

RISC-V Problem 1 - Given the mapping of registers to variables below, write a program to implement the following expression:

```
int func(int A, int B, int C, int D){
    return (A+B)*(C-D);
}
int main(){
    int A=4, B=2, C=6, D=3;
    int z = func(A, B, C, D);
    return 0;
}
```

Registers in main are A=x8, B=9, C=x18, D=x19, Z=x20

You are permitted to use labels in this problem

RISC-V Problem 2 - Given the mapping of registers to variables below, write a program to implement the following expression:

```
void swap(int* A, int* B){
    int temp = *A;
    *A = *B;
    *B = temp;
}

int main(){
    int A=10, B=7;
    swap(&A, &B);
    return 0;
}
```

Registers in main are A=x18, B=19

For simplicity, store A at 0x7fff1a10 for pass by reference

For simplicity, store B at 0x7fff1a18 for pass by reference

You are permitted to use labels in this problem

RISC-V Problem 3 - Given the mapping of registers to variables below, write a program to implement the following expression:

```
int array_sum(int* A, int length){
    int sum = 0;
    for(int i = 0; i < length; ++i){
        sum += A[i];
    }
    return sum;
}

int main(){
    int array[] = {13, 7, -8, 4};
    int array_len = 4;
    int result_sum = array_sum( array, array_len );
    return 0;
}
```

In main, array is in x18 and points to 0x7fff1a10, array\_len is in x19, and result\_sum is in x20.  
In array\_sum, sum is in x21 and i is in x22.