

```

uint32_t system_time;

int foo(char a, uint16_t b, int c);

ISR(TIMERO_OVF_vect) {
    system_time++;
}

int main(void){
    system_time = 0;
    TIMSK0 |= (1<<TOIE0);
    TCCR0B |= (1<<CS00);
    sei();
    uint32_t l;
    l = 243;
    uint8_t k;
    k = 32;
    uint16_t i;
    i = 100;
    int j;
    j=300;
    foo(1,i,j);
    while(1){}
}

int foo(char a, uint16_t b, int c){
    int x,y,z;
    x=a+c;
    y=c-a;
    z=x+y;
    return z;
}

```

| | |
|--|--------|
| | 0x10FF |
| | 0x10FE |
| | 0x10FD |
| | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

00000038 CLR R1
00000039 OUT 0x3F, R1
0000003A SER R28
0000003B LDI R29, 0x10
0000003C OUT 0x3E, R29
0000003D OUT 0x3D, R28
0000003E LDI R18, 0x01
0000003F LDI R26, 0x00
00000040 LDI R27, 0x01
00000041 RJMP PC+0x0002
00000042 ST X+, R1
00000043 CPI R26, 0x04
00000044 CPC R27, R18
00000045 BRNE PC-0x03
00000046 RCALL PC+0x0030
00000047 RJMP PC+0x00A5
00000048 RJMP PC-0x0048

```

| | |
|---------------|--|
| SP(0x3D:0x3E) | |
| Y (R28:0x29) | |

Y →

| | |
|--|--------|
| | 0x10FF |
| | 0x10FE |
| | 0x10FD |
| | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

00000038 CLR R1
00000039 OUT 0x3F, R1
0000003A SER R28
0000003B LDI R29, 0x10
0000003C OUT 0x3E, R29
0000003D OUT 0x3D, R28
0000003E LDI R18, 0x01
0000003F LDI R26, 0x00
00000040 LDI R27, 0x01
00000041 RJMP PC+0x0002
00000042 ST X+, R1
00000043 CPI R26, 0x04
00000044 CPC R27, R18
00000045 BRNE PC-0x03
00000046 RCALL PC+0x0030
00000047 RJMP PC+0x00A5
00000048 RJMP PC-0x0048

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | |
| Y (R28:0x29) | 0x10FF |

SP  Y 

| | |
|--|--------|
| | 0x10FF |
| | 0x10FE |
| | 0x10FD |
| | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

00000038 CLR R1
00000039 OUT 0x3F, R1
0000003A SER R28
0000003B LDI R29, 0x10
0000003C OUT 0x3E, R29
0000003D OUT 0x3D, R28
0000003E LDI R18, 0x01
0000003F LDI R26, 0x00
00000040 LDI R27, 0x01
00000041 RJMP PC+0x0002
00000042 ST X+, R1
00000043 CPI R26, 0x04
00000044 CPC R27, R18
00000045 BRNE PC-0x03
00000046 RCALL PC+0x0030
00000047 RJMP PC+0x00A5
00000048 RJMP PC-0x0048

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10FF |
| Y (R28:0x29) | 0x10FF |

SP  Y 

| | |
|--|--------|
| | 0x10FF |
| | 0x10FE |
| | 0x10FD |
| | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

00000038 CLR R1
00000039 OUT 0x3F, R1
0000003A SER R28
0000003B LDI R29, 0x10
0000003C OUT 0x3E, R29
0000003D OUT 0x3D, R28
0000003E LDI R18, 0x01
0000003F LDI R26, 0x00
00000040 LDI R27, 0x01
00000041 RJMP PC+0x0002
00000042 ST X+, R1
00000043 CPI R26, 0x04
00000044 CPC R27, R18
00000045 BRNE PC-0x03
00000046 RCALL PC+0x0030
00000047 RJMP PC+0x00A5
00000048 RJMP PC-0x0048

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10FF |
| Y (R28:0x29) | 0x10FF |

| | | |
|------|---------|--------|
| Y → | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| SP → | | 0x10FD |
| | | 0x10FC |
| | | 0x10FB |
| | | 0x10FA |
| | | 0x10F9 |
| | | 0x10F8 |
| | | 0x10F7 |
| | | 0x10F6 |
| | | 0x10F5 |
| | | 0x10F4 |
| | | 0x10F3 |
| | | 0x10F2 |
| | | 0x10F1 |
| | | 0x10F0 |
| | | 0x10EF |
| | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

| | |
|----------|-----------------|
| 00000038 | CLR R1 |
| 00000039 | OUT 0x3F, R1 |
| 0000003A | SER R28 |
| 0000003B | LDI R29, 0x10 |
| 0000003C | OUT 0x3E, R29 |
| 0000003D | OUT 0x3D, R28 |
| 0000003E | LDI R18, 0x01 |
| 0000003F | LDI R26, 0x00 |
| 00000040 | LDI R27, 0x01 |
| 00000041 | RJMP PC+0x0002 |
| 00000042 | ST X+, R1 |
| 00000043 | CPI R26, 0x04 |
| 00000044 | CPC R27, R18 |
| 00000045 | BRNE PC-0x03 |
| 00000046 | RCALL PC+0x0030 |
| 00000047 | RJMP PC+0x00A5 |
| 00000048 | RJMP PC-0x0048 |

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10FD |
| Y (R28:0x29) | 0x10FF |

| | | |
|------|---------|--------|
| Y → | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| SP → | | 0x10FB |
| | | 0x10FA |
| | | 0x10F9 |
| | | 0x10F8 |
| | | 0x10F7 |
| | | 0x10F6 |
| | | 0x10F5 |
| | | 0x10F4 |
| | | 0x10F3 |
| | | 0x10F2 |
| | | 0x10F1 |
| | | 0x10F0 |
| | | 0x10EF |
| | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

int main(void) {
00000076  PUSH R28
00000077  PUSH R29
00000078  IN  R28, 0x3D
00000079  IN  R29, 0x3E
0000007A  SBIW R28, 0x09
0000007B  IN  R0, 0x3F
0000007C  CLI
0000007D  OUT 0x3E, R29
0000007E  OUT 0x3F, R0
0000007F  OUT 0x3D, R28

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10FB |
| Y (R28:0x29) | 0x10FF |

Y → SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

int main(void) {
00000076  PUSH R28
00000077  PUSH R29
00000078  IN R28, 0x3D
00000079  IN R29, 0x3E
0000007A  SBIW R28, 0x09
0000007B  IN R0, 0x3F
0000007C  CLI
0000007D  OUT 0x3E, R29
0000007E  OUT 0x3F, R0
0000007F  OUT 0x3D, R28

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10FB |
| Y (R28:0x29) | 0x10FB |

SP →

Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

int main(void) {
00000076  PUSH R28
00000077  PUSH R29
00000078  IN R28, 0x3D
00000079  IN R29, 0x3E
0000007A  SBIW R28, 0x09
0000007B  IN R0, 0x3F
0000007C  CLI
0000007D  OUT 0x3E, R29
0000007E  OUT 0x3F, R0
0000007F  OUT 0x3D, R28

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10FB |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

int main(void) {
00000076  PUSH R28
00000077  PUSH R29
00000078  IN R28, 0x3D
00000079  IN R29, 0x3E
0000007A  SBIW R28, 0x09
0000007B  IN R0, 0x3F
0000007C  CLI
0000007D  OUT 0x3E, R29
0000007E  OUT 0x3F, R0
0000007F  OUT 0x3D, R28

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

system_time = 0;

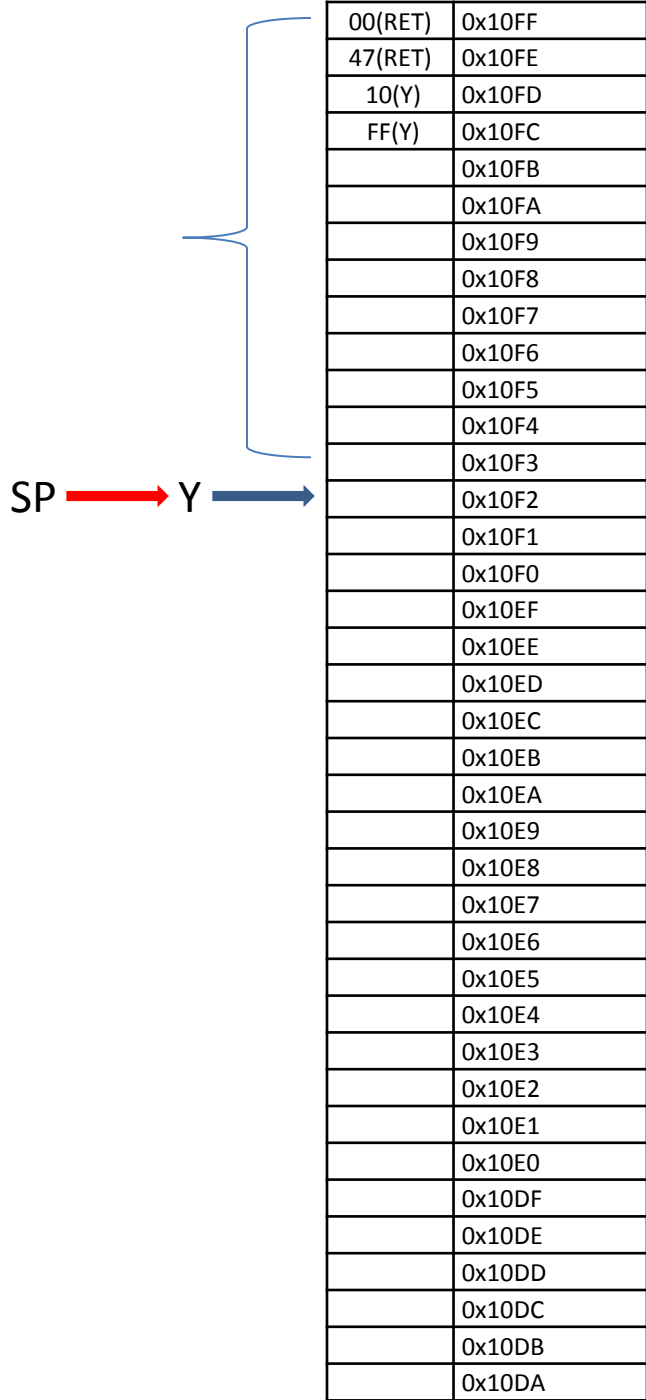
00000080 STS 0x0100, R1

00000082 STS 0x0101, R1

00000084 STS 0x0102, R1

00000086 STS 0x0103, R1

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |



```

I = 243;
0000009B  LDI R24, 0xF3
0000009C  LDI R25, 0x00
0000009D  LDI R26, 0x00
0000009E  LDI R27, 0x00
0000009F  STD Y+1, R24
000000A0  STD Y+2, R25
000000A1  STD Y+3, R26
000000A2  STD Y+4, R27
  
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| 00(I) | 0x10F6 |
| 00(I) | 0x10F5 |
| 00(I) | 0x10F4 |
| F3 (I) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

I = 243;

```

0000009B LDI R24, 0xF3
0000009C LDI R25, 0x00
0000009D LDI R26, 0x00
0000009E LDI R27, 0x00
0000009F STD Y+1, R24
000000A0 STD Y+2, R25
000000A1 STD Y+3, R26
000000A2 STD Y+4, R27

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

k = 32;
000000A3 LDI R24, 0x20
000000A4 STD Y+5, R24
i = 100;
000000A5 LDI R24, 0x64
000000A6 LDI R25, 0x00
000000A7 STD Y+7, R25
000000A8 STD Y+6, R24
j=300;
000000A9 LDI R24, 0x2C
000000AA LDI R25, 0x01
000000AB STD Y+9, R25
000000AC STD Y+8, R24

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

k = 32;
000000A3  LDI  R24, 0x20
000000A4  STD  Y+5, R24
i = 100;
000000A5  LDI  R24, 0x64
000000A6  LDI  R25, 0x00
000000A7  STD  Y+7, R25
000000A8  STD  Y+6, R24
j=300;
000000A9  LDI  R24, 0x2C
000000AA  LDI  R25, 0x01
000000AB  STD  Y+9, R25
000000AC  STD  Y+8, R24

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

k = 32;
000000A3  LDI  R24, 0x20
000000A4  STD  Y+5, R24
i = 100;
000000A5  LDI  R24, 0x64
000000A6  LDI  R25, 0x00
000000A7  STD  Y+7, R25
000000A8  STD  Y+6, R24
j=300;
000000A9  LDI  R24, 0x2C
000000AA  LDI  R25, 0x01
000000AB  STD  Y+9, R25
000000AC  STD  Y+8, R24

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

foo(1,i,j);

```
000000AD LDD R18, Y+8
000000AE LDD R19, Y+9
000000AF LDD R24, Y+6
000000B0 LDD R25, Y+7
000000B1 MOVW R20, R18
000000B2 MOVW R22, R24
000000B3 LDI R24, 0x01
000000B4 RCALL PC+0x0002
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

| | | |
|------|----------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| Y → | 00 (RET) | 0x10F2 |
| | B5(RET) | 0x10F1 |
| SP → | | 0x10F0 |
| | | 0x10EF |
| | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

foo(1,i,j);
000000AD  LDD R18, Y+8
000000AE  LDD R19, Y+9
000000AF  LDD R24, Y+6
000000B0  LDD R25, Y+7
000000B1  MOVW R20, R18
000000B2  MOVW R22, R24
000000B3  LDI  R24, 0x01
000000B4  RCALL PC+0x0002

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F0 |
| Y (R28:0x29) | 0x10F2 |

| | | |
|------|----------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| Y → | 00 (RET) | 0x10F2 |
| | B5(RET) | 0x10F1 |
| SP → | | 0x10F0 |
| | | 0x10EF |
| | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

int foo(char a, uint16_t b, int c){
000000B6  PUSH  R28
000000B7  PUSH  R29
000000B8  IN    R28, 0x3D
000000B9  IN    R29, 0x3E
000000BA  SBIW  R28, 0x0B
000000BB  IN    R0, 0x3F
000000BC  CLI
000000BD  OUT   0x3E, R29
000000BE  OUT   0x3F, R0
000000BF  OUT   0x3D, R28
000000C0  STD   Y+7, R24
000000C1  STD   Y+9, R23
000000C2  STD   Y+8, R22
000000C3  STD   Y+11, R21
000000C4  STD   Y+10, R20

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10EE |
| Y (R28:0x29) | 0x10F2 |

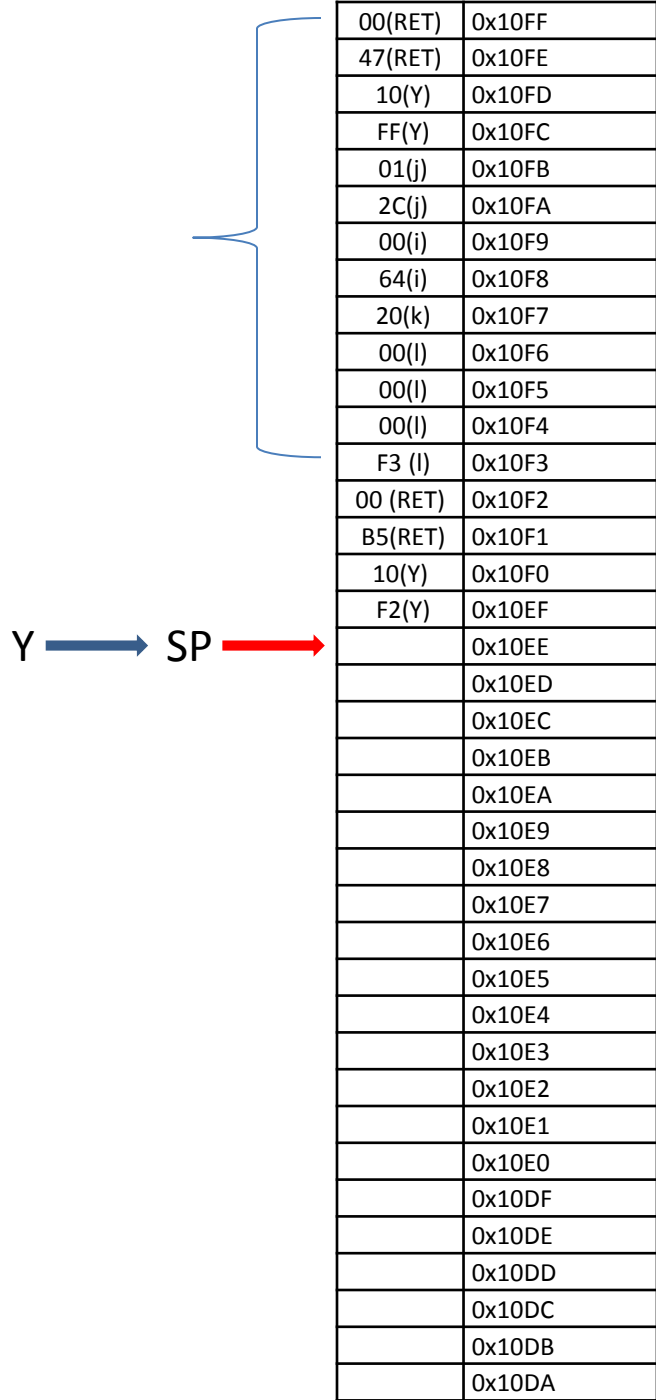
| | | |
|------|----------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| Y → | 00 (RET) | 0x10F2 |
| | B5(RET) | 0x10F1 |
| | 10(Y) | 0x10F0 |
| | F2(Y) | 0x10EF |
| SP → | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

int foo(char a, uint16_t b, int c){
000000B6  PUSH R28
000000B7  PUSH R29
000000B8  IN R28, 0x3D
000000B9  IN R29, 0x3E
000000BA  SBIW R28, 0x0B
000000BB  IN R0, 0x3F
000000BC  CLI
000000BD  OUT 0x3E, R29
000000BE  OUT 0x3F, R0
000000BF  OUT 0x3D, R28
000000C0  STD Y+7, R24
000000C1  STD Y+9, R23
000000C2  STD Y+8, R22
000000C3  STD Y+11, R21
000000C4  STD Y+10, R20

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10EE |
| Y (R28:0x29) | 0x10F2 |



```

int foo(char a, uint16_t b, int c){
000000B6  PUSH  R28
000000B7  PUSH  R29
000000B8  IN    R28, 0x3D
000000B9  IN    R29, 0x3E
000000BA  SBIW  R28, 0x0B
000000BB  IN    R0, 0x3F
000000BC  CLI
000000BD  OUT   0x3E, R29
000000BE  OUT   0x3F, R0
000000BF  OUT   0x3D, R28
000000C0  STD   Y+7, R24
000000C1  STD   Y+9, R23
000000C2  STD   Y+8, R22
000000C3  STD   Y+11, R21
000000C4  STD   Y+10, R20

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10EE |
| Y (R28:0x29) | 0x10EE |

| | | |
|------|----------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| | 00 (RET) | 0x10F2 |
| | B5(RET) | 0x10F1 |
| | 10(Y) | 0x10F0 |
| | F2(Y) | 0x10EF |
| SP → | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| Y → | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

int foo(char a, uint16_t b, int c){
000000B6  PUSH  R28
000000B7  PUSH  R29
000000B8  IN    R28, 0x3D
000000B9  IN    R29, 0x3E
000000BA  SBIW  R28, 0x0B
000000BB  IN    R0, 0x3F
000000BC  CLI
000000BD  OUT   0x3E, R29
000000BE  OUT   0x3F, R0
000000BF  OUT   0x3D, R28
000000C0  STD   Y+7, R24
000000C1  STD   Y+9, R23
000000C2  STD   Y+8, R22
000000C3  STD   Y+11, R21
000000C4  STD   Y+10, R20

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10EE |
| Y (R28:0x29) | 0x10E3 |

SP → Y →

| | |
|----------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| 00 (RET) | 0x10F2 |
| B5(RET) | 0x10F1 |
| 10(Y) | 0x10F0 |
| F2(Y) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```
int foo(char a, uint16_t b, int c){
```

```
000000B6  PUSH  R28
000000B7  PUSH  R29
000000B8  IN    R28, 0x3D
000000B9  IN    R29, 0x3E
000000BA  SBIW  R28, 0x0B
000000BB  IN    R0, 0x3F
000000BC  CLI
000000BD  OUT   0x3E, R29
000000BE  OUT   0x3F, R0
000000BF  OUT   0x3D, R28
000000C0  STD   Y+7, R24
000000C1  STD   Y+9, R23
000000C2  STD   Y+8, R22
000000C3  STD   Y+11, R21
000000C4  STD   Y+10, R20
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E3 |
| Y (R28:0x29) | 0x10E3 |

SP → Y →

| | |
|----------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| 00 (RET) | 0x10F2 |
| B5(RET) | 0x10F1 |
| 10(Y) | 0x10F0 |
| F2(Y) | 0x10EF |
| 2C(j) | 0x10EE |
| 01(j) | 0x10ED |
| 00(i) | 0x10EC |
| 64(i) | 0x10EB |
| 1(1) | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

int foo(char a, uint16_t b, int c){
000000B6  PUSH  R28
000000B7  PUSH  R29
000000B8  IN    R28, 0x3D
000000B9  IN    R29, 0x3E
000000BA  SBIW  R28, 0x0B
000000BB  IN    R0, 0x3F
000000BC  CLI
000000BD  OUT   0x3E, R29
000000BE  OUT   0x3F, R0
000000BF  OUT   0x3D, R28
000000C0  STD   Y+7, R24
000000C1  STD   Y+9, R23
000000C2  STD   Y+8, R22
000000C3  STD   Y+11, R21
000000C4  STD   Y+10, R20

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E3 |
| Y (R28:0x29) | 0x10E3 |

SP → Y →

| | |
|----------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| 00 (RET) | 0x10F2 |
| B5(RET) | 0x10F1 |
| 10(Y) | 0x10F0 |
| F2(Y) | 0x10EF |
| 2C(j) | 0x10EE |
| 01(j) | 0x10ED |
| 00(i) | 0x10EC |
| 64(i) | 0x10EB |
| 1(1) | 0x10EA |
| (z) | 0x10E9 |
| (z) | 0x10E8 |
| (y) | 0x10E7 |
| (y) | 0x10E6 |
| (x) | 0x10E5 |
| (x) | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```
x=a+c;  
y=c-a;  
z=x+y;
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E3 |
| Y (R28:0x29) | 0x10E3 |

SP → Y →

| | |
|----------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| 00 (RET) | 0x10F2 |
| B5(RET) | 0x10F1 |
| 10(Y) | 0x10F0 |
| F2(Y) | 0x10EF |
| 2C(j) | 0x10EE |
| 01(j) | 0x10ED |
| 00(i) | 0x10EC |
| 64(i) | 0x10EB |
| 1(1) | 0x10EA |
| (z) | 0x10E9 |
| (z) | 0x10E8 |
| (y) | 0x10E7 |
| (y) | 0x10E6 |
| (x) | 0x10E5 |
| (x) | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

return z;

000000E1 LDD R24, Y+5

000000E2 LDD R25, Y+6

}

000000E3 ADIW R28, 0x0B

000000E4 IN R0, 0x3F

000000E5 CLI

000000E6 OUT 0x3E, R29

000000E7 OUT 0x3F, R0

000000E8 OUT 0x3D, R28

000000E9 POP R29

000000EA POP R28

000000EB RET

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E3 |
| Y (R28:0x29) | 0x10E3 |

| | | |
|------|----------|--------|
| | 00(Ret) | 0x10FF |
| | 47(Ret) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| | 00 (Ret) | 0x10F2 |
| Y → | B5(Ret) | 0x10F1 |
| | 10(Y) | 0x10F0 |
| | F2(Y) | 0x10EF |
| | 2C(j) | 0x10EE |
| | 01(j) | 0x10ED |
| | 00(i) | 0x10EC |
| | 64(i) | 0x10EB |
| | 1(1) | 0x10EA |
| | (z) | 0x10E9 |
| | (z) | 0x10E8 |
| | (y) | 0x10E7 |
| | (y) | 0x10E6 |
| | (x) | 0x10E5 |
| | (x) | 0x10E4 |
| SP → | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

return z;
000000E1  LDD R24, Y+5
000000E2  LDD R25, Y+6
}
000000E3  ADIW R28, 0x0B
000000E4  IN R0, 0x3F
000000E5  CLI
000000E6  OUT 0x3E, R29
000000E7  OUT 0x3F, R0
000000E8  OUT 0x3D, R28
000000E9  POP R29
000000EA  POP R28
000000EB  RET

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E3 |
| Y (R28:0x29) | 0x10EE |

SP → Y →

| | |
|----------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| 00 (RET) | 0x10F2 |
| B5(RET) | 0x10F1 |
| 10(Y) | 0x10F0 |
| F2(Y) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

return z;

000000E1 LDD R24, Y+5

000000E2 LDD R25, Y+6

}

000000E3 ADIW R28, 0x0B

000000E4 IN R0, 0x3F

000000E5 CLI

000000E6 OUT 0x3E, R29

000000E7 OUT 0x3F, R0

000000E8 OUT 0x3D, R28

000000E9 POP R29

000000EA POP R28

000000EB RET

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10EE |
| Y (R28:0x29) | 0x10EE |

| | | |
|------|----------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| Y → | 00 (RET) | 0x10F2 |
| SP → | B5(RET) | 0x10F1 |
| | | 0x10F0 |
| | | 0x10EF |
| | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

return z;
000000E1  LDD R24, Y+5
000000E2  LDD R25, Y+6
}
000000E3  ADIW R28, 0x0B
000000E4  IN R0, 0x3F
000000E5  CLI
000000E6  OUT 0x3E, R29
000000E7  OUT 0x3F, R0
000000E8  OUT 0x3D, R28
000000E9  POP R29
000000EA  POP R28
000000EB  RET

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F0 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

return z;

000000E1 LDD R24, Y+5

000000E2 LDD R25, Y+6

}

000000E3 ADIW R28, 0x0B

000000E4 IN R0, 0x3F

000000E5 CLI

000000E6 OUT 0x3E, R29

000000E7 OUT 0x3F, R0

000000E8 OUT 0x3D, R28

000000E9 POP R29

000000EA POP R28

000000EB RET

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
|---------------|--------|

| | |
|--------------|--------|
| Y (R28:0x29) | 0x10F2 |
|--------------|--------|

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```
while(1){  
000000B5 RJMP PC-0x0000
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

| | | | |
|----|---|---------|--------|
| Y | } | 00(RET) | 0x10FF |
| | | 47(RET) | 0x10FE |
| | | 10(Y) | 0x10FD |
| | | FF(Y) | 0x10FC |
| | | 01(j) | 0x10FB |
| | | 2C(j) | 0x10FA |
| | | 00(i) | 0x10F9 |
| | | 64(i) | 0x10F8 |
| | | 20(k) | 0x10F7 |
| | | 00(l) | 0x10F6 |
| | | 00(l) | 0x10F5 |
| | | 00(l) | 0x10F4 |
| | | F3 (l) | 0x10F3 |
| SP | → | (RET) | 0x10F2 |
| | | (RET) | 0x10F1 |
| | | R1 | 0x10F0 |
| | | R0 | 0x10EF |
| | | SREG | 0x10EE |
| | | R24 | 0x10ED |
| | | R25 | 0x10EC |
| | | R26 | 0x10EB |
| | | R27 | 0x10EA |
| | | 10(R28) | 0x10E9 |
| | | F2(R29) | 0x10E8 |
| | | | 0x10E7 |
| | | | 0x10E6 |
| | | | 0x10E5 |
| | | | 0x10E4 |
| | | | 0x10E3 |
| | | | 0x10E2 |
| | | | 0x10E1 |
| | | | 0x10E0 |
| | | | 0x10DF |
| | | | 0x10DE |
| | | | 0x10DD |
| | | | 0x10DC |
| | | | 0x10DB |
| | | | 0x10DA |

```

ISR(TIMERO_OVF_vect) {
00000049  PUSH  R1
0000004A  PUSH  R0
0000004B  LDS   R0, 0x005F
0000004D  PUSH  R0
0000004E  CLR   R1
0000004F  PUSH  R24
00000050  PUSH  R25
00000051  PUSH  R26
00000052  PUSH  R27
00000053  PUSH  R28
00000054  PUSH  R29
00000055  IN    R28, 0x3D
00000056  IN    R29, 0x3E

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E7 |
| Y (R28:0x29) | 0x10F2 |


Y  SP 

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| (RET) | 0x10F2 |
| (RET) | 0x10F1 |
| R1 | 0x10F0 |
| R0 | 0x10EF |
| SREG | 0x10EE |
| R24 | 0x10ED |
| R25 | 0x10EC |
| R26 | 0x10EB |
| R27 | 0x10EA |
| 10(R28) | 0x10E9 |
| F2(R29) | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```
ISR(TIMERO_OVF_vect) {
00000049  PUSH  R1
0000004A  PUSH  R0
0000004B  LDS   R0, 0x005F
0000004D  PUSH  R0
0000004E  CLR   R1
0000004F  PUSH  R24
00000050  PUSH  R25
00000051  PUSH  R26
00000052  PUSH  R27
00000053  PUSH  R28
00000054  PUSH  R29
00000055  IN    R28, 0x3D
00000056  IN    R29, 0x3E
}
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E7 |
| Y (R28:0x29) | 0x10E7 |

Y  SP 

| | | |
|--|---------|--------|
|  | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| | (RET) | 0x10F2 |
| | (RET) | 0x10F1 |
| | R1 | 0x10F0 |
| | R0 | 0x10EF |
| | SREG | 0x10EE |
| | R24 | 0x10ED |
| | R25 | 0x10EC |
| | R26 | 0x10EB |
| | R27 | 0x10EA |
| | 10(R28) | 0x10E9 |
| | F2(R29) | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```
system_time++;
```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E7 |
| Y (R28:0x29) | 0x10E7 |

| | | |
|------|---------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| Y → | F3 (l) | 0x10F3 |
| | (RET) | 0x10F2 |
| | (RET) | 0x10F1 |
| | R1 | 0x10F0 |
| | R0 | 0x10EF |
| | SREG | 0x10EE |
| | R24 | 0x10ED |
| | R25 | 0x10EC |
| | R26 | 0x10EB |
| | R27 | 0x10EA |
| SP → | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

}
0000006A POP R29
0000006B POP R28
0000006C POP R27
0000006D POP R26
0000006E POP R25
0000006F POP R24
00000070 POP R0
00000071 STS 0x005F, R0
00000073 POP R0
00000074 POP R1
00000075 RETI

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10E9 |
| Y (R28:0x29) | 0x10F2 |

| | | |
|------|---------|--------|
| | 00(RET) | 0x10FF |
| | 47(RET) | 0x10FE |
| | 10(Y) | 0x10FD |
| | FF(Y) | 0x10FC |
| | 01(j) | 0x10FB |
| | 2C(j) | 0x10FA |
| | 00(i) | 0x10F9 |
| | 64(i) | 0x10F8 |
| | 20(k) | 0x10F7 |
| | 00(l) | 0x10F6 |
| | 00(l) | 0x10F5 |
| | 00(l) | 0x10F4 |
| | F3 (l) | 0x10F3 |
| Y → | (RET) | 0x10F2 |
| | (RET) | 0x10F1 |
| SP → | | 0x10F0 |
| | | 0x10EF |
| | | 0x10EE |
| | | 0x10ED |
| | | 0x10EC |
| | | 0x10EB |
| | | 0x10EA |
| | | 0x10E9 |
| | | 0x10E8 |
| | | 0x10E7 |
| | | 0x10E6 |
| | | 0x10E5 |
| | | 0x10E4 |
| | | 0x10E3 |
| | | 0x10E2 |
| | | 0x10E1 |
| | | 0x10E0 |
| | | 0x10DF |
| | | 0x10DE |
| | | 0x10DD |
| | | 0x10DC |
| | | 0x10DB |
| | | 0x10DA |

```

}
0000006A POP R29
0000006B POP R28
0000006C POP R27
0000006D POP R26
0000006E POP R25
0000006F POP R24
00000070 POP R0
00000071 STS 0x005F, R0
00000073 POP R0
00000074 POP R1
00000075 RETI

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F0 |
| Y (R28:0x29) | 0x10F2 |

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| 01(j) | 0x10FB |
| 2C(j) | 0x10FA |
| 00(i) | 0x10F9 |
| 64(i) | 0x10F8 |
| 20(k) | 0x10F7 |
| 00(l) | 0x10F6 |
| 00(l) | 0x10F5 |
| 00(l) | 0x10F4 |
| F3 (l) | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

```

}
0000006A POP R29
0000006B POP R28
0000006C POP R27
0000006D POP R26
0000006E POP R25
0000006F POP R24
00000070 POP R0
00000071 STS 0x005F, R0
00000073 POP R0
00000074 POP R1
00000075 RETI

```

| | |
|---------------|--------|
| SP(0x3D:0x3E) | 0x10F2 |
| Y (R28:0x29) | 0x10F2 |

```

uint32_t system_time;

int foo(char a, uint16_t b, int c);

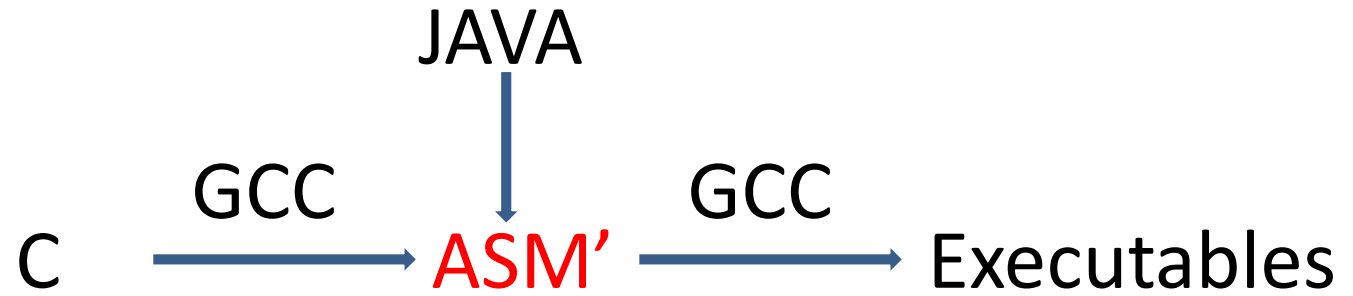
ISR(TIMER0_OVF_vect) {
    system_time++;
}

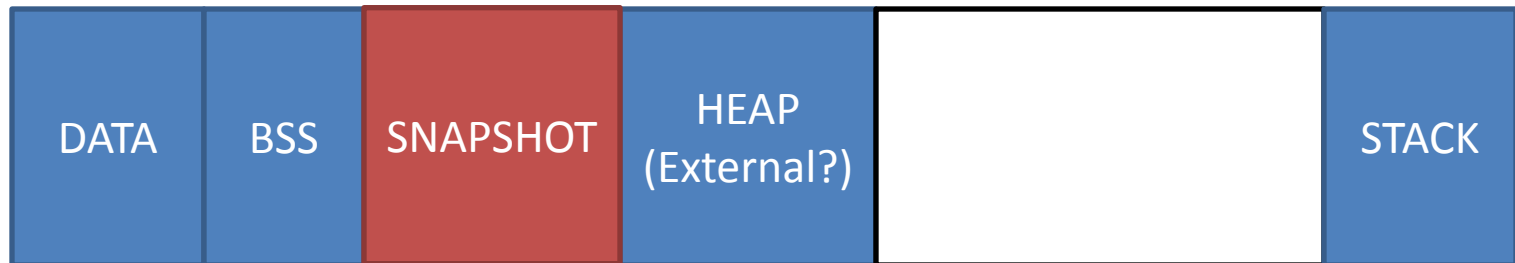
int main(void){
    system_time = 0;
    TIMSK0 |= (1<<TOIE0);
    TCCR0B |= (1<<CS00);
    sei();
    uint32_t l;
    l = 243;
    uint8_t k;
    k = 32;
    uint16_t i;
    i = 100;
    int j;
    j=300;
    foo(1,i,j);
    while(1){}
}

int foo(char a, uint16_t b, int c){
    int x,y,z;
    x=a+c;
    y=c-a;
    z=x+y;
    return z;
}

```







Case Study

- test1.c:
 - main->A->B->C
- test2.c:
 - main->A->C
 - |
 - |->B->C
- test3.c:
 - main->A
 - l1
 - l2
- test4.c:
 - main->A
 - l1
 - l2->B
- test5.c:
 - main->A(recursive)

A

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

SP → Y →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| | 0x10F2 |
| | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

CRC
Memory copy

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| R1 | 0x10EE |
| R2 | 0x10ED |
| ... | 0x10EC |
| Rn | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| Y(A) | 0x10F0 |
| Y(A) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| Y(A) | 0x10EC |
| Y(A) | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

Y → SP →

A

B

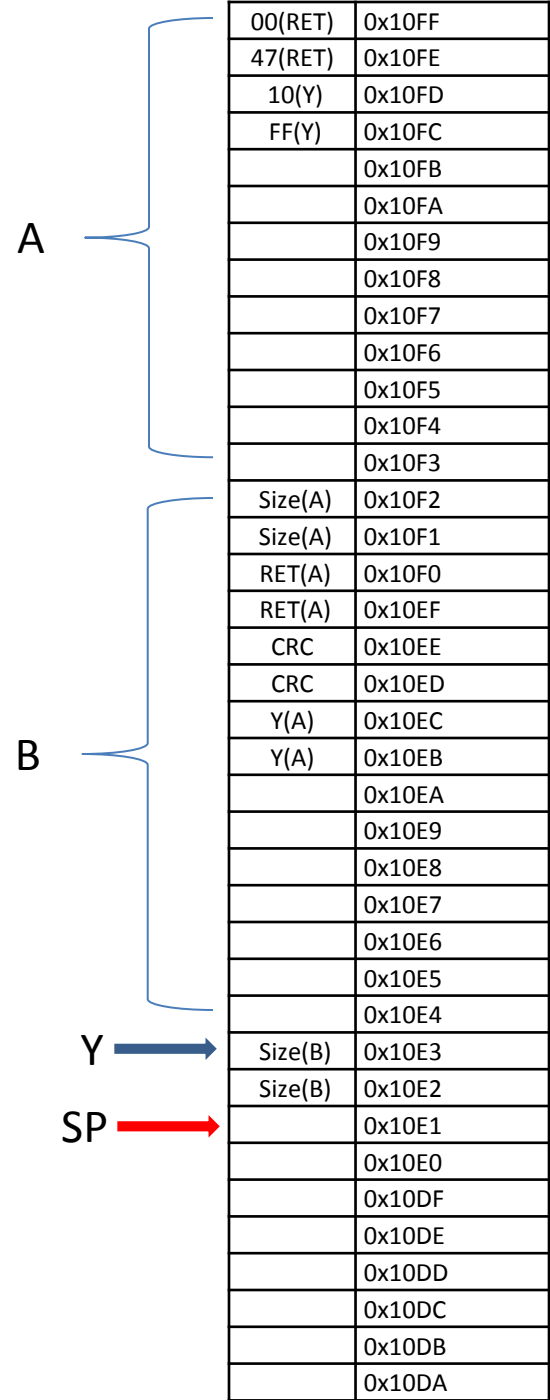
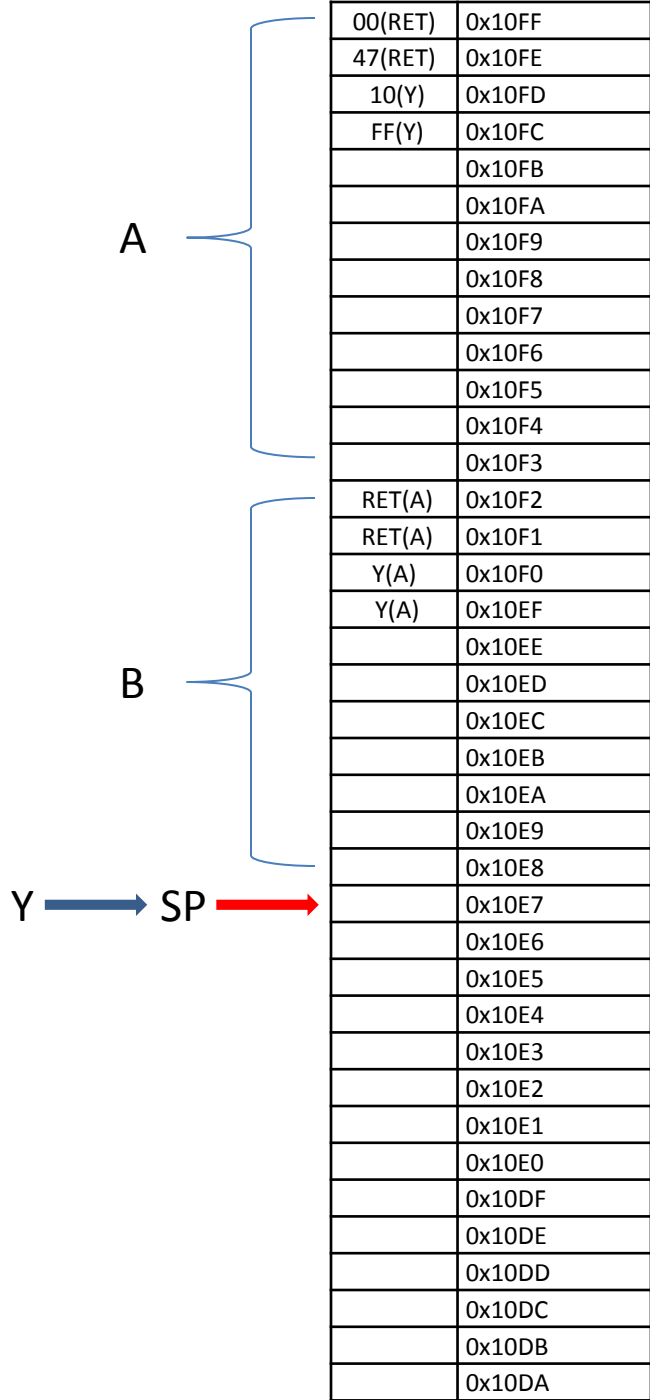
| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| Y(A) | 0x10F0 |
| Y(A) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

Y → SP →

A

B

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| Y(A) | 0x10EC |
| Y(A) | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |



Y → SP →

A

B

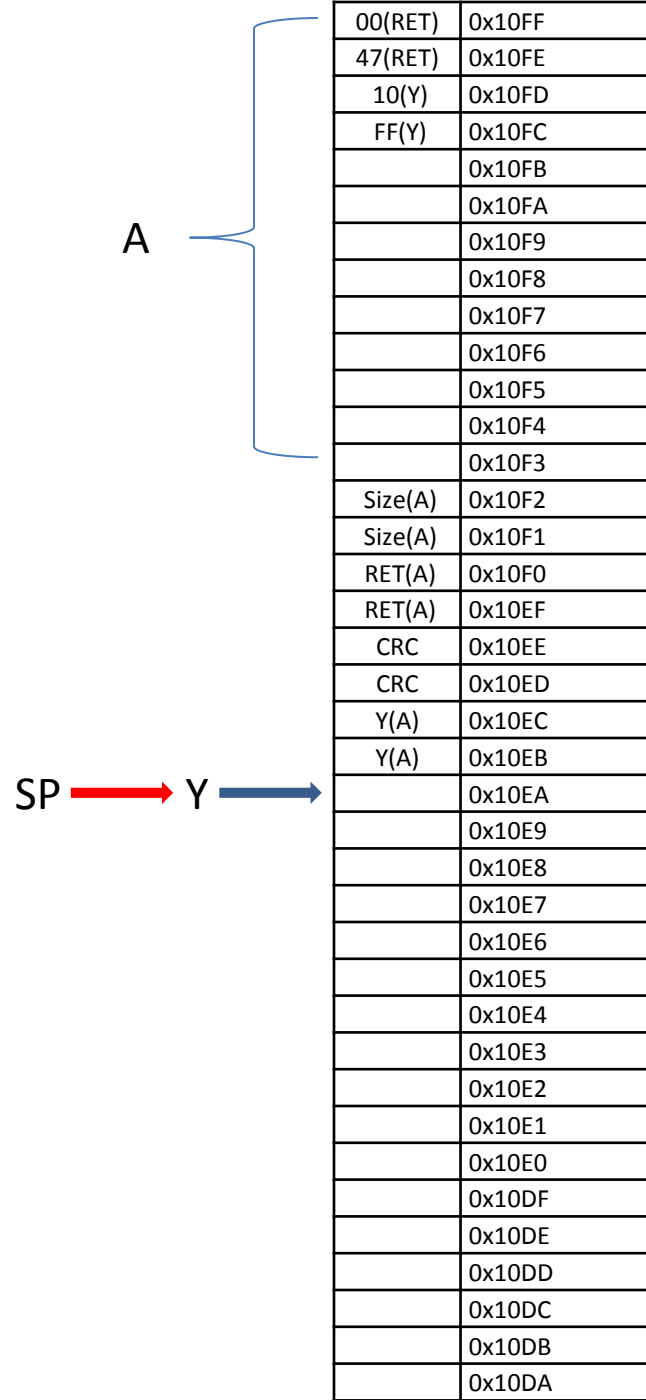
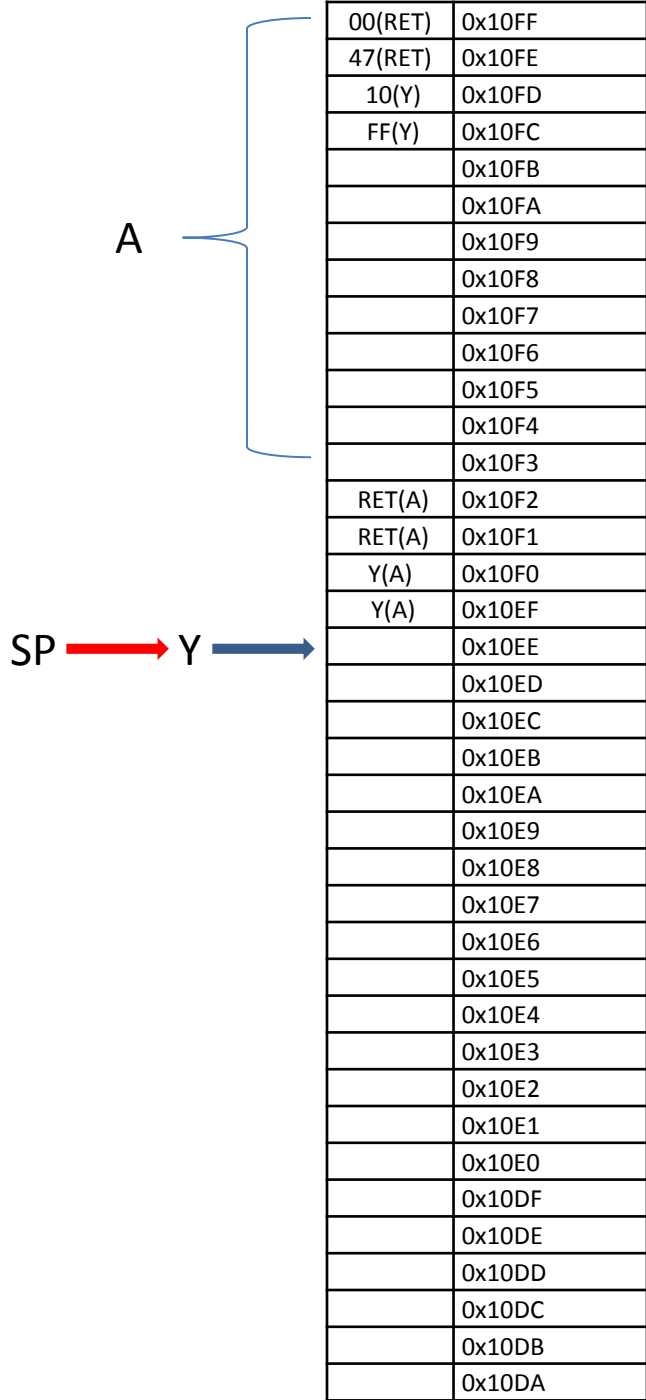
| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| Y(A) | 0x10F0 |
| Y(A) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

Y → SP →

A

B

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| Y(A) | 0x10EC |
| Y(A) | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |



A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y

CRC
Memory copy

SP

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| R1 | 0x10EC |
| R2 | 0x10EB |
| ... | 0x10EA |
| Rn | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| CRC | 0x10EE |
| CRC | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

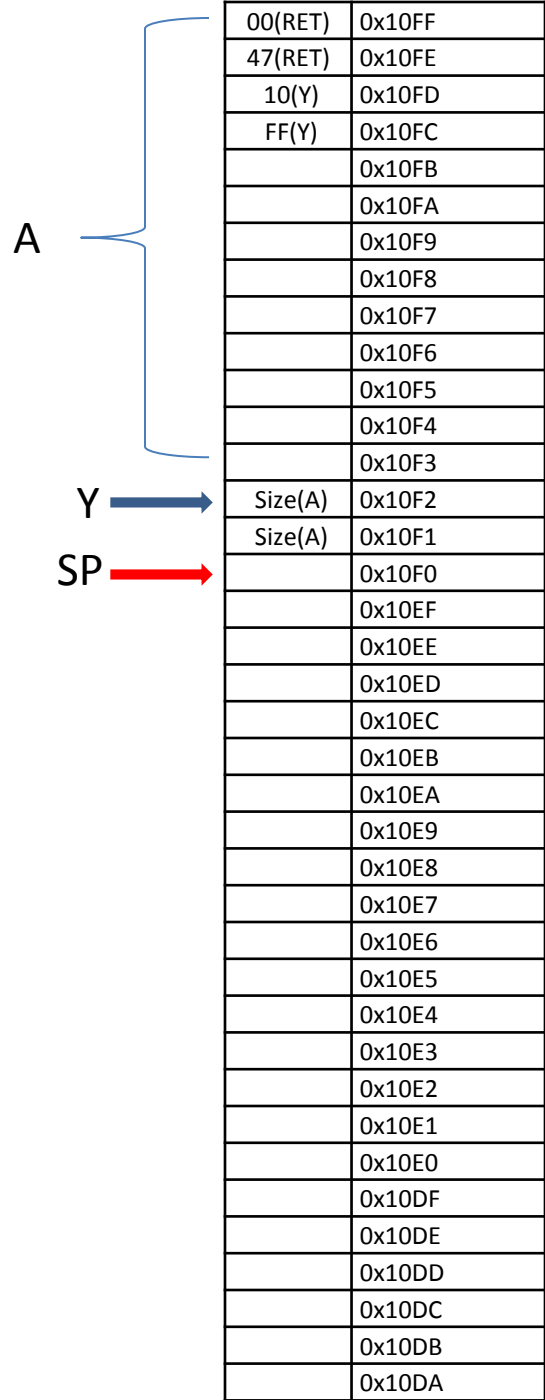
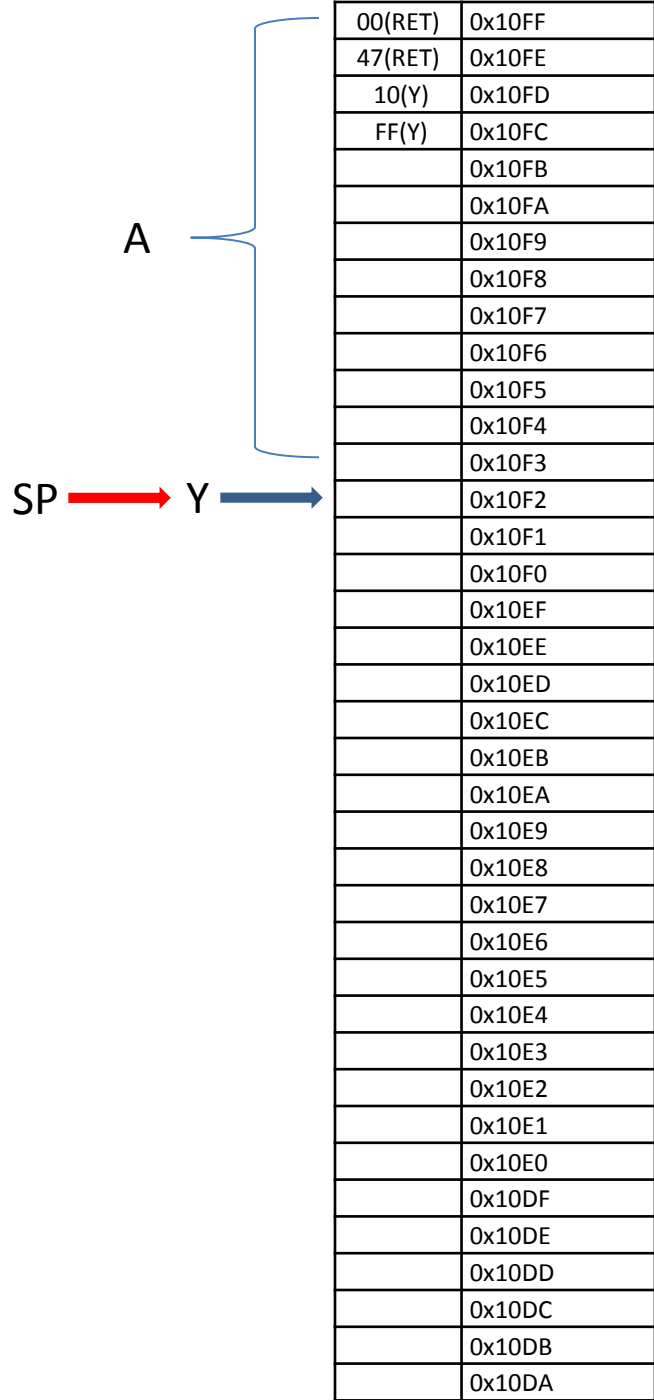
Y →
SP →

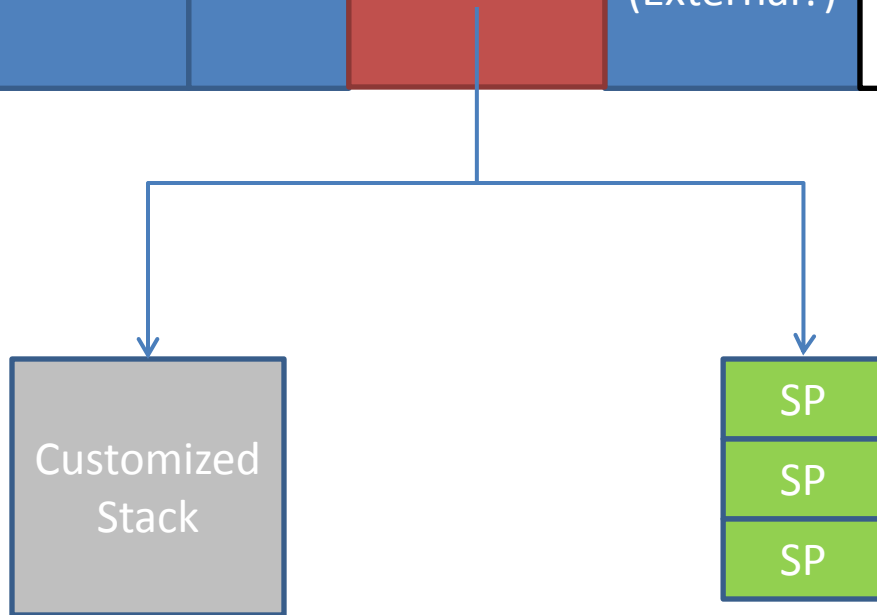
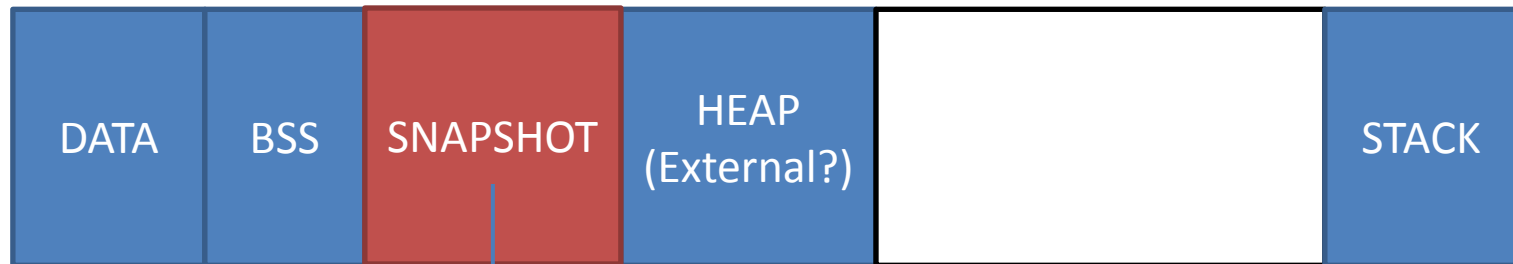
| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| RET(A) | 0x10F2 |
| RET(A) | 0x10F1 |
| | 0x10F0 |
| | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |

A

Y →
SP →

| | |
|---------|--------|
| 00(RET) | 0x10FF |
| 47(RET) | 0x10FE |
| 10(Y) | 0x10FD |
| FF(Y) | 0x10FC |
| | 0x10FB |
| | 0x10FA |
| | 0x10F9 |
| | 0x10F8 |
| | 0x10F7 |
| | 0x10F6 |
| | 0x10F5 |
| | 0x10F4 |
| | 0x10F3 |
| Size(A) | 0x10F2 |
| Size(A) | 0x10F1 |
| RET(A) | 0x10F0 |
| RET(A) | 0x10EF |
| | 0x10EE |
| | 0x10ED |
| | 0x10EC |
| | 0x10EB |
| | 0x10EA |
| | 0x10E9 |
| | 0x10E8 |
| | 0x10E7 |
| | 0x10E6 |
| | 0x10E5 |
| | 0x10E4 |
| | 0x10E3 |
| | 0x10E2 |
| | 0x10E1 |
| | 0x10E0 |
| | 0x10DF |
| | 0x10DE |
| | 0x10DD |
| | 0x10DC |
| | 0x10DB |
| | 0x10DA |





Change gcc?
Use a dedicated
register as the SP.



AVR Studio vs. avrgcc+Simulavr

