

Ek.3. Çeşitli Algoritma Örnekleri

1) Algoritma: Sonlu bir dizideki en büyük elemanı bulan Algoritma

```

procedure max ( $a_1, a_2, \dots, a_n$  : integers )
   $\text{max} := a_1$ 
  for  $i := 2$  to  $n$ 
    if  $\text{max} < a_i$  then  $\text{max} := a_i$ 
  { max en büyük eleman }

```

2) Algoritma: Euclidean Algoritma

```

procedure gcd( $a, b$  : positive integers )
   $x := a$ 
   $y := b$ 
  while  $y \neq 0$ 
  begin
     $r := x \bmod y$ 
     $x := y$ 
     $y := r$ 
  end { gcd (  $a, b$  ) is  $x$  }

```

3) Algoritma : Constructing Base b Expansions

```

procedure base  $b$  expansion ( $n$  : positive integer )
   $q := n$ 
   $k := 0$ 
  while  $q \neq 0$ 
  begin
     $a_k := q \bmod b$ 
     $q := \lfloor q / b \rfloor$ 
     $k := k + 1$ 
  end { the base  $b$  expansion of  $n$  is (  $a_{k-1} \dots a_1 a_0$  ) $_b$  }

```

4) Algoritma:Tamsayıların toplamı

```

procedure add( $a, b$  : positive integer )
  { the binary expansions of  $a$  and  $b$  are (  $a_{n-1}, a_{n-2}, \dots, a_1 a_0$  ) $_2$ 
    and (  $b_{n-1}, b_{n-2}, \dots, b_1 b_0$  ) $_2$ , respectively }
   $c := 0$ 
  for  $j := 0$  to  $n - 1$ 
  begin
     $d := \lfloor (a_j + b_j + c) / 2 \rfloor$ 
     $s_j := a_j + b_j + c - 2d$ 
     $c := d$ 
  end
   $s_n := c$ 
  { the binary expansion of the sum is (  $s_n s_{n-1} \dots s_0$  ) $_2$  }

```

5) Algoritma: Tamsayıların çarpımı

```

procedure multiply( $a, b$  : positive integer )
{ the binary expansions of  $a$  and  $b$  are (  $a_{n-1}, a_{n-2}, \dots, a_1 a_0$  )2
  and (  $b_{n-1}, b_{n-2}, \dots, b_1 b_0$  )2, respectively }
for  $j := 0$  to  $n - 1$ 
begin
  if  $b_j := 1$  then  $c_j := a$  shifted  $j$  places
  else  $c_j := 0$ 
end
{  $c_0, c_1, \dots, c_{n-1}$  are the partial products }
 $p := 0$ 
{  $p$  is the value of  $a.b$  }

```

6) Algoritma: Matris çarpımı

```

procedure matrix multiplication( $A, B$  : matrices )
for  $i := 1$  to  $m$ 
begin
  for  $j := 1$  to  $n$ 
  begin
     $c_{ij} := 0$ 
    for  $q := 1$  to  $k$ 
       $c_{ij} := c_{ij} + a_{iq} b_{qj}$ 
    end
  end {  $C = [c_{ij}]$  is the product of  $A$  and  $B$  }

```

7) Algoritma: Boolean çarpımı

```

procedure Boolean Product ( $A, B$  : zero-one matrices )
for  $i := 1$  to  $m$ 
begin
  for  $j := 1$  to  $n$ 
  begin
     $c_{ij} := 0$ 
    for  $q := 1$  to  $k$ 
       $c_{ij} := c_{ij} \vee a_{iq} \wedge b_{qj}$ 
    end
  end {  $C = [c_{ij}]$  is the Boolean product of  $A$  and  $B$  }

```