Loop/Repetition Statements
Lecture 4 Assignments

1. What is the output of the following program?

```c
#include <stdio.h>

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

```
1248163264128

...Program finished with exit code 0
Press ENTER to exit console.
```

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

a.

```c
#include <stdio.h>


int main(void)
{
    int i;
    i = 1;
    while (i < 10){
        printf("%d\n", i);
        i++;
    }
    return 0;
}
```

b.

```c
int main(void)
{
    int i;
    for (i=1; i < 10; i++){
        printf("%d\n", i);
    }
    return 0;
}
```

c.

```c
int main(void)
{
    int i=1;

    do{
        printf("%d\n", i);
        i++;
    }
    while (i < 10);
    return 0;
}
```

Loop/Repetition Statements
Lecture 4 Assignments

- The two equivalent statements are the while loop and for loop. Do while is not equivalent to the two. In a and b, it tested the condition first before running the loop and will check if the condition is true. In c which is the do while loop, the condition can be seen in the last part of the code (while loop).

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
#include <stdio.h>

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

```
1248163264128

...Program finished with exit code 0
Press ENTER to exit console.
```

```c
#include <stdio.h>

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

```
1248163264128

...Program finished with exit code 0
Press ENTER to exit console.
```

-They have the same output (while and for loop).

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

```c
#include <stdio.h>

int main(void)
{
    int n;
    int i=1;
    int power = 2;

    printf("\n\n<< This program calculates the power of a number>>\n");
    printf("\n");
    printf("\nPlease enter a number: ");
    scanf("%d", &n);

    for (i=2; i<=n; i++){
        power = power*2;
    }
    printf("\nPower of two of the input is : %d",power);
}
```

```
<< This program calculates the power of a number>> (2 to the n)

Please enter a number: 9

Power of two of the input is : 512
```

https://github.com/Geez-l/CMSC-21.git

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

```c
int main(void)
{
  //declaring variables

  int i, j, days_month, startday_week;

  printf("\n\n<< This program displays one month calendar >>\n");

  //ask user input for the number of days
  printf("\nEnter number of days in month: ");
  scanf("%d", &days_month);

  /*set a condition to display an error message
    if it is less than 28 or greater than 31 */
  if (days_month < 28  || days_month > 31 ){
    printf("Please recheck input");
  }
  else{

    // ask user input for the start of the day in the week
    printf("Enter starting day of the week (1=Sun, 7=Sat): ");
    scanf("%d", &startday_week);

    /*set a condition to display an error message
    if user input is less than 1 or greater than 7 */
    if(startday_week < 1 || startday_week > 7){
        printf("Please recheck input\n");
    }
    else{

        // improves the readability of the program
        printf("\t\t2022 Calendar\n");
        printf(" Su  Mo  Tu  We  Th  Fr  Sa\n");
        printf(" --  --  --  --  --  --  --\n\n");

        //printing the blank days of the first week
        for (i=1; i < startday_week; i++)
            printf("    ");

        //printing the calendar numbers
        for (j=1; j <= days_month; i++, j++){
            printf("%3d ", j);

            /*if statement tests whether i is the last day in the week
            then, it prints a new-line character.*/
            if (i % 7 == 0)
                printf("\n");
        }


    }


  }


  return 0;
}
```