

HW08 PART1

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CODE:

```
#include <stdio.h>

double factorial(double n);
double pow(double x,int n);
double sin(double x,int term_number);

int main(){

    double degree,radian,result,pi;
    int term_number;

    pi=3.141592;

    printf("Angle value in degrees : \n");
    scanf("%lf",&degree);
    printf("Number of terms to use in Taylor Expansion: \n");
    scanf("%d",&term_number);

    radian=degree*pi/180.0;

    result=sin(radian,term_number);

    printf("Sin %0.0lf : %lf\n",degree,result);

    return 0;
}

double factorial(double n){

    double factorial_result = 1.0;

    for(double i=1.0;i<=n;i++){

        factorial_result*=i;
    }

    return factorial_result;
}

double pow(double x,int n){
```

```

double pow_result = 1.0;

for(int i=0;i<n;i++){

    pow_result*=x;

}

return pow_result;

}

double sin(double x,int term_number){

    double total_taylor_series=0.0;

    for(int i=1;i<=term_number;i++){

        total_taylor_series+=pow(-1,i+1)*pow(x,2*i-1)/factorial(2*i-1);

    }

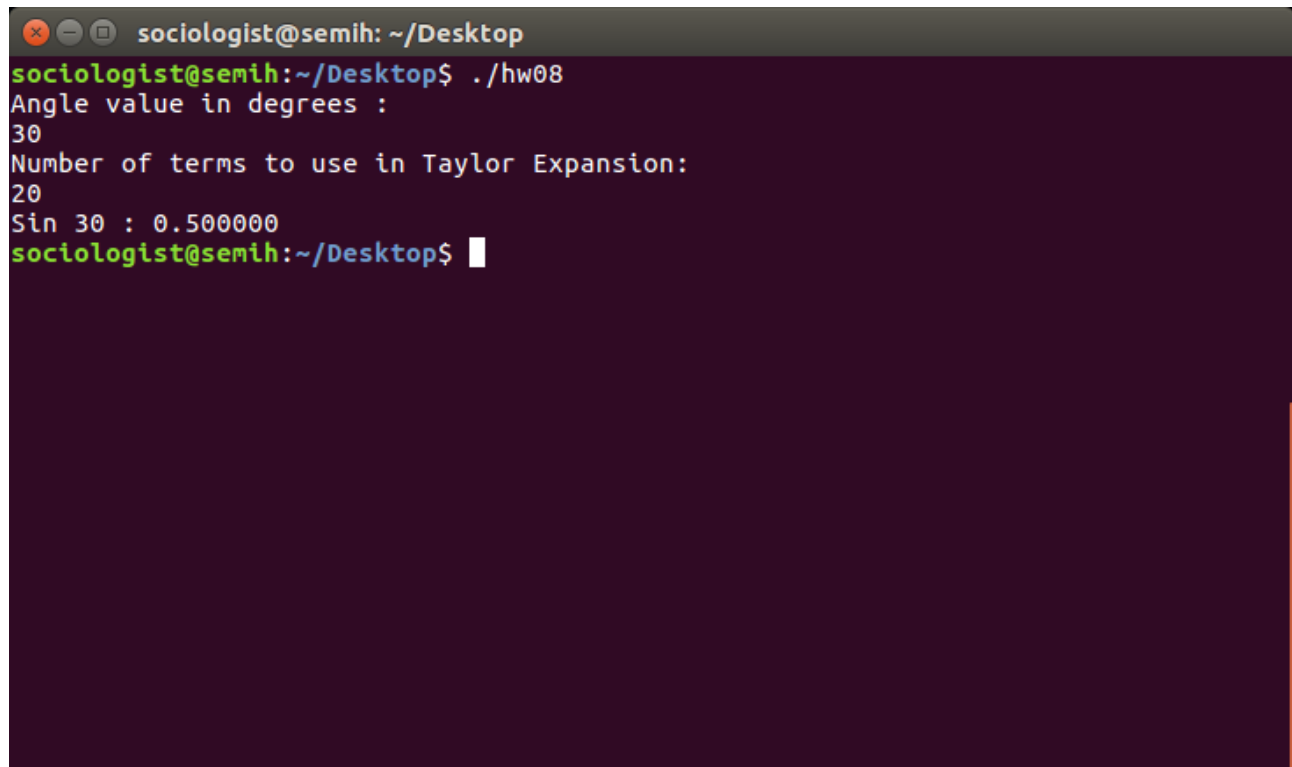
    return total_taylor_series;

}

```

SCREENSHOTS:

sin30:



```

sociologist@semih: ~/Desktop
sociologist@semih:~/Desktop$ ./hw08
Angle value in degrees :
30
Number of terms to use in Taylor Expansion:
20
Sin 30 : 0.500000
sociologist@semih:~/Desktop$

```

sin31:

```
sociologist@semih: ~/Desktop
sociologist@semih:~/Desktop$ ./hw08
Angle value in degrees :
31
Number of terms to use in Taylor Expansion:
30
Sin 31 : 0.515038
sociologist@semih:~/Desktop$
```

sin32:

```
sociologist@semih: ~/Desktop
sociologist@semih:~/Desktop$ ./hw08
Angle value in degrees :
32
Number of terms to use in Taylor Expansion:
40
Sin 32 : 0.529919
sociologist@semih:~/Desktop$
```

sin33:

```
sociologist@semih: ~/Desktop
sociologist@semih:~/Desktop$ ./hw08
Angle value in degrees :
33
Number of terms to use in Taylor Expansion:
50
Sin 33 : 0.544639
sociologist@semih:~/Desktop$
```

sin34:

```
sociologist@semih: ~/Desktop
sociologist@semih:~/Desktop$ ./hw08
Angle value in degrees :
34
Number of terms to use in Taylor Expansion:
60
Sin 34 : 0.559193
sociologist@semih:~/Desktop$
```

sin35:

```
sociologist@semih: ~/Desktop
sociologist@semih:~/Desktop$ ./hw08
Angle value in degrees :
35
Number of terms to use in Taylor Expansion:
90
Sin 35 : 0.573576
sociologist@semih:~/Desktop$
```