# Wentworth Institute of Technology

## Computer Science

**Part 1: Multiple choice Questions – Single Answer**

1. Which of the following is the correct way to determine if a file stream named inFile opened correctly?
   1. if( inFile.open() )
   2. if( inFile.fail() )
   3. if( inFile.opened() )
   4. if( inFile.failed() )

ANSWER: B

1. If you have a class named myPersonClass, which of the following correctly declare a constructor in the class definition?
   1. myPersonClass::myPersonClass();
   2. myPersonClass();
   3. init();
   4. cast();

ANSWER: B

1. Given the following class definition and the following member function header, which is the correct way to output the private data?

class Person

{

public:

void outputPerson(ostream& out);

private:

int age;

float weight;

int id;

};

void Person::outputPerson(ostream& out)

{

//what goes here?

}

* 1. out << person.age << person.weight << person.id;
  2. out << person;
  3. out << age << weight << id;
  4. outputPerson(person);

ANSWER: C

1. To overload functions with symbolic names (like + - / <<), you must use the keyword \_\_\_\_\_\_\_ before the symbolic name.
   1. const
   2. operator
   3. reference
   4. void

ANSWER: B

1. Given an array named scores with 25 elements, what is the correct way to access the 25th element?
   1. scores+25
   2. scores[24]
   3. scores[25]
   4. scores[last]

ANSWER: B

1. If we want a search function to search an array for some value and return either the index where the value was found, or -1 if not found, which of the following prototypes would be appropriate?
   1. void search(const int array, int target, int numElements);
   2. void search(const int array, int target);
   3. int search(const int array[], int numElements);
   4. int search(const int array[], int target, int numElements);

ANSWER: D

1. Given the following strucure definitions, what is the correct way to print the person's birth year?

struct DateType{

int day;

int month;

int year;

}

struct PersonType{

int age;

float weight;

DateType birthday;

}

PersonType person;

* 1. cout << person.birthday.year;
  2. cout << year;
  3. cout << birthday.year;
  4. cout << peson.year;

ANSWER: A

1. Given the following class and array declaration, how would you print out the age of the 10th person in the array?

class personClass

{

public:

void setAge(int newAge);

void setGender( char newGender);

void setSalary(float newSalary);

int getAge();

char getGender();

float getSalary();

private:

int age;

char gender;

float salary;

};

personClass people[100];

* 1. cout << people[10];
  2. cout << people[9];
  3. cout << people[9].age;
  4. cout << people[9].getAge();

ANSWER: D

1. How many members (data and functions) does the following class have?

class Rational

{

public:

Rational( );

Rational(int numer, int denom);

Rational(int whole);

int getNumerator( );

int getDenominator( );

friend void display(ostream& out, const Rational& value);

private:

int numerator;

int denominator;

};

1. 8
2. 2
3. 6
4. 7
5. 5

ANSWER: D

1. If you want to be able to compile the following code,

Rational r1;

int x;

cout << r1 + x << endl;

which overloaded operator(s) do you need?

* 1. friend Rational operator+( const Rational& left, int right);
  2. friend ostream operator << (ostream& out, const Rational& object);
  3. friend void operator+ (const Rational& left, int right);
  4. friend ostream& operator << (ostream& out, const Rational& object);
  5. A and D

ANSWER: E

**Part 2: Predict the output.**

Predict the output that would be shown in the terminal window when the following program fragments are executed: [25 points]

|  |  |
| --- | --- |
| Fragment | Output |
| string str="Wentworth Institute Technology";    for ( int i=0; i<str.length(); i++ )  {  char c = str.at( i );    if ( !( c >= 'a' && c <= 'z' ) )  {  cout << c;  }  } | W I T |
| char str[] = "Wentworth Is Terrific!";  cout << str[0] << str[10] << str[13]; | WIT |
| vector<int> vectorObject;  for(int i = 0; i <5; i++)  vectorObject.push\_back(i);  for(i = vectorObject.size()-1; i>=0; i--)  cout << vectorObject[i] << " "; | 4 3 2 1 0 |

**Part 3: Function Definition**

class Percent

{

public:

friend bool operator ==(const Percent& first, const Percent& second);

friend bool operator <(const Percent& first, const Percent& second);

friend Percent operator +(const Percent& first, const Percent& second);

friend ostream& operator <<(ostream& outs, const Percent& first);

friend istream& operator >>(istream& ins, Percent& first);

Percent(); //value is set to 0

Percent(int percent\_value);//vlaue is set to percent\_value

void print(ostream& out); //print value with %

private:

int value;

};

int main()

{

Percent a(10), b, c;

cout << "Enter a value for b: ";

cin >> b;

c=a+b;

if (a == b)

cout << a;

else if ( a < b)

cout << a << b;

else

cout << a << b << c;

return 0;

}

Present the definition of ..(one or two of the member or friend functions) : [25 points]

bool operator ==(const Percent& first, const Percent& second)

{

return ( first.value == second.value);

}

bool operator <(const Percent& first, const Percent& second)

{

return (first.value < second.value);

}

Percent operator +(const Percent& first, const Percent& second)

{

Percent temp;

temp.value = first.value + second.value;

return temp;

}

ostream& operator <<(ostream& outs, const Percent& first)

{

outs << first.value << "%\n";

return outs;

}

istream& operator >>(istream& ins, Percent& first)

{

ins >> first.value;

return ins;

}

**Part 4: Implementations**

Use the following class definition and the main function. Define all the member and friend functions and submit your cpp file. [25 points]

class Money

{

public:

friend Money add(const Money& amount1, const Money& amount2);

friend bool equal(const Money& amount1, const Money& amount2);

Money(long dollars, int cents); //all\_cents is set to $dolloars.cents

Money(long dollars); //all\_cents is set to $dolloars.00

Money(); //all\_cents is set to $0.00

double get\_value() const; //return all\_cents

void input(); //get amount of money from the user in the form $dollars.cents

void output(); //prints amount of money in the form $dollars.cents

private:

long all\_cents;

};

int main()

{

Money mine(100, 50), yours, total;

yours.input();

cout << "My current amount is ";

mine.output();

cout << "Your current amount is ";

yours.output();

total = add(mine, yours);

cout << "Our total amount is ";

total.output();

if(equal(mine, yours))

cout << "Equal" <<endl;

else

cout << "Not equal" <<endl;

return 0;

}

//member function and friend function definitions go here

Money add(const Money& amount1, const Money& amount2)

{

Money temp;

temp.all\_cents = amount1.all\_cents + amount2.all\_cents;

return temp;

}

bool equal(const Money& amount1, const Money& amount2)

{

return (amount1.all\_cents == amount2.all\_cents);

}

Money::Money(long dollars, int cents)

{

all\_cents = dollars\*100 + cents;

}

Money::Money(long dollars)

{

all\_cents = dollars\*100;

}

Money::Money()

{

all\_cents = 0.0;

}

double Money::get\_value() const

{

return all\_cents;

}

void Money::input()

{

char sym;

float amount;

cout << "Enter your amount in the form $dollars.cents: ";

cin >> sym;

cin >> amount;

all\_cents = amount \*100;

}

void Money::output()

{

cout << "$" << all\_cents/100.0 << endl;

}