# CI for Applied SDLC and Testing

**Abstract**: The aim of the program is to develop a program that is capable of accepting a user input for corresponding shapes, and returning the perimeter and area of the same. For each shape, once selected, will require the user to enter the required parameters or measurements for calculation. Furthermore, the code is made to undergo unit testing with suitable test cases.

### High Level Requirements

a. Should offer user the option to choose the polygon.
b. Should include all the basic shapes and polygons.
c. Should provide area and perimeter.

### Low Level Requirements

d. Should accept one parameter for square side.
e. Should accept two parameters for rectangle length and breadth.
f. Should accept three parameters for triangle sides.
g. Should accept one parameter for circle radius.
h. Should have separate functions to calculate perimeter of each shape/polygon.
i. Should have separate functions to calculate area of each shape/polygon.

### UML diagram

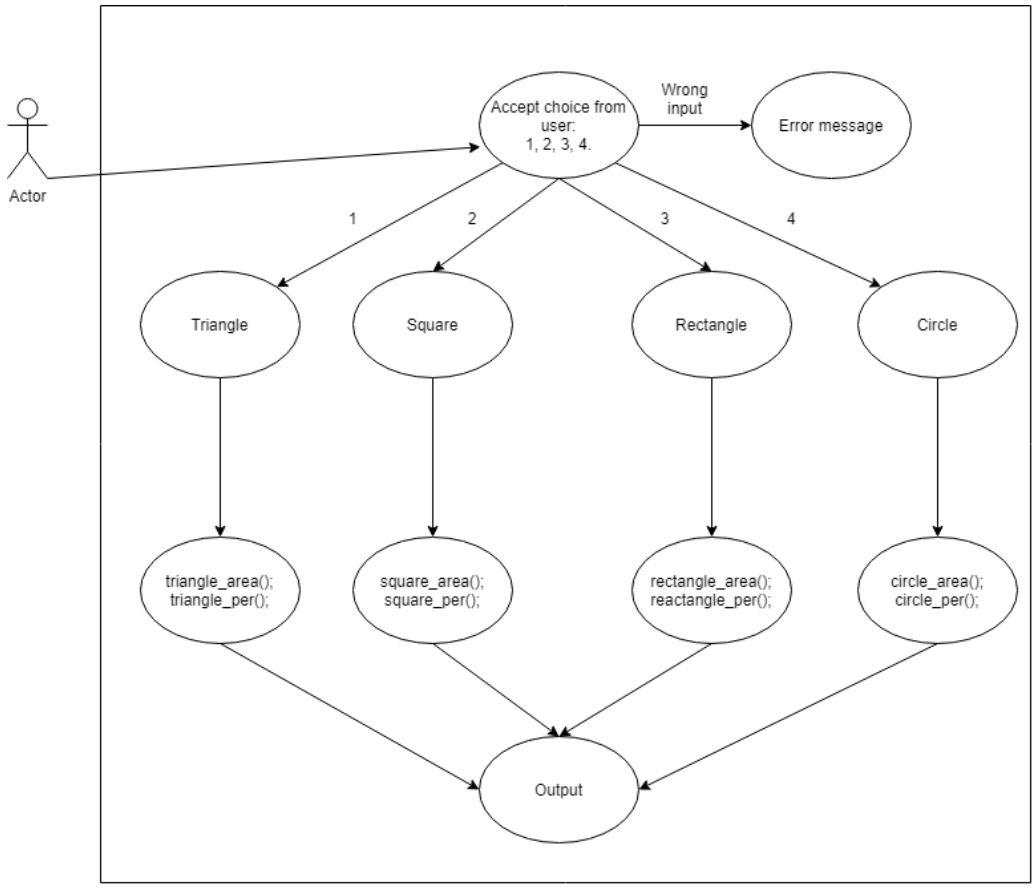



**Figure 1 : Use case diagram of program**

Test plans

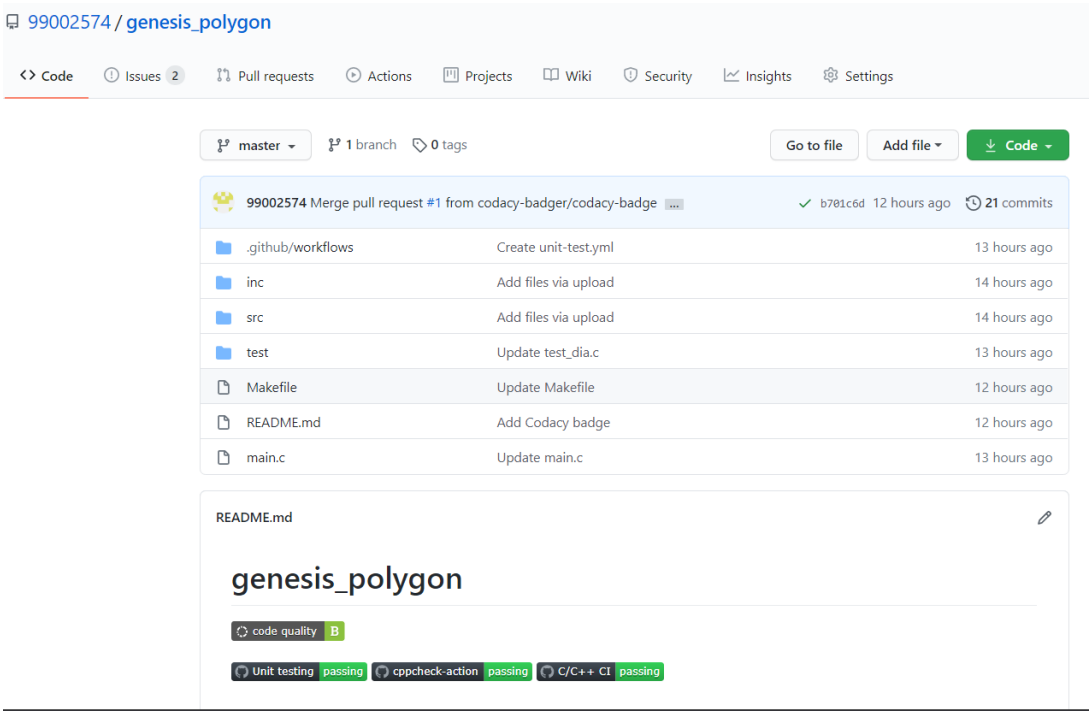
| Priority ID | Description | Precondition | Expected input | Expected output | Actual output |
|---|---|---|---|---|---|
| 1. | triangle_area (10,10,10); | Availability of function statements. | P1=10, P2=10, P3=10 | 43 | 43 |
| 2. | triangle_per (3,4,5); | | P1=3, P2=4, P3=5 | 12 | 12 |
| 3. | square_area (5); | | P1=5 | 25 | 25 |
| 4. | square_per (8) | | P1=8 | 32 | 32 |
| 5. | rectangle_area (10,5) | | P1=10, P2=5 | 50 | 50 |
| 6. | rectangle_per (10,15) | | P1=10, P2=15 | 50 | 50 |
| 7. | circle_area (10) | | P1=10 | 314 | 314 |
| 8. | circle_per (5) | | P1=5 | 31 | 31 |

**GitHub repository for the system:**

https://github.com/99002574/genesis_polygon

**Screenshot**

1. GitHub Repo



## 2. Code for MAIN.C

master ▾ genesis_polygon / main.c Go to file ⋯

99002574 Update main.c ✕ Latest commit a80120c 13 hours ago History

1 contributor

35 lines (31 sloc) | 908 Bytes Raw Blame

```c
#include <dia.h>
int main(){

int inp, tr1,tr2,tr3, leng,bre,rad,sq_side;
float tri_area, tri_per, rect_area, rect_per, cir_per, cir_area,sq_area,sq_per;
//printf("For Triangle #1\n    Rectangle #2\n    Cricle #3 ");
scanf("%d",&inp);
if(inp==1) {
        scanf("%d",&tr1);
        scanf("%d",&tr2);
        scanf("%d",&tr3);
        tri_area=triangle_area(tr1,tr2,tr3);
        tri_per=triangle_per(tr1,tr2,tr3);
        }

else if (inp==2) {
        scanf("%d",&sq_side);
        sq_area=square_area(sq_side);
        sq_per=square_per(sq_side);
        }
else if (inp==3){
        scanf("%d",&leng);
        scanf("%d",&bre);


        rect_area=rectangle_area(leng,bre);
        rect_per=rectangle_per(leng,bre);
}
else if (inp==4){
        scanf("%d",&rad);
        cir_area=circle_area(rad);
        cir_per=circle_per(rad);
        }

else printf("\nWrong input");

}
```

## 3. Code for source /src/dia.c

master ▾ genesis_polygon / src / dia.c Go to file ⋯

99002574 Add files via upload Latest commit 37aaf1d 14 hours ago History

1 contributor

23 lines (22 sloc) | 576 Bytes Raw Blame

```c
#include<dia.h>
#include<math.h>

int avgSide=0;
int triangle_area(int p1, int p2, int p3){
    avgSide=(p1+p2+p3)/3;
    return sqrt(avgSide*(avgSide-p1)*(avgSide-p2)*(avgSide-p3));
    }
int triangle_per(int p1, int p2, int p3){
    return p1+p2+p3;
    }
int square_area(int p1)
    {return p1*p1;}
int square_per(int p1)
    {return 4*p1;}
int rectangle_area(int p1, int p2)
    {return p1*p2;}
int rectangle_per(int p1, int p2)
    {return 2*p1+2*p2;}
int circle_area(int p1)
    {return 3.14*p1*p1;}
int circle_per(int p1)
    {return 2*3.14*p1;}
```

## 4. Code for header /inc/dia.h

master ▾ genesis_polygon / inc / dia.h Go to file ⋯

99002574 Add files via upload Latest commit 37aaf1d 14 hours ago History

1 contributor

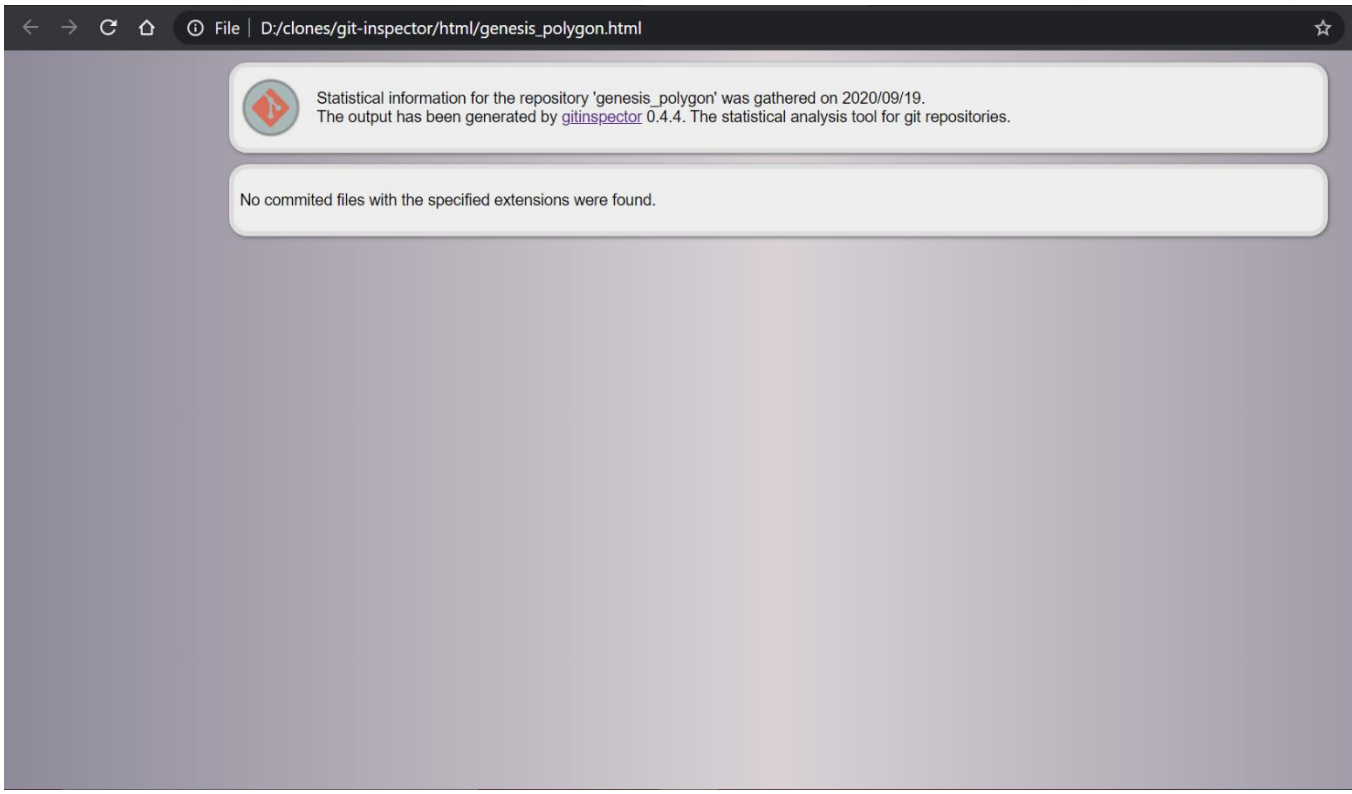
15 lines (12 sloc) | 375 Bytes Raw Blame

```c
#ifndef DIA_H_INCLUDED
#define DIA_H_INCLUDED

#include<stdio.h>
int triangle_area(int op1, int op2, int op3);
int triangle_per(int op1, int op2, int op3);
int square_area(int op1);
int square_per(int op1);
int rectangle_area(int op1, int op2);
int rectangle_per(int op1, int op2);
int circle_area(int op1);
int circle_per(int op2);


#endif // DIA_H_INCLUDED
```

## 5. Git-inspector (Error faced and conveyed on Yammer)




**User stories**

"I need a program that helps me with the perimeter of land area that I own in various standard shapes."

"I need a program that helps to calculate the area of shapes for school children."

"I am looking for an app that tells me how big an area is based on the shape, to plan for interior decoration."