

Homework 1

Form of submission: hard copy

1. (35 points) Students A, B, C, D and E are enrolled in a variety of different classes:

A is taking English, Math, and Physics.

B is taking History and Geography.

C is taking Government, History, and Math.

D is taking English, Physics, and Math.

E is taking Government, Math, and Physics

- Draw the conflict graph for this scenario.
 - Express the graph as a 2-dimensional array.
 - Find a collection of maximal independent sets that covers each class exactly once.
 - What does each of these independent sets correspond to?
2. (40 points) Convert the following expressions into the numeral system indicated and solve them by using the ripple-carry algorithm. You must use the complement method. Convert the result back to the decimal system and check your answer. Show your work!
- (Base 10) $645 - 263$
 - (Base 7) $50 - 23$
 - (Base 6) $42 - 37$
3. (25 points) Draw a diagram describing the dependencies of the following nested type definitions (see Lecture 1, Slides 41 and 42). Draw a diagram for each of the type definitions.

```
typedef double type1[3];
```

```
typedef type1 *type2;
```

```
typedef struct {
```

```
    int field1;
```

```
    type2 field2;
```

```
    char field3;
```

```
} type3;
```

```
typedef struct {
```

```
    type2 field1;
```

```
    type3 field2;
```

```
} type4;
```

```
typedef type4 type5[3];
```