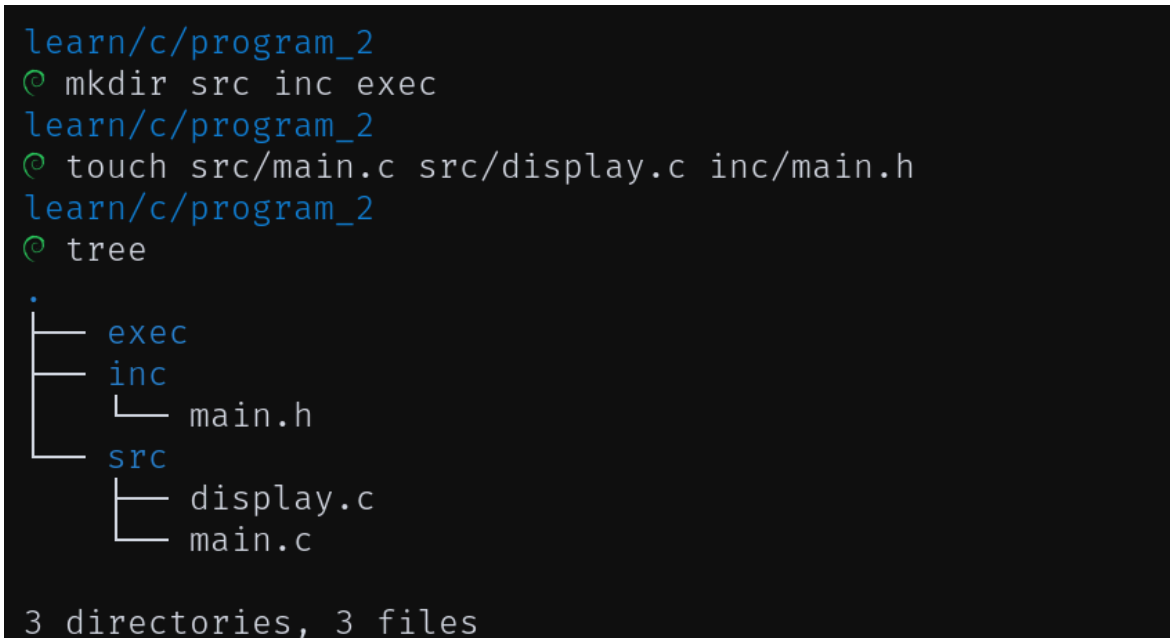
Create a C program for the below requirements

1. Create two source file main.c & display.c
2. Create a header file main.h
3. In the header file create a macro "STAGE", also by using conditional compilation for "STAGE" value as 1 & 2 define a macro for "AREA". if STAGE = 1, the AREA should have the expression for area of square, if STAGE = 2, the AREA should have the expression of area of circle.
4. In main.c create a global variable for the radius(for circle) and side (square) by using another conditional compilation
5. in display.c print the output of area in this file based on the AREA macro. the global variables should accessed as extern variable
6. share the program and output

Step 1 . Created the directory structure using following command

mkdir src inc exec && touch src/main.c src/display.c inc/main.h



Step 2. code inside `main.h`

```
// Conditional compilation based on STAGE macro
#if STAGE == 1
  #define AREA(side) ((side) * (side))  // Area of square
#elif STAGE == 2
  #define AREA(radius) (3.14159 * (radius) * (radius))  // Area of circle
```

```
#else
  #error "STAGE must be 1 (square) or 2 (circle)"
#endif
```

Step 3. code inside `display.c`

```
#include "main.h"
#include <stdio.h>

// Conditional compilation based on STAGE macro
#if STAGE == 1
  extern int side_g;  // Access the global variable from main.c
#elif STAGE == 2
  extern float radius_g;  // Access the global variable from main.c
#endif

void display_area() {

  // Conditional compilation based on STAGE macro
  #if STAGE == 1
    printf("The area of the square is: %d\n", AREA(side_g));
  #elif STAGE == 2
    printf("The area of the circle is: %.2f\n", AREA(radius_g));
  #endif

}
```

Step 4. code inside `main.c`

```
// main.c
#include "main.h"
#include <stdio.h>
```

```
extern void display_area();

// Conditional compilation based on STAGE macro
#if STAGE == 1
  int side_g;  // Global variable for square side length
#elif STAGE == 2
  float radius_g;  // Global variable for circle radius
#endif

int main() {

  // Conditional compilation based on STAGE macro
  #if STAGE == 1
     printf("Enter the side length of the square: ");
     scanf("%d", &side_g);
  #elif STAGE == 2
     printf("Enter the radius of the circle: ");
     scanf("%f", &radius_g);
  #endif

  // Call the display function to print the area
  display_area();

  return 0;
}
```

Step 5 . Compiling

Compile with STAGE = 1

```
gcc -Wall -D STAGE=1 -o exec/program -iquote ./inc/ src/main.c
src/display.c
```

or, Compile with STAGE = 2

gcc -Wall -D STAGE=2 -o exec/program -iquote ./inc/ src/main.c src/display.c

Step 6. Running the program

./exec/program

Output

```
learn/c/program_2
 gcc -Wall -D STAGE=1 -o exec/program -iquote ./inc/ src/main.c src/display.c
learn/c/program_2
 ./exec/program
Enter the side length of the square: 4
The area of the square is: 16
```

```
learn/c/program_2
 gcc -Wall -D STAGE=2 -o exec/program -iquote ./inc/ src/main.c src/display.c
learn/c/program_2
 ./exec/program
Enter the radius of the circle: 4
The area of the circle is: 50.27
```