L'ASSEMBLEUR – PARTIE 2

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Traduire un if ... else ...

```
int a,b,c

main()

{
a=10;b=20;
if(a>b)c=a else c=b+3;
c=c-b;
}
```

Traduction en assembleur ARM

```
L1:
.word a
.word b
.word c
.comm a,4,4
.comm b,4,4
.comm c,4,4

mov r0,#10
ldr r1,L1
str r1,[r0]
move r0,#20
ldr r1,L1+4
str r1,[r0]

ldr r0,L1
ldr r1,[r0]
ldr r0,L1+4
ldr r2,[r0]
cmp r1,r2
ble else
ldr r0,L1
ldr r1,[r0]
ldr r0,L1+8
str r1,[r0]

bra fin_if
else : ldr r0,L1+4
ldr r1,[r0]

add r1,r1,#3
ldr r0,L1+8
str r1,[r0]
fin_if: ldr r0,L1+8
ldr r1,[r0]
ldr r2,L1+4
ldr r3,[r2]
sub r1,r1,r3
str r1,[r0]
```

Exercice : traduire en assembleur ARM

```
int a,b,c,d;

main()
{a=5;b=9;
if(b<a+3)c=a+b; else {c=b-a;a=a+1;}
d=c+b+90;
}
```

Solution

```
L1:
.word a
.word b
.word c
.word d
.comm a,4,4
.comm b,4,4
.comm c,4,4
.comm d,4,4

mov r0,#5
ldr r1,L1
str r0,[r1]
mov r0,#9
ldr r1,L1+4
str r0,[r1]
ldr r0,L1+4
ldr r1,[r0]
ldr r0,L1
ldr r2,[r0]
add r2,r2,#3
bge else
ldr r0,L1
ldr r1,[r0]
ldr r0,L1+4
ldr r2,[r0]
add r1,r1,r2
ldr r0,L1+8
str r1,[r0]
bra fin
ldr r0,L1+4
ldr r1,[r0]
ldr r0,L1
ldr r2,[r0]

sub r1,r1,r2
ldr r0,L1+8
str r1,[r0]
ldr r0,L1
ldr r1,[r0]
add r1,r1,#1
str r1,[r0]
fin: ldr r0,L1+8
ldr r1,[r0]
ldr r0,L1+4
ldr r2,[r0]
add r1,r1,r2
add r1,r1,#90
ldr r0,L1+12
str r1,[r0]
```

Traduire un for

```
int i,s;
main()
{
s=0;
for(i=1;i<10;i++)s=s+i;
}
```

Traduction

```
L1:
.word i
.word s
mov r0,#0
ldr r1,L1+4
str r0,[r1]
mov r0,#1
ldr r1,L1
str r0,[r1]
for: ldr r0,L1
ldr r1,[r0]
cmp r1,#10
bge fin
ldr r0,L1+4
ldr r1,[r0]
ldr r2,L1
ldr r3,[r2]
add r1,r1,r3
str r3,[r0]
fin:
```

Exercice : traduire en assembleur ARM

```
int a,b,s,i;
main()
{a=1;b=2;s=0;
for(i=1;i<=12;i++)
   {
   a=a+b;
   b=b+1;
   s=s+a;
   }
}
```

Solution

```
L1:
.word a
.word b
.word s
.word i
.comm a,4,4
.comm b,4,4
.comm s,4,4
.comm i,4,4
mov r0,#1
ldr r1,L1
str r0,[r1]
mov r0,#2
ldr r1,L1+4
str r0,[r1]
mov r0,#0
ldr r1,L1+8
str r0,[r1]
mov r0,#1
ldr r1,L1+12
str r0,[r1]
for: ldr r0,L1+12
ldr r1,[r0]
cmp r1,#12
bgt fin
ldr r0,L1
ldr r1,[r0]
ldr r2,L1+4
ldr r3,[r2]
add r1,r1,r3
str r1,[r0]
ldr r0,L1+4
ldr r1,[r0]
add r1,r1,#1
str r1,[r0]
ldr r0,L1+8
ldr r1,[r0]
ldr r2,L1
ldr r3,[r2]
add r1,r1,r3
str r1,[r0]
ldr r0,L1+12
ldr r1,[r0]
add r1,r1,#1
str r1,[r0]
bra for
```

Exercice : Traduire en assembleur ARM

```
int a,b;
main()
{
a=1;b=2;
while(a<100)
    {
    b=a+b;
    a=a+b;
    }
    a=a+10;
    }
```

Solution

```
L1:
.word a
.word b
.comm a,4,4
.comm b,4,4
mov r0,#1
ldr r1,L1
str r0,[r1]
mov r0,#2
ldr r1,L1+4
str r0,[r1]
```

```
while: ldr r0,L1
ldr r1,[r0]
cmp r1,#100
bge fin
ldr r0,L1
ldr r1,[r0]
ldr r0,L1+4
ldr r2,[r0]
add r1,r1,r2
str r1,[r0]
ldr r0,L1
ldr r1,[r0]
```

```
ldr r2,L1+4
ldr r2,[r0]
add r1,r1,r2
str r1,[r0]
bra while
fin : ldr r0,L1
ldr r1,[r0]
add r1,r1,#10
str r1,[r0]
```