

# BÁO CÁO TIẾN ĐỘ – ASSIGNMENT 1: INTEGER ARITHMETIC

MSSV: 24127230

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## Screenshots of the program output (Unit Test)

The screenshot shows the VS Code interface with the file explorer on the left displaying '24127230.cpp', '24127230.exe', and 'tempCodeR...'. The main editor shows the C++ code for integer arithmetic. The terminal window at the bottom displays the program's output for the first unit test case where Input A is 10 and Input B is 5. The output shows binary and decimal representations for addition, subtraction, multiplication, division, and modulo operations.

```
int main() {
    int A = getinputnum(inputA);
    int B = getinputnum(inputB);
    arrA = getBit(A);
    arrB = getBit(B);
    cout << "A (Binary): " << arrA << endl;
    cout << "B (Binary): " << arrB << endl;
    cout << "A + B (Binary): " << addBin(arrA, arrB) << endl;
    cout << "A + B (Decimal): " << static_cast<int>(getNum(addBin(arrA, arrB))) << endl;
    cout << "A - B (Binary): " << subtractBin(arrA, arrB) << endl;
    cout << "A - B (Decimal): " << static_cast<int>(getNum(subtractBin(arrA, arrB))) << endl;
    cout << "A * B (Binary): " << multiplyBinary(arrA, arrB) << endl;
    cout << "A * B (Decimal): " << static_cast<int>(getNum(multiplyBinary(arrA, arrB))) << endl;
    cout << "A / B (Binary): " << divideBinary(arrA, arrB) << endl;
    cout << "A / B (Decimal): ";
    if (divideBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(divideBinary(arrA, arrB)));
    cout << endl;
    cout << "A % B (Binary): " << modBinary(arrA, arrB) << endl;
    cout << "A % B (Decimal): ";
    if (modBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(modBinary(arrA, arrB)));
}
```

```
Input A (Decimal): 10
Input B (Decimal): 5
A (Binary): 00001010
B (Binary): 00000101
A + B (Binary): 00001111
A + B (Decimal): 15
A - B (Binary): 00000101
A - B (Decimal): 5
A * B (Binary): 00110010
A * B (Decimal): 50
A / B (Binary): 00000010
A / B (Decimal): 2
A % B (Binary): 00000000
A % B (Decimal): 0
PS C:\Users\kinh\Desktop\HCMUS\HKI(2)\HTMT\Assignment>
```

The screenshot shows the VS Code interface with the file explorer on the left displaying '24127230.cpp', '24127230.exe', and 'tempCodeR...'. The main editor shows the C++ code for integer arithmetic. The terminal window at the bottom displays the program's output for the second unit test case where Input A is -10 and Input B is 10. The output shows binary and decimal representations for addition, subtraction, multiplication, division, and modulo operations.

```
int main() {
    int A = getinputnum(inputA);
    int B = getinputnum(inputB);
    arrA = getBit(A);
    arrB = getBit(B);
    cout << "A (Binary): " << arrA << endl;
    cout << "B (Binary): " << arrB << endl;
    cout << "A + B (Binary): " << addBin(arrA, arrB) << endl;
    cout << "A + B (Decimal): " << static_cast<int>(getNum(addBin(arrA, arrB))) << endl;
    cout << "A - B (Binary): " << subtractBin(arrA, arrB) << endl;
    cout << "A - B (Decimal): " << static_cast<int>(getNum(subtractBin(arrA, arrB))) << endl;
    cout << "A * B (Binary): " << multiplyBinary(arrA, arrB) << endl;
    cout << "A * B (Decimal): " << static_cast<int>(getNum(multiplyBinary(arrA, arrB))) << endl;
    cout << "A / B (Binary): " << divideBinary(arrA, arrB) << endl;
    cout << "A / B (Decimal): ";
    if (divideBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(divideBinary(arrA, arrB)));
    cout << endl;
    cout << "A % B (Binary): " << modBinary(arrA, arrB) << endl;
    cout << "A % B (Decimal): ";
    if (modBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(modBinary(arrA, arrB)));
}
```

```
Input A (Decimal): -10
Input B (Decimal): 10
A (Binary): 11110110
B (Binary): 00001010
A + B (Binary): 00000000
A + B (Decimal): 0
A - B (Binary): 11101100
A - B (Decimal): -20
A * B (Binary): 10011100
A * B (Decimal): -100
A / B (Binary): 11111111
A / B (Decimal): -1
A % B (Binary): 00000000
A % B (Decimal): 0
PS C:\Users\kinh\Desktop\HCMUS\HKI(2)\HTMT\Assignment>
```

```
File Edit Selection View Go Run Terminal ... Assignment
EXPLORER
  ASSIGNMENT
    24127230.cpp U
    24127230.exe U
    tempCodeR... U
  24127230.cpp U
    172 int main() {
    173     int A = getinputnum(inputA), B = getinputnum(inputB);
    174     arrA = getBit(A);
    175     arrB = getBit(B);
    176     cout << "A (Binary): " << arrA << endl;
    177     cout << "B (Binary): " << arrB << endl;
    178     cout << "A + B (Binary): " << addBin(arrA, arrB) << endl;
    179     cout << "A + B (Decimal): " << static_cast<int>(getnum(addBin(arrA, arrB))) << endl;
    180     cout << "A - B (Binary): " << subtractBin(arrA, arrB) << endl;
    181     cout << "A - B (Decimal): " << static_cast<int>(getnum(subtractBin(arrA, arrB))) << endl;
    182     cout << "A * B (Binary): " << multiplyBinary(arrA, arrB) << endl;
    183     cout << "A * B (Decimal): " << static_cast<int>(getnum(multiplyBinary(arrA, arrB))) << endl;
    184     cout << "A / B (Binary): " << divideBinary(arrA, arrB) << endl;
    185     cout << "A / B (Decimal): ";
    186     if (divideBinary(arrA, arrB) != "") cout << static_cast<int>(getnum(divideBinary(arrA, arrB)));
    187     cout << endl;
    188     cout << "A % B (Binary): " << modBinary(arrA, arrB) << endl;
    189     cout << "A % B (Decimal): ";
    190     if (modBinary(arrA, arrB) != "") cout << static_cast<int>(getnum(modBinary(arrA, arrB)));
    191 }
    192
    Invalid number! Please enter a valid signed integer:-12
    Input B (Decimal): -4
    A (Binary): 11110100
    B (Binary): 11111100
    A + B (Binary): 11110000
    A + B (Decimal): -16
    A - B (Binary): 11111000
    A - B (Decimal): -8
    A * B (Binary): 00110000
    A * B (Decimal): 48
    A / B (Binary): 00000011
    A / B (Decimal): 3
    A % B (Binary): 00000000
    A % B (Decimal): 0
    PS C:\Users\kinhq\Desktop\HCMUS\HKI(2)\HTMT\Assignment>
```

```
File Edit Selection View Go Run Terminal ... Assignment
EXPLORER
  ASSIGNMENT
    24127230.cpp U
    24127230.exe U
    tempCodeR... U
  24127230.cpp U
    172 int main() {
    173     int A = getinputnum(inputA), B = getinputnum(inputB);
    174     arrA = getBit(A);
    175     arrB = getBit(B);
    176     cout << "A (Binary): " << arrA << endl;
    177     cout << "B (Binary): " << arrB << endl;
    178     cout << "A + B (Binary): " << addBin(arrA, arrB) << endl;
    179     cout << "A + B (Decimal): " << static_cast<int>(getnum(addBin(arrA, arrB))) << endl;
    180     cout << "A - B (Binary): " << subtractBin(arrA, arrB) << endl;
    181     cout << "A - B (Decimal): " << static_cast<int>(getnum(subtractBin(arrA, arrB))) << endl;
    182     cout << "A * B (Binary): " << multiplyBinary(arrA, arrB) << endl;
    183     cout << "A * B (Decimal): " << static_cast<int>(getnum(multiplyBinary(arrA, arrB))) << endl;
    184     cout << "A / B (Binary): " << divideBinary(arrA, arrB) << endl;
    185     cout << "A / B (Decimal): ";
    186     if (divideBinary(arrA, arrB) != "") cout << static_cast<int>(getnum(divideBinary(arrA, arrB)));
    187     cout << endl;
    188     cout << "A % B (Binary): " << modBinary(arrA, arrB) << endl;
    189     cout << "A % B (Decimal): ";
    190     if (modBinary(arrA, arrB) != "") cout << static_cast<int>(getnum(modBinary(arrA, arrB)));
    191 }
    192
    Input A (Decimal): 120
    Input B (Decimal): 10
    A (Binary): 01111000
    B (Binary): 00001010
    A + B (Binary): 10000010
    A + B (Decimal): -126
    A - B (Binary): 01101110
    A - B (Decimal): 110
    A * B (Binary): 10110000
    A * B (Decimal): -80
    A / B (Binary): 00001100
    A / B (Decimal): 12
    A % B (Binary): 00000000
    A % B (Decimal): 0
    PS C:\Users\kinhq\Desktop\HCMUS\HKI(2)\HTMT\Assignment>
```

```
File Edit Selection View Go Run Terminal ... Assignment
EXPLORER
  ASSIGNMENT
    24127230.cpp U
    24127230.exe U
    tempCodeR... U
  24127230.cpp U
    172 int main() {
    180     int A = getinputnum(inputA), B = getinputnum(inputB);
    187     arrA = getBit(A);
    188     arrB = getBit(B);
    189     cout << "A (Binary): " << arrA << endl;
    190     cout << "B (Binary): " << arrB << endl;
    191     cout << "A + B (Binary): " << addBin(arrA, arrB) << endl;
    192     cout << "A + B (Decimal): " << static_cast<int>(getNum(addBin(arrA, arrB))) << endl;
    193     cout << "A - B (Binary): " << subtractBin(arrA, arrB) << endl;
    194     cout << "A - B (Decimal): " << static_cast<int>(getNum(subtractBin(arrA, arrB))) << endl;
    195     cout << "A * B (Binary): " << multiplyBinary(arrA, arrB) << endl;
    196     cout << "A * B (Decimal): " << static_cast<int>(getNum(multiplyBinary(arrA, arrB))) << endl;
    197     cout << "A / B (Binary): " << divideBinary(arrA, arrB) << endl;
    198     cout << "A / B (Decimal): ";
    199     if (divideBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(divideBinary(arrA, arrB)));
    200     cout << endl;
    201     cout << "A % B (Binary): " << modBinary(arrA, arrB) << endl;
    202     cout << "A % B (Decimal): ";
    203     if (modBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(modBinary(arrA, arrB)));

    Input A (Decimal): 25
    Input B (Decimal): 0
    A (Binary): 00011001
    B (Binary): 00000000
    A + B (Binary): 00011001
    A + B (Decimal): 25
    A - B (Binary): 00011001
    A - B (Decimal): 25
    A * B (Binary): 00000000
    A * B (Decimal): 0
    A / B (Binary):
    A / B (Decimal):
    A % B (Binary):
    A % B (Decimal):
    PS C:\Users\kinhq\Desktop\HCMUS\HKI(2)\HTMT\Assignment>
```

```
File Edit Selection View Go Run Terminal ... Assignment
EXPLORER
  ASSIGNMENT
    24127230.cpp U
    24127230.exe U
    tempCodeR... U
  24127230.cpp U
    172 int main() {
    180     arrA = getinputnum(inputA), B = getinputnum(inputB);
    187     arrA = getBit(A);
    188     arrB = getBit(B);
    189     cout << "A (Binary): " << arrA << endl;
    190     cout << "B (Binary): " << arrB << endl;
    191     cout << "A + B (Binary): " << addBin(arrA, arrB) << endl;
    192     cout << "A + B (Decimal): " << static_cast<int>(getNum(addBin(arrA, arrB))) << endl;
    193     cout << "A - B (Binary): " << subtractBin(arrA, arrB) << endl;
    194     cout << "A - B (Decimal): " << static_cast<int>(getNum(subtractBin(arrA, arrB))) << endl;
    195     cout << "A * B (Binary): " << multiplyBinary(arrA, arrB) << endl;
    196     cout << "A * B (Decimal): " << static_cast<int>(getNum(multiplyBinary(arrA, arrB))) << endl;
    197     cout << "A / B (Binary): " << divideBinary(arrA, arrB) << endl;
    198     cout << "A / B (Decimal): ";
    199     if (divideBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(divideBinary(arrA, arrB)));
    200     cout << endl;
    201     cout << "A % B (Binary): " << modBinary(arrA, arrB) << endl;
    202     cout << "A % B (Decimal): ";
    203     if (modBinary(arrA, arrB) != "") cout << static_cast<int>(getNum(modBinary(arrA, arrB)));

    if ($?) { .\24127230 }
    Input A (Decimal): 5
    Input B (Decimal): 3
    A (Binary): 00000101
    B (Binary): 00000011
    A + B (Binary): 00001000
    A + B (Decimal): 8
    A - B (Binary): 00000010
    A - B (Decimal): 2
    A * B (Binary): 00001111
    A * B (Decimal): 15
    A / B (Binary): 00000001
    A / B (Decimal): 1
    A % B (Binary): 00000010
    A % B (Decimal): 2
```

What percentage of the work is done?

50%