# Tutorial - 7

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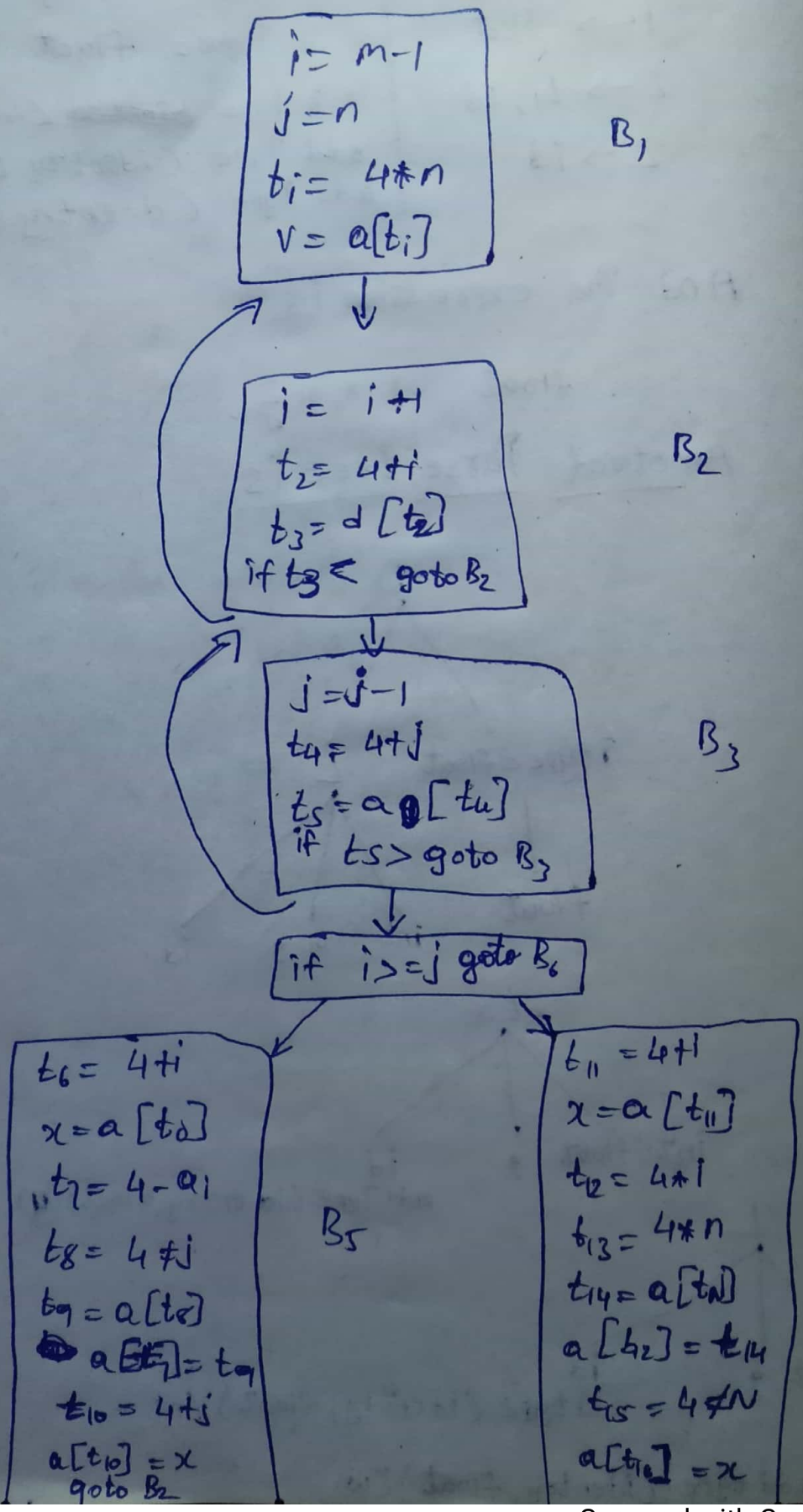
1) Flow graph

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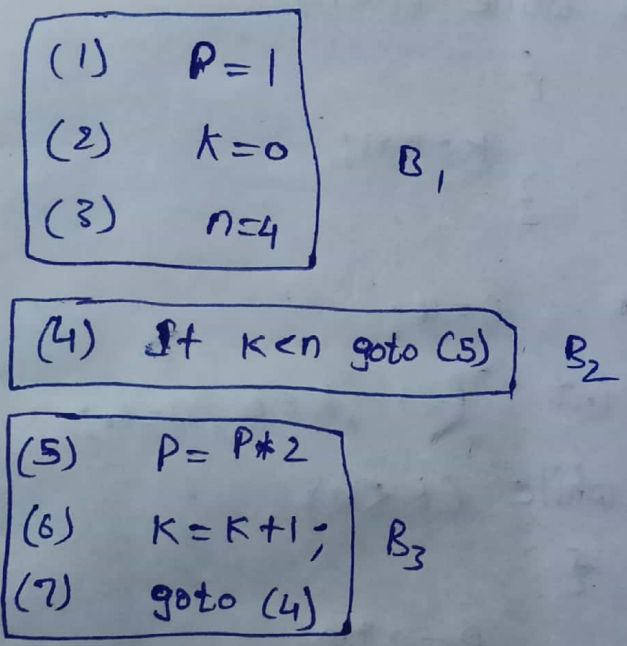
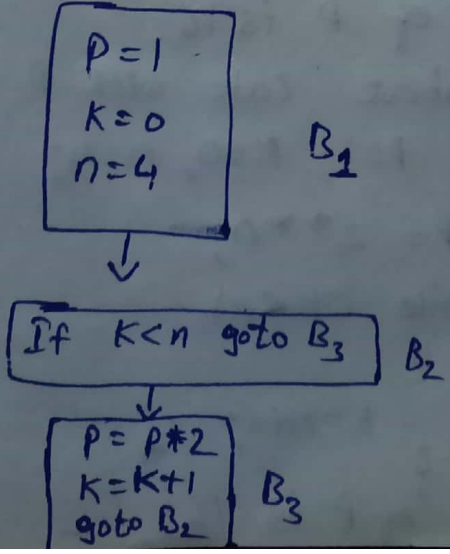
2) 
```
int P=1, K=0, n;
while (K<n)
{
    P = 2*P;
    K = K+1;
}
```

a) 3- address instructions of above code




b) Flow graph :-

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c) indentify and eliminate loop

P is not beging modified from the loop

If is a loop invariant variable and can be placed outside the loop. The modicfied Program is:

```
Int   P=1 , n, K=0;
      P= 2**n;
      while (K<n)
        {
          K=K+1;
        }
```

d) consider n=4;

```
int  P=1 , K=0 , n=4;
while (K<n)
 {
     P= 2*P
     K= K+1 ;
 }
```

The value of P is 16.

Replacing the above code with P outside the loop

```
int   P=1, K=0, n=4;
      P= 2**n;
     while (K<n)
       {
         K=K+1;
       }
```

The value of P is 16.

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