Report 2

Algorithm explanation

The program consists 3 main parts.

- read in the decimal number
- do the change
- output

`1.` read in

- GETC
- If it is '\r',break this part
- turn the new ASCLL mode number to real number
- else let the previous number *10,plus the new number.
- R1 store the final number

`2.` change

- (loop)let R4<-x3100 store the result of R1 & 0000 0000 0000 1111
- R1>>4
- R4++
- do the loop 4 times

`3` output

- turn the number store in R4>-x3100 to ASCLL mode
- output it
- do the loop 4 times

Important parts

pick up the last four digits of the number

```
AND R2,R1,#15
```

R1>>4

```
LD R2,trick
AND R1,R1,R2
BRz divide_over
AND R5,R5,#0
divide ADD R5,R5,#1
ADD R1,R1,#-16
BRnp divide
ADD R1,R5,#0

trick .FILL xfff0
```

turn the number to ASCLL mode

```
AND R2,R2,#0
ADD R2,R0,#-10
;if the number>10 it is ntype,or goon
BRn ntype
LD R5,ASCLL_zerod
BR goon
ntype LD R5,ASCLL_zerop
goon ADD R0,R0,R5

ASCLL_zerop .FILL x30
ASCLL_zerod .FILL x37
```

Q&A

`1.` Explain how you can convert decimal to hexadecimal

Answer:

- (loop)let R4<-x3100 store the result of R1 & 0000 0000 0000 1111
- R1>>4
- R4++
- do the loop 4 times

`2.` How you can do R1>>4, which part is it

Answer: let R1 divides 16 circularly,R5 records the dividing times,that is the result. Then let R1 equal to R5.

```
LD R2,trick
AND R1,R1,R2
BRz divide_over
AND R5,R5,#0
divide ADD R5,R5,#1
ADD R1,R1,#-16
BRnp divide
ADD R1,R5,#0
```