

University of Massachusetts Dartmouth  
Department of Electrical and Computer Engineering

ECE 160  
Lab #3

Name: `evalexpr.txt`  
Due: see <http://ece160.org>

NOTE some problems in this lab adapted from Let Us C, 8<sup>th</sup> Edition, Y.P. Kanetkar (your textbook)

Evaluate each of the following expressions. State the value of the expression, and also specify the type as follows:

int        just specify the value (with no "." or ".0");  
float      show 6 decimal place (for example, 4.500000 or 4.333333)  
double    show 12 decimal places (6.000000000000 or 123.333333333333)

If an expression is illegal, state so.

Examples:	<code>5 + 3.0 * 8</code>	Answer:	<code>29.000000000000</code>
	<code>7 + 3 * 9</code>	Answer:	<code>34</code>
	<code>3.5f * 2</code>	Answer:	<code>7.000000</code>

1. `5 + 7/2`
2. `5.0 + 7/2`
3. `5 + 7.0f/2`
4. `19%3`
5. `3%19`
6. `3.0%19.0`
7. `19/3`
8. `3/19`
9. `3.0/10.0`
10. `10.0f/3.0f`
11. `10/3.0`
12. `3/10.0`
13. `5.0 + 5 + 5 % 10 * 2`
14. `3.0 + 8.0 * 10 / 20`
15. `5 * 3 % 3 / 6 + 14 + 10 / 2`
16. `5 * (3 % 3) / 6 + 14.0 + 10/3`
17. `2 * 3 + (4 + 5) % 2 * 6`
18. `100/20/5/2`

State what value the variable on the left will have after execution of the assignment statement. All code in this section is believed to be syntactically correct. If you believe there is an error, please ask.

Example: `int b;`  
`b=3.0/2.0+5*4/3;`  
answer: 7

19. `int big=2;`  
`float abc=2.5, g;`  
`g = big/2 + big*4/big - big + abc/3;`
20. `int ink=4, act=1, on;`  
`float tig=3.2;`  
`on = ink * act/2 + 3/2*act + 2 + tig;`
21. `int qui=4, add=2, gmd=2, s;`  
`s=qui*add/4-6/2+2/3*6/gmd;`
22. `int a=4, g=3, s;`  
`s=1/3*a/4-6/2+2/3*6/g;`
23. `float g;`  
`g=10/5/2/1;`
24. `float b;`  
`b=3/2+5*4/3;`
25. `float a,c;`  
`int b;`  
`a = b = c = 3.0/4.0;`

Convert the following equations into corresponding C statements.

26. 
$$Z = \frac{\frac{8.8(a+b)^2}{c} - 0.5 + \frac{2a}{q+r}}{(a+b)\left[\frac{1}{m}\right]}$$

27. 
$$x = \frac{-b + \sqrt{b^2 - 4ac}}{2a}$$

28. 
$$R = \frac{2v + 6.22(c+d)}{g+v}$$

29. 
$$A = \frac{\frac{7.7b(xy+a)}{c} - 0.8 + 2b}{(x+a)\left(\frac{1}{y}\right)}$$

Predict the output for each of the following programs. All code in this section is believed to be syntactically correct. If you believe there is an error, please ask. You MAY run the programs if you wish; you do not have to. DO NOT submit any .cpp files.

```
30. #include <stdio.h>
void main()
{
    int i=2, j=3, k, m;
    float a, b;
    k = i / j * j;
    m = j / i * i;
    a = i / j * j;
    b = j / i * i;
    printf("%d %d %f %f", k,m,a,b);
}
```

```
31. #include <stdio.h>
void main()
{
    int a,b;
    a = -3 - - 3;
    b = -3 - - ( - 3);
    printf("a = %d, b = %d", a, b);
}
```

```
32. #include <stdio.h>
void main()
{
    int a = 5, b = 2;
    float c;
    c = a % b;
    printf("%f", c);
}
```

```
33. #include <stdio.h>
void main()
{
    printf("nn \n\n nn\n");
    printf("nn /n/n nn/n");
}
```