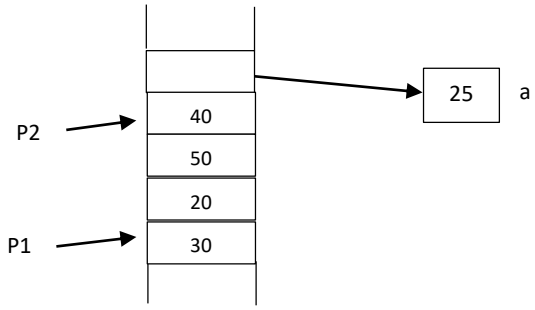
QUESTION 1) [15 points]



QUESTION 2) [10 points]

```
#include <stdio.h>

int main()
{
  int r ;    // radius of a circle
  int x, y;  // point coordinates

  printf("Enter radius of a circle : ");
  scanf("%d ", &r);

  printf("Enter x, y values of a point : ");
  scanf("%d %d", &x, &y);

  if (x*x + y*y < r*r)
    printf("The point lies inside the circle.\n");
  else
    if (x*x + y* y > r*r)
      printf("The point lies outside the circle.\n");
    else
      printf("The point lies on the circle.\n");
}
```

QUESTION 3) [25 points]

```
#include <stdio.h>

int main()
{
  char name[10];
  int amount, Max = -9999;
  float factor;
  int N,i;
  FILE *fp;

  fp = fopen("ITEMS.TXT","r");

  // Read the file to find the biggets amount.
  while (!feof(fp))
  {
    // Read a record
    fscanf(fp, "%s %d", name,  &amount);
    if (fp == NULL) break;

    if (amount > Max)
      Max = amount;
   }

  factor = 50.0 / Max;
  rewind(fp);

  printf("HISTOGRAMS OF ITEMS \n");

  // Read the file again for histograms.
  while (!feof(fp))
  {
    // Read a record
    fscanf(fp, "%s %d", name,  &amount);
    if (fp == NULL) break;

    N = amount * factor;

    printf("%s\t%d\t", name, amount);

    for (i=1; i<=N; i++)
        printf("*");

    printf("\n");
   }

  fclose(fp);
}
```

QUESTION 4) [25 points]

```
#include <stdio.h>
#include <ctype.h>

int main()
{
  char x;
  char string[100];
  int N,i,j;

  printf("Enter a sentence : ");
  gets(string);

  N = strlen(string);

  for (i=0; i < N; i++)
  {
     x = tolower(string[i]);
     if  (x == 'a' || x == 'e' || x == 'o' || x == 'u' || x == 'i')
     {

        // Shift characters to left
        for (j=i; j < N-1; j++)
             string[j] = string[j+1];

        string[N-1] = '\0'; // Add a null to the end

        x = tolower(string[i]);
       if  (x == 'a' || x == 'e' || x == 'o' || x == 'u' || x == 'i')
            i--;
     }
  }

  printf("%s\n", string);
}
```

QUESTION 5) [25 points]

```
//Convert the user inputs into a time expressed in total minutes since midnight,
//and compare it to the departure times in matrix, also expressed in total minutes since 00:00 o'clock.

#include <stdio.h>
#define N 8  // Array size

int main()
{
int time[N][2] = { {8, 0},  {9, 43},  {11, 19},  {12, 47},  {14, 0},  {15, 45},  {19, 0},  {21, 45} };

int hour, minute;              // User inputs
int user_total_minutes;   // Total minutes of user inputs

int diff;                  // Difference
int EK_diff = 9999;   // Smallest difference
int EK_index;          // Index of smallest difference
int total_minutes;    // Total minutes of departure time
int i;                      // Loop counter

printf("Enter a 24-hour time (in hh mm format): ");
scanf("%d %d", &hour, &minute);
user_total_minutes = hour * 60 + minute;

for (i=0; i<N; i++)
{
  total_minutes = time[i][0] * 60 + time[i][1];
  diff = fabs(total_minutes - user_total_minutes);

  if (diff < EK_diff)
  {
      EK_diff = diff;
      EK_index = i;
  }
}

printf("Closest departure time is %02d:%02d \n", time[EK_index][0], time[EK_index][1]);
}
```