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BSCS CMSC 21-1

1. The output of the program is: `1 2 4 8 16 32 64 128`

C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > C as1.c > main(void)

```c
#include <stdio.h>

int main(void)
{
    int i;
    i = 1;
    while (i <= 128) {
        printf("%d ", i);
        i *= 2;
    }
    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4> cd "c:\Users\mjpar\Document
c -o as1 } ; if ($?) { .\as1 }
1 2 4 8 16 32 64 128
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4>
```

C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > C as2.c > main(void)

```c
#include <stdio.h>

int main(void) {
    int i = 0; // test var
    printf("While Loop:\n");
    while (i < 10) {
        printf("%d ", i);
        i++;
    }

    i = 0; // test var
    printf("\nFor Loop:\n");
    for (; i < 10;) {
        printf("%d ", i);
        i++;
    }

    i = 0; // test var
    printf("\nDo-While Loop:\n");
    do {
        printf("%d ", i);
        i++;
    } while (i < 10);

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4> cd "c:\Users\mjpar\Documents
c -o as2 } ; if ($?) { .\as2 }
While Loop:
0 1 2 3 4 5 6 7 8 9
For Loop:
0 1 2 3 4 5 6 7 8 9
Do-While Loop:
0 1 2 3 4 5 6 7 8 9
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4>
```

2. All three loops essentially produce the same output if `i < 10` is true. In the example above with test variable `i = 0`, all three loops produce the same output. In the next example below with test variable `i = 11`, the do-while loop is the outlier of the three because it will still execute the body of the loop even if the condition is not

satisfied.

C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > as2.c > main(void)

```c
#include <stdio.h>

int main(void) {
    int i = 11; // test var
    printf("While Loop:\n");
    while (i < 10) {
        printf("%d ", i);
        i++;
    }

    i = 11; // test var
    printf("\nFor Loop:\n");
    for (; i < 10;) {
        printf("%d ", i);
        i++;
    }

    i = 11; // test var
    printf("\nDo-While Loop:\n");
    do {
        printf("%d ", i);
        i++;
    } while (i < 10);

    return 0;
}
```

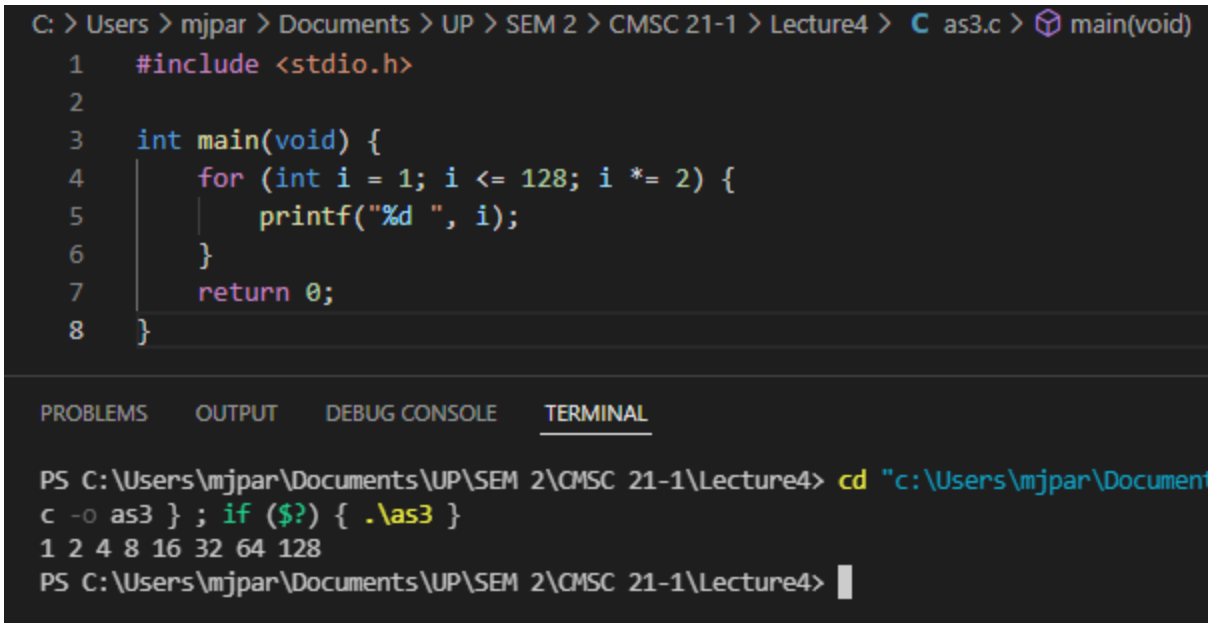
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4> cd "c:\Users\mjpar\Documents
c -o as2 } ; if ($?) { .\as2 }
While Loop:

For Loop:

Do-While Loop:
11
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4>
```

3.


C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > as3.c > main(void)
1 #include <stdio.h>
2
3 int main(void) {
4 for (int i = 1; i <= 128; i *= 2) {
5 printf("%d ", i);
6 }
7 return 0;
8 }
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4> cd "c:\Users\mjpar\Document
c -o as3 } ; if ($?) { .\as3 }
1 2 4 8 16 32 64 128
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4>

4.

C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > C as4.c > main(void)

```c
#include <stdio.h>

int main(void) {
    int n, y = 1;

    printf("n = ");
    scanf("%d", &n);

    printf("\n  n   2^n\n----------\n");
    for (int x = 0; x <= n; x++) {
        printf("%3d %4d\n", x, y);
        y *= 2;
    }

    return 0;
}
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4> cd "c:\Users\mjpar\Documents
c -o as4 } ; if ($?) { .\as4 }
n = 10

  n   2^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\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4>
```

5.

C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > C as5.c > ...

```c
#include <stdio.h>

int main(void) {
    int days, weekday;

    /* Initializing the # of days in the month. */
    while (1) {
        printf("How many days in the month? Enter the number.\n   [1] 28\n   [2] 30\n   [3] 31\n[INPUT] ");
        scanf("%d", &days);

        if (days < 1 || days > 3) { // Input validation.
            printf("\nInvalid input! Enter 1, 2, or 3 only.\n");
        }
        else { // If valid, break.
            break;
        }
    }

    /* Initializing the start of the weekday. */
    while (1) {
        printf("\nWhich day of the week to start with? Enter the number.\n   [1] Sunday\n   [2] Monday\n   [3] Tuesday
        scanf("%d", &weekday);

        if (weekday < 1 || weekday > 7) { // Input validation.
            printf("\nInvalid input! Enter 1 to 7 only.\n");
        }
        else { // If valid, break.
            break;
        }
    }

    /* Initializing variable "days" using switch-case. */
    switch(days) {
        case 1:
            days = 28;
            break;
        case 2:
            days = 30;
            break;
        case 3:
            days = 31;
            break;
    }

    /* Printing standard calendar format of days of the week. */
    printf("\nSu Mo Tu We Th Fr Sa\n");
    for (int n = 1; n < weekday; n++) { // Prints spaces according to which weekday the calendar starts at.
        printf("   ");
    }

    for (int n = 1; n <= days; n++) { // Prints spaces between # of days of the month.
        printf("%2d ", n);

        if (n % 7 == ((8 - weekday) % 7)) { // Signifies end of row using (8 - weekday) % 7 and prints newline.
            printf("\n");
        }
    }
    return 0;
}
```

C: > Users > mjpar > Documents > UP > SEM 2 > CMSC 21-1 > Lecture4 > C as5.c > ...

```c
#include <stdio.h>

int main(void) {
    int days, weekday;

    /* Initializing the # of days in the month. */
    while (1) {
        printf("How many days in the month? Enter the number.\n   [1] 28\n   [2] 30\n   [3] 31\n[INPUT] ");
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL

```
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4> cd "c:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4\" ; if ($?) {
c -o as5 } ; if ($?) { .\as5 }
How many days in the month? Enter the number.
   [1] 28
   [2] 30
   [3] 31
[INPUT] 3

Which day of the week to start with? Enter the number.
   [1] Sunday
   [2] Monday
   [3] Tuesday
   [4] Wednesday
   [5] Thursday
   [6] Friday
   [7] Saturday
[INPUT] 4

Su Mo Tu We Th Fr Sa
         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 31
PS C:\Users\mjpar\Documents\UP\SEM 2\CMSC 21-1\Lecture4>
```