

Decision (IF) Constructs

- *Problem:* Prof. Feldman is sometimes a bit absentminded and could use a bit of help in remembering his schedule:
- Monday: work at home
- Tuesday: CSci 49 12:45 - 2:00 PM
CSci 133 2:20 - 3:35 PM
Office hours 4:30 - 6:00 PM
- Wednesday: Office hours 2 - 5:30 PM
- Tuesday: CSci 49 12:45 - 2:00 PM
CSci 133 2:20 - 3:35 PM
Office hours 4:30 - 6:00 PM
- Friday: work at home
- Develop a program to provide this help

Basic Algorithm

1. Prompt user to enter a day of the week.
2. Display the schedule items for that day

Step 2 refinement

If day is Monday, display "work at home"

If day is Tuesday, display Tuesday's items

If day is Wednesday,
display Wednesday's items

If day is Thursday, display Thursday's items

If day is Friday, display "work at home"

If day is Saturday,
display "have a nice weekend"

If day is Sunday, display "have a nice weekend"

```

if (day == 1)          /* Monday */
{
    printf ("Work at home today\n");
}

if (day == 2)          /* Tuesday */
{
    printf ("CSci 49, 12:45 AM - 2:00 PM\n");
    printf ("CSci 133, 2:20 - 3:35 PM\n");
    printf ("Office hours, 4:30 - 6:00 PM\n");
}

if (day == 3)          /* Wednesday */
{
    printf ("Office hours, 2 - 5:30 PM\n");
}

if (day == 4)          /* Thursday */
{
    printf ("CSci 49, 12:45 AM - 2:00 PM\n");
    printf ("CSci 133, 2:20 - 3:35 PM\n");
    printf ("Office hours, 4:30 - 6:00 PM\n");
}

if (day == 5)          /* Friday */
{
    printf ("Work at home today\n");
}

if (day == 6)          /* Saturday */
{
    printf ("Have a nice weekend\n");
}

if (day == 7)          /* Sunday */
{
    printf("Have a nice weekend\n");
}

```

Combining conditions

```
if ((day == 1) || (day == 5))          /* Monday, Friday */
{
    printf ("Work at home today\n");
}

if ((day == 2) || (day == 4))          /* Tuesday, Thursday */
{
    printf ("CSci 49, 12:45 AM - 2:00 PM\n");
    printf ("CSci 133, 2:20 - 3:35 PM\n");
    printf ("Office hours, 4:30 - 6:00 PM\n");
}

if (day == 3)                          /* Wednesday */
{
    printf ("Office hours, 2 - 5:30 PM\n");
}

if ((day == 6) || (day == 7))          /* Saturday, Sunday */
{
    printf ("Have a nice weekend\n");
}
```

Nested if Statements

```
if ((day == 1) || (day = 5))          /* Monday, Friday */
{
    printf ("Work at home today\n");
}
else
{
    if ((day == 2) || (day == 4))     /* Tuesday, Thursday */
    {
        printf ("CSci 49, 12:45 AM - 2:00 PM\n");
        printf ("CSci 133, 2:20 - 3:35 PM\n");
        printf ("Office hours, 4:30 - 6:00 PM\n");
    }
    else
    {
        if (day == 3)                 /* Wednesday */
        {
            printf ("Office hours, 2 - 5:30 PM\n");
        }
        else
        {
            if ((day == 6) || (day == 7)) /* Saturday, Sunday */
            {
                printf ("Have a nice weekend\n");
            }
            else                       /* none of the above */
            {
                printf ("Out of range input; try again")
            }
        }
    }
}
}
```

Simplifying Nested if Statements a Different Formatting Style

```
if ((day == 1) || (day == 5))          /* Monday, Friday */
{
    printf ("Work at home today\n");
}
else if ((day == 2) || (day == 4))     /* Tuesday, Thursday */
{
    printf ("CSci 49, 12:45 AM - 2:00 PM\n");
    printf ("CSci 133, 2:20 - 3:35 PM\n");
    printf ("Office hours, 4:30 - 6:00 PM\n");
}
else if (day == 3)                     /* Wednesday */
{
    printf ("Office hours, 2 - 5:30 PM\n");
}
else if ((day == 6) || (day == 7))     /* Saturday, Sunday */
{
    printf ("Have a nice weekend\n");
}
else                                    /* none of the above */
{
    printf ("Out of range input; try again")
}
}
```

Switch Statements

```
switch(day)
{
  case 1:
  case 5:                                /* Monday, Friday */
    printf ("Work at home today\n");
    break;    /* jump to bottom of switch statement

  case 2:
  case 4:                                /* Tuesday, Thursday */
    printf ("CSci 49, 12:45 AM - 2:00 PM\n");
    printf ("CSci 133, 2:20 - 3:35 PM\n");
    printf ("Office hours, 4:30 - 6:00 PM\n");
    break;

  case 3:                                /* Wednesday */
    printf ("Office hours, 2 - 5:30 PM\n");
    break;

  case 6:
  case 7:                                /* Saturday, Sunday */
    printf ("Have a nice weekend\n");
    break;

  default:                               /* anything else */
    printf("Bad input\n");
}
```

Use Constants, Not "Magic Numbers"

```
const int MON = 1, TUE = 2, WED = 3, THU = 4;
const int FRI = 5, SAT = 6, SUN = 7;
...
switch(day)
{
  case MON:
  case FRI:                                /* Monday, Friday */
    printf ("Work at home today\n");
    break;    /* jump to bottom of switch statement

  case TUE:
  case THU:                                /* Tuesday, Thursday */
    printf ("CSci 49, 12:45 AM - 2:00 PM\n");
    printf ("CSci 133, 2:20 - 3:35 PM\n");
    printf ("Office hours, 4:30 - 6:00 PM\n");
    break;

  case WED:                                /* Wednesday */
    printf ("Office hours, 2 - 5:30 PM\n");
    break;

  case SAT:
  case SUN:                                /* Saturday, Sunday */
    printf ("Have a nice weekend\n");
    break;

  default:                                  /* anything else */
    printf("Bad input\n");
}
```