf("\n");
19
20 //c
21 i = 1;
22 do{
23     printf("%d ", i);
24     i += 2;
25 }while(i < 10);
26
27 return 0;
28
29
```

Below the code, a terminal window shows the execution of 'as2.exe'. The output is '1 3 5 7 9' on three separate lines, followed by 'Process returned 0 (0x0) execution time : 0.050 s' and '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.

```
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:

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

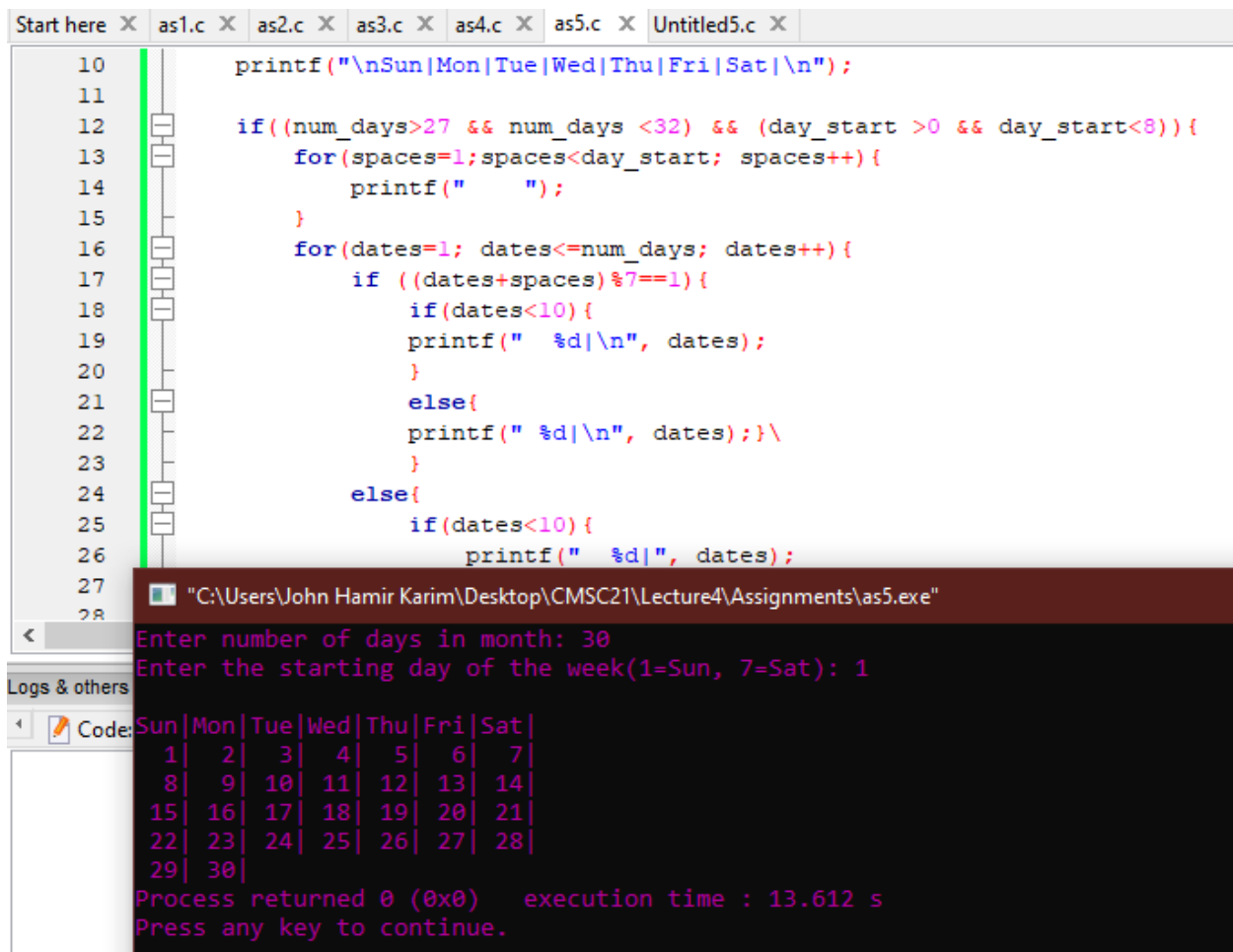
"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as4.exe"

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.



The screenshot shows a C program in a code editor with tabs for 'Start here', 'as1.c', 'as2.c', 'as3.c', 'as4.c', 'as5.c', and 'Untitled5.c'. The code is as follows:

```
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     }
```

The execution output is shown in a terminal window titled '"C:\Users\John Hamir Karim\Desktop\CMSC21\Lecture4\Assignments\as5.exe"'. It shows the user inputting 30 for the number of days and 1 for the starting day of the week. The resulting calendar is displayed as follows:

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>