Assembly Code, Machine Code, and Symbol Table

Operating System Internals Homework 1

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**Assembly Code with Descriptions**

Label Mnemonic Operand Description

main function Start of main function

t int 0 Initialize int t to zero

r int 0 Initialize int r to zero

count int 100 Initialize int count to 100

addon int 1 Initialize int addon to 1

Loop Move R0,addon Move value of addon to R0

Add t,R0 Add t and R0 and store in R0

Add addon,1 Add 1 to addon

Subtract count,1 Subtract 1 from count and store in count

BrOnPlus count,Loop Branch to loop when count is positive

Move R1,t Move value of t to R1

Add r,R1 Add value of r and R1 and store in r

Add r,R1 Add value of r and R1 and store in r

Subtract r,100 Subtract 100 from r and store in r

Divide r,200 Divide r by 200 and store in r

Halt Stop executing program

End Loop Execution starts at move instruction

**Machine Code with Comments**

Address Content Comment

0 0 Initialize int t to 0

1 0 Initialize int r to 0

2 100 Initialize int count to 100

3 1 Initialize int addon to 1

4 51050 Move value of addon to R0

5 3 Address of addon

6 15010 Add t and R0 and store in t

7 0 Address of t

8 15060 Add 1 to addon

9 3 Address of addon

10 1 Immediate operand value of 1

11 25060 Subtract 1 from count and store in count

12 2 Address of count

13 1 Immediate operand value of 1

14 85000 Branch to loop when count is positive

15 2 Address of count

16 4 Address of move command

17 51150 Move value of t to R1

18 0 Address of t

19 15011 Add value of R1 and r and store in r

20 1 Address of r

21 15011 Add value of R1 and r and store in r

22 1 Address of r

23 25060 Subtract 100 from r and store in r

24 1 Address of r

25 100 Immediate operand value of 100

26 45060 Divide r by 200 and store in r

27 1 Address of r

28 200 Immediate operand value of 200

29 0 Halt

-1 4 End of Program

**Symbol Table**

|  |  |
| --- | --- |
| **Symbol** | **Address** |
| main | 0 |
| t | 0 |
| r | 1 |
| count | 2 |
| addon | 3 |
| Loop | 4 |