In[217]:=
```
f = Function[{days, bprice, mprice},
  (* Initialize sizes *)
  rows = 2 * days + 1; (* one extra to disable use of macs on weekends *)
  cols = 4 * days; (* redundant variables, oh well, way easier to index *)
  A = Table[0, {i, 1, rows}, {j, 1, cols}];
  b = Table[{0, 0}, {i, 1, rows}];
  c = Table[0, {i, 1, cols}];
  u = {110, 100, 160, 120, 180, 200, 120};

  (* Build A *)
  (* b_i @ [row, i] 'bought' *)
  (* l_i @ [row, days + i] 'leftover' *)
  (* o_i @ [row, (2*days) + i] 'one-day started on' *)
  (* t_i @ [row, (3*days) + i] 'two-day started on' *)
  For[i = 1, i ≤ days, i++,
   ix = (i - 1) * 2 + 1;
   weekend = Mod[i, 7] == 0 || Mod[i + 1, 7] == 0;
   needed = u[[Mod[i - 1, 7] + 1]];

   A[[ix, i]] = 1; (* b_i *)
   jx = (2 * days) + i - 2;
   A[[ix, jx]] = If[i ≥ 3, 1, A[[ix, jx]]]; (* o_(i-2) *)
   jx = (3 * days) + i - 3;
   A[[ix, jx]] = If[i ≥ 4 , 1, A[[ix, jx]]]; (* t_(i-3) *)

   A[[ix + 1, days + i]] = 1; (* l_i *)
   jx = days + i - 1;
   A[[ix + 1, jx]] = If[i > 1, -1, A[[ix + 1, jx]]]; (* l_(i-1) *)
   A[[ix + 1, (2 * days) + i]] = 1; (* o_i *)
   A[[ix + 1, (3 * days) + i]] = 1; (* t_i *)

   (* disable macs on weekends *)
   A[[rows, (3 * days) + i]] = If[weekend, 1, 0];

   (* Build b *)
   b[[ix]] = {needed, 1};
   b[[ix + 1]] = {needed, -1};

   (* Build c *)
   c[[i]] = 8;
   c[[2 * days + i]] = bprice;
   c[[3 * days + i]] = mprice;
  ];

  b[[rows]] = {0, 0}; (* magic constraint to disable macs on weekends *)

  xsol = LinearProgramming[c, A, b];

  Print["total cost: $", c.xsol];
  buy = "buy (";
  buds = "buds (";
  macs = "macs (";
  For[i = 1, i ≤ days, i++,
   buy = buy <> ToString[xsol[[i]]] <> If[i ≠ days, ", ", ")"];
   buds = buds <> ToString[xsol[[(2 * days) + i]]] <> If[i ≠ days, ", ", ")"];
   macs = macs <> ToString[xsol[[(3 * days) + i]]] <> If[i ≠ days, ", ", ")"];
  ];
  Print[buy];
  Print[buds];
  Print[macs];

  xsol.c
 ];
```

In[218]:=
```
(* 7 days, normal pricing *)
f[7, 3, 1]
```

```
total cost: $4290

buy (110, 100, 160, 10, 0, 0, 0)

buds (0, 0, 80, 120, 120, 0, 0)

macs (110, 100, 80, 0, 0, 0, 0)
```

Out[218]= 4290

In[219]:=
```
(* 30 days, normal pricing *)
f[30, 3, 1]
```

```
total cost: $9430

buy (110, 100, 160, 10, 80, 40, 0, 0, 0,
  0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)

buds (0, 0, 0, 0, 0, 0, 100, 160, 0, 0, 0, 0,
  0, 100, 160, 0, 0, 0, 0, 0, 100, 160, 0, 0, 0, 0, 0, 100, 0, 0)

macs (110, 100, 160, 120, 110, 0, 0, 120, 180, 200, 120, 110,
  0, 0, 120, 180, 200, 120, 110, 0, 0, 120, 180, 200, 120, 110, 0, 0, 0, 0)
```

Out[219]= 9430

In[220]:=
```
(* 30 days different pricing *)
f[30, 3 / 2, 1]
```

```
total cost: $7960

buy (110, 100, 160, 10, 50, 0, 0, 0, 0,
  0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0)

buds (0, 0, 30, 70, 70, 0, 100, 160, 0, 30, 70, 70,
  0, 100, 160, 0, 30, 70, 70, 0, 100, 160, 0, 30, 70, 70, 0, 100, 0, 0)

macs (110, 100, 130, 50, 110, 0, 0, 120, 150, 130, 50, 110,
  0, 0, 120, 150, 130, 50, 110, 0, 0, 120, 150, 130, 50, 110, 0, 0, 0, 0)
```

Out[220]= 7960