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Algorithm for Optimization

Practical No.4

AIM: Implement Quadratic Fit Search

1. Code for Function Creation:

```
function f(x)
return x*x-x+1
end
```

```
julia> function f(x)
       return x*x-x+1
       end
f (generic function with 1 method)
```

2. Code for Algorithm:

```
function quadratic_fit_search(f, a, b, c, n)
ya, yb, yc = f(a), f(b), f(c)
for i in 1:n-3
print(a,"\n",b,"\n",c,"\n")
x = 0.5*(ya*(b^2-c^2)+yb*(c^2-a^2)+yc*(a^2-b^2)) /
(ya*(b-c) +yb*(c-a) +yc*(a-b))
yx = f(x)
if x > b
if yx > yb
c, yc = x, yx
else
a, ya, b, yb = b, yb, x, yx
end
elseif x < b
if yx > yb
a, ya = x, yx
else
c, yc, b, yb = b, yb, x, yx
```

end

end

end

return (a, b, c)

end

```
julia> function quadratic_fit_search(f, a, b, c, n)
       ya, yb, yc = f(a), f(b), f(c)
       for i in 1:n-3
       print(a,"\n",b,"\n",c,"\n")
       x = 0.5*(ya*(b^2-c^2)+yb*(c^2-a^2)+yc*(a^2-b^2)) /
       (ya*(b-c) +yb*(c-a) +yc*(a-b))
       yx = f(x)
       if x > b
       if yx > yb
       c, yc = x, yx
       else
       a, ya, b, yb = b, yb, x, yx
       end
       elseif x < b
       if yx > yb
       a, ya = x, yx
       else
       c, yc, b, yb = b, yb, x, yx
       end
       end
       end
       return (a, b, c)
       end
quadratic_fit_search (generic function with 1 method)
```

3. Output For Code:

quadratic_fit_search(f,2,3,4,5)

```
julia> quadratic_fit_search(f,2,3,4,5)
2
3
4
2
0.5
3
(2, 0.5, 3)
```