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Algorithm for Optimization

Practical No.3

AIM: Implement Golden section 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 golden_section_search(f, a, b, n)
ρ = 1.618-1
d = ρ * b + (1 - ρ)*a
yd = f(d)
for i = 1 : n-1
print(a,"\n")
print(b,"\n")
c = ρ*a + (1 - ρ)*b
yc = f(c)
if yc < yd
b, d, yd = d, c, yc
else
a, b = b, c
end
end
return a < b ? (a, b) : (b, a)
end
```

```
julia> function golden_section_search(f, a, b, n)
       Ï = 1.618-1
       d = Ï * b + (1 - Ï)*a
       yd = f(d)
       for i = 1 : n-1
       print(a,"\n")
       print(b,"\n")
       c = Ï*a + (1 - Ï)*b
       yc = f(c)
       if yc < yd
       b, d, yd = d, c, yc
       else
       a, b = b, c
       end
       end
       return a < b ? (a, b) : (b, a)
       end
golden_section_search (generic function with 1 method)
```

3. Output For Code:

golden_section_search(f,2,3,5)

```
julia> golden_section_search(f,2,3,5)
2
3
2
2.6180000000000003
2
2.3819999999999997
2
2.2360759999999997
(2, 2.145924)
```