

## Chapter 15

15.1

a. `#include <stdio.h>`

```
int main()
{
    int i = 1;
    int sum = 0;

    while(i < 11)
    {
        sum = sum + i;
        ++i;
    }
    printf("%d\n", sum);
}
```

b. `#include <stdio.h>`

```
int main()
{
    int i;
    int sum = 0;

    for (i = 0; i <= 10; ++i)
        sum = sum + i;
    printf("%d\n", sum);
}
```

c. `#include <stdio.h>`

```
int main()
{
    int i = 0;
    int sum = 0;

    while(i < 11)
        sum = sum + i++;
    printf("%d\n", sum);
}
```

d. `#include <stdio.h>`

```
int main()
{
    int i = 0;
    int sum = 0;

    for(i = 0; i <= 10 ;)
        sum = sum + i++;
    printf("%d\n", sum);
}
```

15.3

```
#include <stdio.h>

main()
{
    int smallestNumber;
    int nextInput;

    scanf("%d", &nextInput);

    /* We need to set the initial value of smallestNumber to
       something other than 0 as in the original code */
    smallestNumber = nextInput;

    while (nextInput != -1) {
        if (nextInput < smallestNumber)
            smallestNumber = nextInput;
        scanf("%d", &nextInput);
    }

    if (smallestNumber != -1)
        printf("The smallest number is %d\n", smallestNumber);
    else
        printf("No numbers entered.\n");
}
```

15.5

a. (2,3) (2,4) (3,4) (2,5) (3,5) (4,5) (2,6) (3,6) (4,6) (5,6)

b. 22

c. The code can be made more efficient by changing the inner loop to:

```
for (j = 2; j < (i/2); j++)
```

Doing so reduces the number of calls made to `IsDivisibleBy` by half.

15.7

The program, as is, allows someone to purchase a ticket without first making a reservation.

The following program accepts only 32 reservations for the 10 available seats. A reservation is required before a ticket can be purchased.

```
#include <stdio.h>

#define SEATS 10
#define MAX_RESERVATIONS 32

int main()
{
    int seatsAvailable = SEATS;
    char request;
    int number;
    int resStatus = 0;
    int resNumber = 0;

    do {
        scanf("%c",&request);

        if (request == 'R') {
            if (seatsAvailable && resNumber < MAX_RESERVATIONS) {
                printf("Reservation Approved\n");
                printf("Your reservation number is %d\n", resNumber);
                resNumber++;
            }
            else
                printf("Sorry, flight fully booked\n");
        }

        if (request == 'P') {
            printf("Enter reservation number to confirm purchase : ");
            scanf("%d", &number);

            if ((number >= resNumber) ||          /* Invalid number */
                (resStatus & (1 << number)))    /* Already purchased */
                printf("Invalid reservation number. Purchase denied.\n");
            else {
                resStatus = resStatus | (1 << number);
                seatsAvailable--;
                printf("Ticket Purchased!\n");
            }
        }

    } while (request != 'X');

    printf("Done! %d seats not sold\n", seatsAvailable);
}
```

**Questions in the text denoted by the question mark icon:**

Page 410: The problem with the code in Figure 15.3 is that the local variable **result** in function **AllSum** is uninitialized. It should be set to zero initially.