

F. 15 Chapter 15 Solutions

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 */
                continue;
        }
    } while (1);
}
```

```
        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);
}
```


