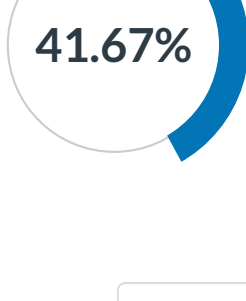


Results

Morgan Bergen — 3rd Attempt

1 question requires grading



5
Out of 12 points

03:11
Time for this attempt

2 attempts left

Take Now

Attempt History

1 question requires grading 1 attempt left 1 attempt left

1 question requires grading

Your Answers:

1 1 / 1 point

Consider the following C code. Let us assume that the function `sum()` is currently executing in the processor. Which main memory address is currently available in the return address register `ra`?

```
int sum(int a, int b)
{
    return a+b;
}

void main() {
    int x=10;
    int y=20;
    int z= sum(x,y);
    z++;
    x=x+2;
}
```

☐ Memory address that stores first instruction of `sum()`

☒ Memory address that stores the line `z++`

☐ Memory address that stores first instruction of `main()`

☐ Memory address that stores the line `x=x+2`

2 0 / 1 point

Match the correct binary values for different steps of 2's complement calculation for decimal number 20

Step 2: Invert the digits

☒ 00010100

Step 1: Convert the decimal to binary

☒ 11101100

Step 3: Add 1 to get the 2's complement

☒ 11101011

3 1 / 1 point

Why do we use registers in addition to the main memory?

☐ Registers provide a non-volatile storage for data

☒ ALU can access the registers faster compared to the main memory

☐ Registers can provide more storage space compared to main memory

☐ ALU can securely access the data in register

4 1 / 1 point

Which are the possible reasons for choosing C over Java for programming embedded hardware?

☐ Simpler to write and easier to maintain

☐ Improved security against overflow attacks

☒ Faster code execution

☒ Low memory requirement

5 1 / 1 point

What operation is always needed before storing (push operation) something to the stack?

☐ Storing the return address to the stack pointer register

☒ Decreasing the stack pointer value

☐ Increasing the stack pointer value

☐ Clearing the existing data on the stack

6 1 / 1 point

Which of the following is true for volatile type qualifier?

☒ Should be used to represent registers of memory-mapped peripheral

☐ Compiler can optimize and remove volatile objects if there is no use in the code

☒ The value of volatile variable could be changed by external devices

☐ Indicates that an object's value is constant

7 0 / 1 point

Let's assume that $x=8$. Which of the following we can calculate using logical left shift?

All numbers in decimal

☐ $x \times 32$

☒ $x \times 8$

☐ $x \times 16$

☐ $x \times 12$

8 5 points possible

a. Write the MIPS assembly code for the assignment statement as given below (2.5 points)

$C[250] = C[240] - b$

C is an array stored in the memory. Assume that register `$s2` is storing the variable `b`, `$s3` is storing the base address of the array `C`. Use register `$t1` for storing temporary values.

b. Write the machine code in binary for the assembly codes for the assembly codes in question (a) and mark the different segments (e.g., *op*, *rs*, *rt* etc.) on the machine code. Use the MIPS instruction reference guide on Canvas. An example format is below: (2.5 points)

000000	10001	10010	01000	00000	100000
opcode	rs	rt	rd	shamt	funct

```
lw $t0, 960($s3)$
sub $t1, $t0, $s2
sw $t1, 1000($s3)
```

Waiting for grade