Summer Session II 2013
EECS 10 Week3 Discussion2

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Outline

- Assignment 3 Part2
  - Blackjack (30pts)
  - Bonus (5pts)
- Concept review: Function

ASSIGNMENT DISCUSSION

- Assignment 3, Part 2
  - Before you implement your work, review lecture slides about repetition structure and jump structure.
  - Read the assignment handout carefully
- Blackjack (30 pts)
  - Good exercise for control flow
  - What is the input? What is the output?
  - What algorithm to solve this problem?
  - What is the control flow for this program?
  - How to implement this program?

BLACKJACK

- (our) rules:
  - Points can not be more than 21
  - Player's round :
    - Player gets a card (A, 2~10, J, Q, K)
      A = 1 pt, J / Q / K = 10 pts
    - Player decides to asking for another card or not
  - Dealer's round :
    - Dealer draws card(s)
    - If dealer's point is equivalent to player's point, dealer wins.
    - If dealer's point is more than user's point, dealer wins.
    - If dealer's point is over 21 points, dealer loses.

BLACKJACK

- What is the input ? What is the output ?
  - Drawing card or not
- What is the algorithm to solve problem?
  - Accumulation and comparison
- What is the control flow?
  - What is the condition(s) to terminate the repetition structure?
  - for-loop? while-loop?
- How to implement the program?
  - How to implement the behavior of drawing random card ?
  - …

RANDOM FUNCTION

- Random function: rand(), srand()
- Example :

```
#include <stdio.h>
#include <stdlib.h>     /* for rand() and srand() */
#include <time.h>       /* for time() */

int main(void)
{
  /*variable declaration*/
  ...
  srand(time(NULL)) ;    /*initialization*/
  ...
  card = (rand()%13) + 1 ; /*draw a random card*/
                           /*J = 11, Q = 12, K = 13*/
  card = (card > 10)? 10 : card ;
  ...
```

ASSIGNMENT DISCUSSION

- Bonus - make your blackjack more real
  - An ace card (1) could be either 1 or 11 for best interest.
  - The decision can only be made once while the card is issued.
- Briefly describe the control flow for your Blackjack program in txt file
- Name your files **blackjack.c**, **blackjack.txt** and **blackjack.script.**

CONCEPT REVIEW: FUNCTION

- Important programming concepts
- C programming language distinguishes 3 constructs around functions:
  - Function declaration
    - Declaration of function name, parameters, and return type.
  - Function definition
    - Extension of a function declaration with a function body
    - Function declaration + function behavior
  - Function call
    - Invocation of a function
    - Supply argument for formal parameters

EXAMPLE : DRAWING A CARD IN BLACKJACK

- Example :

```
#include <stdio.h>
#include <stdlib.h>     /* for rand() and srand() */
#include <time.h>       /* for time() */

int main(void)
{
  /*variable declaration*/
  ...
  srand(time(NULL)) ;    /*initialization*/
  ...
  card = (rand()%13) + 1 ; /*draw a random card*/
                           /*J = 11, Q = 12, K = 13*/
  card = (card > 10)? 10 : card ;
  ...
```

EXAMPLE : DRAWING A CARD IN BLACKJACK

- Drawing a random card
  - Return a card with pts from 1~10
- Function declaration
  - Input argument? none
  - Output argument? Card (of type integer)
  - `Int card_drawing (void)`

EXAMPLE : DRAWING A CARD IN BLACKJACK

- Function definition
  - What is the functionality of the function you want to define?
    - Generate a random value within range 1~13
    - Covert 11(jack), 12(queen), 13(king) to 10 pts

```
Int card_drawing (void)
{
      int card ;
      card = (rand()%13) + 1 ;
      card = (card > 10)? 10 : card ;
      return card ;
}
```

EXAMPLE : DRAWING A CARD IN BLACKJACK

- Function call

```
#include <stdio.h>
#include <stdlib.h>     /* for rand() and srand() */
#include <time.h>               /* for time() */


int main(void)
{
  /*variable declaration*/
  ...
  srand(time(NULL)) ;    /*initialization*/
  ...
  card = (rand()%13) + 1 ; /*draw a random card*/
                           /*J = 11, Q = 12, K = 13 */
  card = (card > 10)? 10 : card ;
  ...
```

EXAMPLE : DRAWING A CARD IN BLACKJACK

- Function call

```
#include <stdio.h>
#include <stdlib.h>     /* for rand() and srand() */
#include <time.h>               /* for time() */
int card_drawing(void)
{...}
int main(void)
{
  /*variable declaration*/
  ...
  srand(time(NULL)) ;    /*initialization*/
  ...
  card = card_drawing() ;
  ...
```

EXAMPLE : BLACKJACK

```
int main (void)
{
  while(...)
  {
    card = ...
    if (...)
    {
      ...
    }
    ...
  }
  ...
  while(...)
  {
    card = ...
    if (...)
    {
      ...
    }
    ...
  }
  ...
}
```

```
int player_round (...)
{
  while(...)
  {...}
  return ... ;
}

 int dealer_round (...)
{
  while(...)
  {...}
  return ... ;
}

int main (void)
{
  p_pts = player_round(...) ;

  d_pts = dealer_round(...) ;

  if (p_pts>d_pts)
  {...}
  return 0 ;
}
```