

MIDTERM 1 CS111 Summer 2019

NAME _____ CUNYID _____

Instructions:

- 1) Make sure your name and CUNY ID are filled in.
- 2) When asked to write a program, begin with the main portion of the program. In most cases I have written the beginning of the function for you and you just fill in the rest.

SECTION 1 – Programming Questions 5 Points each

I am writing program that will fly an airplane, drive a car, or trade stocks.

Q1) Should I use a high- or low-level language? Explain:

See <https://codeforwin.org/2017/05/high-level-languages-advantages-disadvantages.html>
Low level because it has to be fast/very responsive.

I am writing an accounting program or a data entry program.

Q2) Should I use a high- or low-level language? Explain:

See <https://codeforwin.org/2017/05/high-level-languages-advantages-disadvantages.html>
High level because it speed it is not as important as development time.

Q3) In C what symbol defines the end of a statement? Semi colon (;)

Q4) Does the program below contain any Errors? If there are, what are they?

Error – Code must be within function

```
cout << "Hello World!" << endl;
int main()
{
    return(0);
}
```

Q5) Does the program below contain any Errors? If there are, what are they?

No

```
int main()
{
    int i = 9.9;
    return(i);
}
```

Q6) One of the lines below is incorrect. Which one? Why?

Line 4 – Array is too small. More than 5 characters in “Hello World”.

Line 1 - int a, b, c;

Line 2 - int d=-1, e=2, f=3;

Line 3 - int g = 2.0, h = 3, i = 'C';

Line 4 - char text[5] = "Hello World!";

Section 2 – Understanding Programming Logic 5 Points Each

Q1) What is the output of the code below?

8 17 7 24 9 24

```
int main()
{
    int i = 9;
    int j = i;
    {
        int i = 8;
        j += i;
        cout << i << j;
        {
            int i = 7;
            j += i;
            cout << i << j;
        }
    }
    cout << i << j << endl;
}
```

Q2) What is the output of the code below?

NO OUTPUT

```
int main()
{
    if(1/2==2/2)
    {
        int i=23; i++;i+= 2; cout<<i<<endl;
    }
    return(0);
}
```

Q3) What is the output of the code below?

16

```
double d = (6 / 2.5*2.5) + 10;
cout << d << endl;
```

Q4) What is the output of the code below?

c is equal to i

```
int i = 70;
char c = 'A';
c += 5;
if (c != i)
    cout << "c is not equal to i";
else
    cout << "c is equal to i";
```

Q5) What is the output of the code below?

5

```
int i = 55;
if (i % 10 == 55 / 11)
    cout << i % 10 << endl;
else
    cout << i << endl;
```

Q6) What is the output of the code below?

4

```
int x = 8;
int y = 8;
int z = 4;
if ((x > y) && (x > z))
    cout << x << endl;
else if ((y > x) && (y > z))
    cout << x << endl;
else
    cout << z;
```

Section 3 – Programming 20 Points each

Q1) Containers needed

Finish the program below that asks the user how much liquid they need to store and the size of the containers that will store the liquid. The program will then output the number of containers needed to store ALL the liquid.

Note: The liquid amount and container size can have decimals. The last container may only be partially full.

Sample **Input**

Output

Liquid : 100.50 Container: 100.25 → “You will need 2 container(s)”.

Liquid : 100.0 Container: 25.0 → “You will need 4 container(s)”.

Liquid : 100.0 Container: 200.0 → “You will need 1 container(s)”.

```
int main()
{
    cout << "Enter the amount of liquid you wish to store." << endl;
    double liquid_size;
    cin >> liquid_size;

    cout << "Enter the the container size." << endl;
    double container_size;
    cin >> container_size;

    int numOfContainers = liquid_size / container_size;
    if (liquid_size > (numOfContainers*container_size))
        numOfContainers++;
    cout << "You will need " << numOfContainers << " containers" << endl;
    return(0);
}
```

Q2) Calculator

Finish the program below that asks the user for two numbers and the operation they want to perform. The valid operations are '+' and '-'. If the user doesn't enter a valid operation, the program should exit with an error message, otherwise the requested operation should be output.

Sample **Input**

'2' '5' '+'

'2' '5' '-'

'2' '5' '*'

Output

7

-3

"Invalid Operation. Run program again"

```
int main()
{
    cout << "Enter two whole numbers." << endl;
    int num1, num2;
    cin >> num1;
    cin >> num2;
    cout << "Enter the operation you wish to perform on these numbers."
        << endl;
    cout << "Choices are one of the following: +,-" << endl;
    char operation=' ';
    cin >> operation;

    // validate the user entered a valid operation
    // if not exit program
    if ((operation != '+') && (operation != '-'))
    {
        cout << "Invalid Operation. Try Again!";
        return(1);
    }
    if (operation == '+')
        cout << num1 + num2 << endl;
    if (operation == '-')
        cout << num1 - num2 << endl;
    return(0);
}
```

```

    return(0);
}

```

ASCII CHART

Dec	Hex	Oct	Chr	Dec	Hex	Oct	HTML	Chr	Dec	Hex	Oct	HTML	Chr	Dec	Hex	Oct	HTML	Chr
0	0	000	NULL	32	20	040	 	Space	64	40	100	@	@	96	60	140	`	`
1	1	001	Start of Header	33	21	041	!	!	65	41	101	A	A	97	61	141	a	a
2	2	002	Start of Text	34	22	042	"	"	66	42	102	B	B	98	62	142	b	b
3	3	003	End of Text	35	23	043	#	#	67	43	103	C	C	99	63	143	c	c
4	4	004	End of Transmission	36	24	044	$	\$	68	44	104	D	D	100	64	144	d	d
5	5	005	Enquiry	37	25	045	%	%	69	45	105	E	E	101	65	145	e	e
6	6	006	Acknowledgment	38	26	046	&	&	70	46	106	F	F	102	66	146	f	f
7	7	007	Bell	39	27	047	'	'	71	47	107	G	G	103	67	147	g	g
8	8	010	Backspace	40	28	050	((72	48	110	H	H	104	68	150	h	h
9	9	011	Horizontal Tab	41	29	051))	73	49	111	I	I	105	69	151	i	i
10	A	012	Line feed	42	2A	052	*	*	74	4A	112	J	J	106	6A	152	j	j
11	B	013	Vertical Tab	43	2B	053	+	+	75	4B	113	K	K	107	6B	153	k	k
12	C	014	Form feed	44	2C	054	,	,	76	4C	114	L	L	108	6C	154	l	l
13	D	015	Carriage return	45	2D	055	-	-	77	4D	115	M	M	109	6D	155	m	m
14	E	016	Shift Out	46	2E	056	.	.	78	4E	116	N	N	110	6E	156	n	n
15	F	017	Shift In	47	2F	057	/	/	79	4F	117	O	O	111	6F	157	o	o
16	10	020	Data Link Escape	48	30	060	0	0	80	50	120	P	P	112	70	160	p	p
17	11	021	Device Control 1	49	31	061	1	1	81	51	121	Q	Q	113	71	161	q	q
18	12	022	Device Control 2	50	32	062	2	2	82	52	122	R	R	114	72	162	r	r
19	13	023	Device Control 3	51	33	063	3	3	83	53	123	S	S	115	73	163	s	s
20	14	024	Device Control 4	52	34	064	4	4	84	54	124	T	T	116	74	164	t	t
21	15	025	Negative Ack.	53	35	065	5	5	85	55	125	U	U	117	75	165	u	u
22	16	026	Synchronous idle	54	36	066	6	6	86	56	126	V	V	118	76	166	v	v
23	17	027	End of Trans. Block	55	37	067	7	7	87	57	127	W	W	119	77	167	w	w
24	18	030	Cancel	56	38	070	8	8	88	58	130	X	X	120	78	170	x	x
25	19	031	End of Medium	57	39	071	9	9	89	59	131	Y	Y	121	79	171	y	y
26	1A	032	Substitute	58	3A	072	:	:	90	5A	132	Z	Z	122	7A	172	z	z
27	1B	033	Escape	59	3B	073	;	;	91	5B	133	[[123	7B	173	{	{
28	1C	034	File Separator	60	3C	074	<	<	92	5C	134	\	\	124	7C	174	|	
29	1D	035	Group Separator	61	3D	075	=	=	93	5D	135]]	125	7D	175	}	}
30	1E	036	Record Separator	62	3E	076	>	>	94	5E	136	^	^	126	7E	176	~	~
31	1F	037	Unit Separator	63	3F	077	?	?	95	5F	137	_	_	127	7F	177		Del

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