

TACHE 6

Partie 1 :

1-Code source de la fonction calcul distance point segment

```
50 double distance_point_segment(Point P, Point A, Point B){
51     double dist=0;
52     //Cas 1
53     if ((A.x==B.x) && (A.y==B.y)){
54         dist=distance_point(A, P);}
55
56     //Cas 2
57     else{
58         Vecteur AB=vect_bipoint(A,B);
59         Vecteur AP=vect_bipoint(A,P);
60         double pro_scal_AB= produit_scalaire (AB, AB);
61         double pro_scal_AP= produit_scalaire (AP, AB);
62
63         double landa= pro_scal_AP / pro_scal_AB;
64
65         if (landa<0){
66             dist=distance_point(A, P);}
67
68         else if ((landa >= 0 ) && (landa <= 1)){
69             Point W= sub_point(B,A);
70             Point H= produit_reel_point(W, landa);
71             Point Q= add_point(A,H);
72             dist= distance_point(Q, P);
73         }
74
75         else if (landa > 1){
76             dist=distance_point(B, P);}
77
78     }
79     return dist;
80 }
81
```

2-le code source C du programme test

```
1#include "geom2d.h"
2#include <stdio.h>
3
4int main(int argc, char *argv[]) {
5    if(argc!=1) {
6        printf("Faux nombre d'arguments\n");
7        return 0;
8    }
9
10    Point P,A,B;
11    double x=0;
12    double y=0;
13
14
15    printf("Entrez P.x \n");
16    scanf("%lf",&x);
17    printf("Entrez P.y \n");
18    scanf("%lf",&y);
19    P = set_point(x,y);
20    printf("P: %lf, %lf;\n", P.x, P.y);
21
22
23
24
25    printf("Entrez A.x \n");
26    scanf("%lf",&x);
27    printf("Entrez A.y \n");
28    scanf("%lf",&y);
29    A = set_point(x,y);
30    printf("A: %lf, %lf;\n", A.x, A.y);
31
32
33
34    printf("Entrez B.x \n");
35    scanf("%lf",&x);
36    printf("Entrez B.y \n");
37    scanf("%lf",&y);
38    B = set_point(x,y);
39    printf("B: %lf, %lf;\n", B.x, B.y);
40
41
42
43    double dist= distance_point_segment(P, A, B);
44    printf("distance entre le point P et le segment AB: %lf .\n", dist);
45
46    printf("attendu: %lf .\n", distance_point(A, P));
47 }
```

-Jeu de test :

- cas $A = B$:

```
Entrez P.x
5
Entrez P.y
6
P: 5.000000, 6.000000;
Entrez A.x
1
Entrez A.y
2
A: 1.000000, 2.000000;
Entrez B.x
1
Entrez B.y
2
B: 1.000000, 2.000000;
distance entre le point P et le segment AB: 5.656854 .
attendu: 5.656854 .
```

- cas $A \neq B$:

```
Entrez P.x
5
Entrez P.y
6
P: 5.000000, 6.000000;
Entrez A.x
1
Entrez A.y
2
A: 1.000000, 2.000000;
Entrez B.x
3
Entrez B.y
4
B: 3.000000, 4.000000;
distance entre le point P et le segment AB: 4.242641 .
```

```
Entrez P.x
4
Entrez P.y
3
P: 4.000000, 3.000000;
Entrez A.x
5
Entrez A.y
2
A: 5.000000, 2.000000;
Entrez B.x
1
Entrez B.y
1
B: 1.000000, 1.000000;
distance entre le point P et le segment AB: 3.605551 .
```

