Computer Chocolate Code-off:

Rules:

1. **Create one answer sheet with all group member names on it! (to be given to another group for grading No running code (you may use class notes)**
2. **You may ask yes/no questions**
3. **First Place: 3 E.C. pts on Exam, 2nd Place: 2 E.C. pts, 3rd Place: 1 E.C. pt PLUS CHOCOLATE**

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Problem 1: What is printed in main?

```
void func1(char *w, char &x, char y, char z);
int main() {
	char a = 'p';
	char b = 'h';
	char c = 'a';
	char d = 'y';
	cout << b << c << a << a << d << endl; _____________________
	func1(&a,b,c,d);
	cout << a << c << 'n' << b << d << endl;_____________________
	return(0);
}
void func1(char *w, char &x, char y, char z) {
	*w = 'c';
	x = 'd';
	y = 's';
	z = 'i';
}
```

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Problem 2:

```
Where does “new” put things? _____________________
What does “new” return? _____________________
Create a variable that will hold what new returns (assuming it points to an
int):_____________________
```

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Problem 3: What is printed out in main?

```
string rec4(int x,string *arr, int len);
int main() {
	string a[9] = {"k","m","v","y","s","t","w","h","u"};
	cout << rec4(0,a,9); _____________________________
	return(0);
}
string rec4(int x,string *arr, int len) {
	if (x == len) {
		return "";
	}
	else {
		if (x%2 == 1) {
			return arr[x] + rec4(x+1,arr,len);
		}
		else {
			return rec4(x+1,arr,len);
		}
	}
}
```

Problem 4: What is printed out in main?

```
void func2(char *arr);
int main() {
	char a[5] = {'s','t','a','r','k'};
	for (int i = 0; i < 5; i++) {
		cout << a[i];   _____________________________
	}
	cout << endl;
	func2(a);
	for (int i = 0; i < 5; i++) {
		cout << a[i]; _____________________________
	}
	cout << endl;
	return(0);
}
void func2(char *arr) {
	arr[3] = 'c';
}
```

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Problem 5: What is printed out in main?

```
class ThisClass{
public:
	string s1;
	ThisClass(string s);
};
ThisClass::ThisClass(string s) {
	s1 = s;
}
void func(ThisClass y) {
	y.s1 = "ho";
}
int main() {
	ThisClass x("hi");
	cout << x.s1<<endl; _____________________________
	func(x);
	cout << x.s1 << endl; _____________________________
	return(0);
}
```

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Problem 6: What is wrong with the following class definition? _____ _____

```
class ThisClass{
	int *arr;
	int len;
public:
	ThisClass(int x);
	~ThisClass();
};
ThisClass::ThisClass(int x) {
	len = x;
	arr = new int[len];
	for (int i = 0; i < len; i++) {
		arr[i] = pow(i,3);
	}
}
ThisClass::~ThisClass() {
	cout << "bye now" << endl;
}
```

****

Problem 7: show what is printed out below

```
int *func2(int *a, int *b, int &c, int d);
int main() {
       int arr[4] = {3,2,4,1};  //address of first value: 0x0c
       int x = 32;  //address of x: 0x08
       int y = 24;  //address of y: 0x04
       int z = 12;   //address of z: 0x00
       int *arr2=func2(&x,arr,y,z);
       cout << arr2<<endl; _______________
       arr2[2] = 8;
       cout << arr[2] << endl; _________________
       return (0);
}
int *func2(int *a, int *b, int &c, int d) {

       cout << a << endl; _____________

       cout <<&b[0] << endl; _________________

       cout << &c << endl; _________________

       cout << d << endl; _________________
       return b;
}
```

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Problem 8: What is printed out in main?

```
int rec3(int m, int n);
int main() {
       /* Problem D */
       cout << rec3(6,8) << endl; _______________

       cout << rec3(12,9) << endl;_______________
       return(0);
}
int rec3(int m, int n) {
   if(m == n) {
      return m;
   }
   else if (m > n) {
      return rec3(m-n, n);
   }
   else {
      return rec3(m, n-m);
   }
}
```

Problem 9: Given the following, and assuming there's a constructor that initializes everything to either 0 or NULL, fill in the blanks with either Dot (D) or Pointer Dot (PD)

```
class AClass {
public:
	int x;
	int *y;
	int z[4] = {3,4,1,8};
	AClass *neighbor;
};

int main() {
	AClass a;
	a__________x = 3;
	a__________y = new int[3];
	a__________y[3] = 4;
	a__________z[2] = 12;

	AClass *b = new AClass();
	b__________x = 4;
	b__________y = new int[5];
	b__________y[3] = 2;
	b__________z[1] = 8;

	AClass *c = new AClass[3];
	c[0]________x = 2;
	c[0] _________y = new int[4];
	c[0] _________y[2] = 3;
	c[0] _________z[2] = 7;

	a_________neighbor = new AClass();
	a_________neighbor____________x = 3;
	a_________neighbor____________y = new int[4];
	return (0);
}
```

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Problem 10: what is printed in main?

```
void func2(char a[], string *s ) ;
string *func(char arr[], int iarr[], int len) ;
int main() {
	char arr[16] = {'a','t','r','e','o','u','s','o','b','s','k','l','p','e','r','p'};
	int iarr[4] = {7,1,12,4};
	string *s = func(arr,iarr,4);
	cout << *s << endl;   ____________________________________
	return 0;
}
void func2(char a[], string *s ) {
	for (int i = 0; i<3; i++) {
		*s += string(1,a[i]); //converts a character to a string type
	}
}
string *func(char arr[], int iarr[], int len) {
	string *k = new string;
	*k = "";
	for (int i = 0; i < len; i++) {
		func2(&arr[iarr[i]], k);
	}
	return k;
}
```

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Problem 11: What is printed out? _____

```
class MyClass {
	int i;
	string j;
public:
	MyClass(int x,string s);
	~MyClass();

};
MyClass::MyClass(int x,string s) {
	i = x;
	j = s;
}
MyClass::~MyClass() {
	cout << j;
}

void f(int x) {
	MyClass t(2,"n");
	if (x == 3) {
		MyClass t2(3,"c");
	}
	else {
		MyClass t2(7,"t");
	}
	cout <<"a";
}
int main() {
	MyClass t(3,"s");
	MyClass t2(4,"u");
	f(3);
	MyClass t3(2,"ro");
	f(2);
	MyClass t4(1,"ke");
	return(0);

}
```

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Problem 12: Given the following code, what is printed out in main? _____ _____

Why is it bad coding (even though it works!)? _____

```
class Rect {
	int len;
	int width;
	int area;
public:
	Rect(int x,int y);
	Rect();
	Rect operator+(int z);
	int getArea();
};
Rect::Rect(int x, int y) {
	len = x;
	width = y;
	area = x*y;
}
Rect::Rect() {
	len = 0;
	width = 0;
	area = 0;
}
int Rect::getArea() {
	return area;
}
Rect Rect::operator+(int z) {
	Rect r;
	r.len = len - z;
	r.width = width - z;
	if ((r.len>0) && (r.width > 0) ) {
		r.area = r.len *r.width;
	}
	else {
		r.area = 0;
	}
	return r;
}

int main() {
	/* Prob 10 */
	Rect arect(4,6);
	cout << arect.getArea() << endl;
	Rect rect2 = arect + 3;
	cout << rect2.getArea() << endl;

	return(0);

}
```

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Problem 13: What is wrong with the following code (it compiles!)

_____

```
int *MakeIt(int size) {
	int arr[size];
	for (int i = 0; i < size; i++) {
		arr[i] = pow(i,2);  // pow(x,y) returns x to the yth power
	}
	for (int i = 0; i < size; i++) {
		cout << arr[i] << ", ";
	}
	cout << endl;
	return arr;
}
int main() {
	int x = rand()%10+5;
	int *array = MakeIt(x);
	for (int i = 0; i < x; i++) {
		cout << array[i] << ", ";
	}
	cout << endl;
	return(0);
}
```

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Problem 14: What gets printed out? _____

```
class MyClass {
	char arr[15] = {'y','s','e','z','t','b','a','p','k','r','n','l','c','h','b'};
	int len;
	string s;
public:
	MyClass(int x);
	void MyRec(int x);
	int getLen();
};
MyClass::MyClass(int x) {
	len = x;
	s = "";
}
int MyClass::getLen() {
	return len;
}
void MyClass::MyRec(int x) {
	if (x < 0) {
		cout << s << endl;
	}
	else {
		if (x%3 == 0) {
			s += arr[x];
		}
		MyRec(x-1);
	}
}

int main() {
	MyClass k(15);
	k.MyRec(k.getLen()-1);
	return (0);
}
```

****

Problem 15: What is printed out?

```
void rec1(int x, int y, int z);
void rec2(int x, int y);

int main() {
	rec2(1,5);

	return(0);

}

void rec1(int x, int y, int z) {
	if (z == y) {
		cout << endl;
	}
	else if ((z < x) || z > (y-x-1)) {
		cout << z;
		rec1(x,y,z+1);
	}
	else  {
		cout << "*";
		rec1(x,y,z+1);
	}
}
void rec2(int x, int y) {
	if (x > (y/2)+1) {
		return;
	}
	else {
		rec1(x,y,0);
		rec2(x+1,y);
	}
}
```

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Problem 16 (CHALLENGING: 2 pts): _____

Given the following code, what is printed in main?

```
void f4(char ***k, int *x,int *y, string s) {
	*x = 5;
	*y = 5;
	*(k) = new char* [*x];
	for (int i = 0; i < *x; i++) {
		(*k)[i] = new char [*y];
		for (int j = 0; j < *y; j++) {
			(*k)[i][j] = s[*x*i+j];
		}
	}
}
void print(char **k, int x, int y) {
	for (int i = 0; i < x; i++) {
		for (int j = 0; j < y; j++) {
			if (i == j+1) {
				cout << k[i][j] ;
			}
		}
	}
	cout << endl << endl;
}
int main() {
	string s = "cgeidhjklmaeqrkuvaxypbcpeghijsmnopqursuvwxyzabcd";
	int x = -1;
	int y = -1;
	char **cc = NULL;
	f4(&cc,&x,&y,s);
	print(cc,x,y);
}
```