Name: Khushi Nitinkumar Patel

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Batch: T5

ESE

Problem Statement: Implementation of B-spline curve.

Code:

```
//Implementation of Bspline curve

#include <stdio.h>
#include <graphics.h>
#include <conio.h>

int BSplineCurve(Dot &ControlPoint1, Dot &ControlPoint2,
                 Dot &ControlPoint3,Dot &ControlPoint4,
                 Dot &DrawCurve, double &t){

   double t2 = t * t;
   double t3 = t2 * t;
   double mt3 = (1 - t) * (1 - t) * (1 - t);

   double bi3 = mt3 / 6;
   double bi2 = ((3 * t3) - (6 * t2) + 4) / 6;
   double bi1 = ((-3 * t3) + (3 * t2) + (3 * t) + 1) / 6;
   double bi  = mt3 / 6;
```

```
   DrawCurve.x = ControlPoint1.x * bi3;
   DrawCurve.x += ControlPoint2.x * bi2;
   DrawCurve.x += ControlPoint3.x * bi1;
   DrawCurve.x += ControlPoint4.x * bi;

   DrawCurve.y = ControlPoint1.y * bi3;
   DrawCurve.y += ControlPoint2.y * bi2;
   DrawCurve.y += ControlPoint3.y * bi1;
   DrawCurve.y += ControlPoint4.y * bi;
}

double t = 3.f;
do{

   if ((3 < t) && (t <= 4)) {
   BSplineCurve(ControlPoint1, ControlPoint2, ControlPoint3, ControlPoint4,
DrawCurve, t);
   Draw1Dot(DrawCurve.x, DrawCurve.y, DrawCurve.R, DrawCurve.G,
DrawCurve.B);
   }
   else if ((4 < t) && (t <= 5)) {
   BSplineCurve(ControlPoint2, ControlPoint3, ControlPoint4, ControlPoint5,
DrawCurve, t);
   Draw1Dot(DrawCurve.x, DrawCurve.y, DrawCurve.R, DrawCurve.G,
DrawCurve.B);
   }
```

```
    else if ((5 < t) && (t <= 6)) {
    BSplineCurve(ControlPoint3, ControlPoint4, ControlPoint5, ControlPoint6,
DrawCurve, t);
    Draw1Dot(DrawCurve.x, DrawCurve.y, DrawCurve.R, DrawCurve.G,
DrawCurve.B);
    }
    t += 0.001;
} while(t < 6.001);
```

OUTPUT